

From the Nation's Leader in GMAT Preparation

GMAT CRITICAL REASONING BIBLE

*A Comprehensive System for
Attacking the GMAT
Critical Reasoning Questions*

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POWERSCORE®

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About PowerScore

PowerScore is one of the world's fastest growing test preparation companies. Headquartered on Hilton Head Island in South Carolina, PowerScore offers GMAT, GRE, LSAT, and SAT preparation classes in over 75 locations in the U.S. and abroad. For more information, please visit our website at www.powerscore.com.

C H A P T E R O N E : I N T R O D U C T I O N

Introduction

Welcome to the *PowerScore GMAT Critical Reasoning Bible*. We congratulate you on your savvy purchase—you have bought the most advanced book ever published for the GMAT Critical Reasoning section. The purpose of this book is to provide you with a powerful and comprehensive system for attacking the Critical Reasoning section of the Graduate Management Admission Test (GMAT), and by thoroughly studying and correctly applying this system we are confident you will increase your Critical Reasoning score.

This book has been carefully designed to reinforce your understanding of the concepts behind the Critical Reasoning section. The concepts and techniques discussed herein are drawn from our live GMAT courses, which we feel are the most effective in the world.

In order to apply our methods effectively and efficiently, we strongly recommend that you carefully read and re-read each of the discussions regarding arguments, concepts, and question types. We also suggest that as you finish each question you look at both the explanation for the correct answer choice and the explanations for the incorrect answer choices. Closely examine each problem and determine which elements led to the correct answer, and then study the analyses provided in the book and check them against your own work. By doing so you will greatly increase your chances of recognizing the patterns present in all Critical Reasoning questions.

This book also contains a variety of drills and exercises that supplement the discussion of techniques and question analysis. The drills help strengthen specific skills that are critical for GMAT excellence, and for this reason they are as important as the questions. In the answer keys to these drills we will often introduce and discuss important GMAT points, so we strongly advise you to read through all explanations.

On page 299 there is a complete quick-reference answer key to all problems in this book. The answer key contains a legend of question identifiers, as well as chapter-by-chapter answer keys.

Because access to accurate and up-to-date information is critical, we have devoted a section of our website to *Critical Reasoning Bible* students. This free online resource area offers supplements to the book material, answers questions posed by students, offers study plans, and provides updates as needed. There is also an official book evaluation form that we strongly encourage you to use.

The exclusive *GMAT Critical Reasoning Bible* online area can be accessed at:

www.powerscore.com/crbible

If we can assist you in your GMAT preparation in any way, or if you have any questions or comments, please do not hesitate to contact us via email at crbible@powerscore.com. Additional contact information is provided at the end of this book. We look forward to hearing from you!

A Brief Overview of the GMAT

The Graduate Management Admission Test is required for admission at over 1000 business schools worldwide. According to the Graduate Management Admission Council (GMAC), the makers of the test, "The GMAT is specifically designed to measure the verbal, quantitative, and writing skills of applicants for graduate study in business. It does not, however, presuppose any specific knowledge of business or other specific content areas, nor does it measure achievement in any particular subject areas." The GMAT is given in English, and consists of the following four separately timed sections:

- **Analytical Writing Assessment.** 2 essays, 30 minutes each; one essay asks for an analysis of an issue, the other asks for an analysis of an argument.
- **Quantitative Section.** 37 multiple-choice questions, 75 minutes; two question types: Problem Solving and Data Sufficiency.
- **Verbal Section.** 41 multiple-choice questions, 75 minutes; three question types: Reading Comprehension, Critical Reasoning, and Sentence Correction.

An optional break of 5 minutes is allowed between each section, and so the order of the test sections is always identical:

Analytical Writing Assessment

Analysis of an Issue	30 minutes	1 question
Analysis of an Argument	30 minutes	1 question

Break 5 minutes

Quantitative Section

Data Sufficiency	75 minutes	37 questions
Problem Solving		

Break 5 minutes

Verbal Section

Critical Reasoning	75 minutes	41 questions
Reading Comprehension		
Sentence Correction		

When you take an actual GMAT, you must present an ID. This is done in case of test security problems.

Although the 5-minute breaks are optional, you should always take the entire break time in order to avoid fatigue.

The Analytical Writing Assessment

The Analytical Writing Assessment (AWA) appears at the beginning of the GMAT, immediately after the computer tutorial. The AWA consists of two essays, and you have thirty minutes to complete each essay. There is no break between the two sections. The two essay topics are Analysis of an Argument and Analysis of an Issue.

The AWA was developed in 1994 in response to requests from business schools to add a writing component to the GMAT. Studies had shown that strong writing and communication abilities are critical for strong business performance, and business schools wanted to have a means of assessing candidates' communication abilities. According to GMAC, "The AWA is designed as a direct measure of your ability to think critically and to communicate your ideas. More specifically, the Analysis of an Issue task tests your ability to explore the complexities of an issue or opinion and, if appropriate, to take a position informed by your understanding of those complexities. The Analysis of an Argument task tests your ability to formulate an appropriate and constructive critique of a specific conclusion based upon a specific line of thinking."

Each Analytical Writing Assessment essay is initially scored on a 0 to 6 scale in half-point increments by two readers—one human reader, and one machine reader, the "e-rater." The two scores are averaged to produce a final score for each essay. The final score of each essay are then averaged together to create an overall score on a scale from 0 to 6, in half-point increments.

The Quantitative Section

The Quantitative section of the GMAT is comprised of questions that cover mathematical subjects such as arithmetic, algebra, and geometry. There are two question types—Problem Solving and Data Sufficiency.

Problem Solving questions contain five separate answer choices, each of which offers a different solution to the problem. Approximately 22 of the 37 Quantitative section questions will be in the Problem Solving format.

Data Sufficiency questions consist of a question followed by two numbered statements. You must determine if the numbered statements contain sufficient information to solve the problem—individually, together, or not at all. Each Quantitative section contains approximately 15 Data Sufficiency questions, and this type of problem is unique to the GMAT and can be exceptionally challenging.

At the conclusion of the GMAT you have the option to cancel your score. Unfortunately, there is no way to determine exactly what your score would be before cancelling.

If you choose to accept your score, the results of your test (excluding the Writing scores) are available immediately.

The Verbal Section

The GMAT Verbal section is a test of your ability to read for content, analyze argumentation, and to recognize and correct written errors. Accordingly, there are three types of problems—Reading Comprehension, Critical Reasoning, and Sentence Correction.

Reading Comprehension questions examine your ability to analyze large amounts of material for content and understanding. Passages range up to 350 words in length, and each passage is accompanied by 3 to 8 questions. Passage topics are drawn from a variety of areas, including business, science, politics, law, and history.

Critical Reasoning questions present a short argument followed by a question such as: “Which of the following weakens the argument?” “Which of the following parallels the argument?” or “Which of the following must be true according to the argument?” The key to these questions is understanding the reasoning types and question types that frequently appear. Within the Verbal Section you will encounter approximately 10 to 14 Critical Reasoning questions.

Critical Reasoning has been on the GMAT since 1988.

Each Sentence Correction problem presents a sentence containing an underlined section. Five answer choices follow the problem, and each suggests a possible phrasing of the underlined section. The first answer choice is a repeat of the underlined section, and the remaining four answers are different than the original. Your task is to analyze the underlined section and determine which of the answers offers the best phrasing.

Experimental Questions

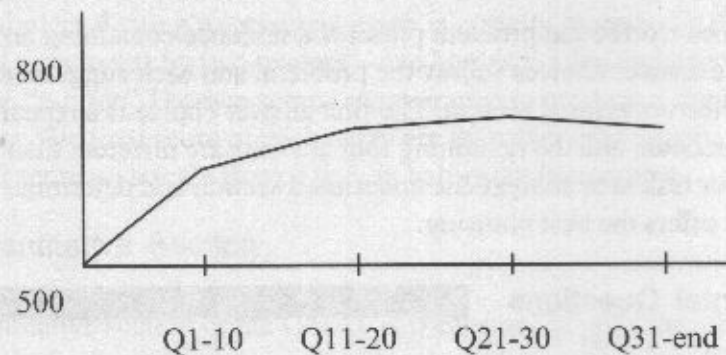
During the GMAT you will encounter questions that will not contribute to your score. These questions, known as “experimental” questions, are used on future version of the GMAT. Unfortunately, you will not be informed during the test as to which questions do not count, so you must give your best performance on each question.

About 1/4 of the questions on the GMAT are experimental, with the questions roughly split between the Quantitative and Verbal sections.

The GMAT CAT Format

As opposed to the traditional paper-and-pencil format used by many other tests, the GMAT is administered on a computer. Consequently, only one question at a time is presented, the order of questions is not predetermined, and the test actually responds to your answers and shapes the exam in order to most efficiently arrive at your proper score. This format is known as a Computer Adaptive Test, or CAT.

For example, the first question in the Verbal or Quantitative section will be a medium difficulty question. If answered correctly, the computer will supply a somewhat harder question on the assumption that your score is somewhere above that level. If this next question is answered correctly, the following question will again be more difficult. This process continues until a question is missed. At that point, the test will supply a somewhat easier question as it tries to determine if you have reached your score "ceiling." By increasing or decreasing the difficulty of the questions based on prior response, the test attempts to quickly pinpoint your appropriate score level and then confirm that level. Consequently, the first several questions are used to broadly establish your general scoring range:



In the diagram above, correct responses to the first several questions lead to significant jumps in score, whereas later questions make smaller adjustments. A strong beginning followed by a weak finish will produce a higher score than a weak beginning followed by a strong finish. For this reason it is essential that your performance early in the section be as strong as possible, even if this requires using more than the average time allotted per question.

Special GMAT CAT Considerations

The CAT format has certain features that appreciably alter the testing experience:

- The CAT format does not allow you to “skip” a question; that is, you cannot leave a question blank nor can you come back to a question. In order to move forward in the test you *must* answer the question on the screen. If you do not know the answer, you must make an educated guess. And since the test adapts to your previous responses, once you complete a question, you cannot return to that question.
- You cannot write on the computer screen, but scratch paper is available and should be used (more on this in a moment).
- Facility with a computer is clearly an advantage; fast typing is also an advantage in the Analytical Writing Sections where your response must be typed into the computer.
- The test penalizes examinees who do not finish all the questions in the section. Thus, since the number of questions answered is incorporated into the calculation of scores, it is essential that you complete every question in each section. There is a strong penalty for leaving questions unanswered, and so it is better to miss a question than to leave it unanswered.
- The results of your test (excluding the Writing scores) are available at the conclusion of the exam.

Question Difficulty Matters

Complicating the GMAT CAT scoring system is that question difficulty affects your overall score. Each question is assigned a predetermined “weight,” and more difficult questions have a greater weight. Consequently, it is important that you answer difficult questions and not just “skip” any question that appears difficult. Answering fifteen easy questions will produce a lower score than answering fifteen difficult questions.

General Pacing

Since completing every question in a section is critical, pacing is equally important. Based purely on the number of questions and the total time per section, the following lists average amount of time you can spend per question:

Quantitative Section: 37 questions, 75 minutes
Average time per question: *2 minutes, 1 second*

Verbal Section: 41 questions, 75 minutes
Average time per question: *1 minute, 49 seconds*

Score-Specific Pacing

The following references provide alternate pacing strategies depending on desired score.

Basic Quantitative Strategy for various scoring ranges:

700-800: Complete every question, average of just under 2 minutes per question

600-690: Attempt to complete every question, average of 2 minutes, 15 seconds per question, keep enough time to guess on uncompleted questions

500-590: Attempt to complete at least 75% of questions, average of 2 minutes, 35 seconds per question, keep enough time to guess on uncompleted questions

Basic Verbal Strategy for various scoring ranges:

700-800: Complete every question, average of 1 minute, 45 seconds per question

600-690: Attempt to complete every question, average of 2 minutes per question, keep enough time to guess on uncompleted questions

500-590: Attempt to complete at least 75% of questions, average of 2 minutes, 20 seconds per question, keep enough time to guess on uncompleted questions

However, since the questions at the start of each section are more critical than later questions, a greater amount of time than the average can be allotted to the early questions, and then the pace can be accelerated as the sections proceeds.

Timing Your Practice Sessions

One of the most important tools for test success is a timer. When working with paper tests or the *Official Guide for GMAT Review*, your timer should be a constant companion during your GMAT preparation.

Although not all of your practice needs to be timed, you should attempt to do as many questions as possible under timed conditions. Time pressure is the top concern cited by test takers, and practicing with a timer will help acquaint you with the challenges of the test. After all, if the GMAT was a take-home test, no one would be too worried about it.

When practicing with a timer, keep notes about how many questions you complete in a given amount of time. You should vary your approach so that practice does not become boring. For example, you could track how long it takes to complete 3, 5, or 8 questions. Or you could see how many questions you can complete in 6 or 10 minutes. Trying different approaches will help you get the best sense of how fast you can go while still maintaining a high degree of accuracy.

Excellent silent countdown timers can be purchased through our website at powerscore.com.

A timer is invaluable because it is both an odometer and speedometer for your practice. With sufficient practice you will begin to establish a comfortable Critical Reasoning speed and the timer allows you to make sure you are maintaining this pace. Whether you use a watch, stopwatch, or kitchen timer is irrelevant; just make sure you time yourself rigorously.

Computers and Scratch Paper

Taking a standardized test on a computer is an unusual experience. The natural tendency to mark up the page is thwarted since you cannot write on the computer screen. Consequently, using scratch paper is an important aid to smooth test performance. Several sheets of scratch paper will be supplied by the test administrator, and more sheets can be requested during the exam.

During the pre-test tutorial, use part of the scratch paper to quickly draw out the following chart:

A									
B									
C									
D									
E									

As you progress through each question, you can use the chart to keep track of eliminated answer choices as is necessary. For example, if you are certain answer choices (A) and (C) are incorrect in problem #2, simply "X" them out on the chart:

	2								
A	X								
B									
C	X								
D									
E									

In this fashion you can overcome the inability to physically mark out answer choices on the computer screen.

You should also familiarize yourself with GMAT CAT computer controls since computer aptitude is clearly an advantage. Although the test is given on standard computers, the GMAT CAT program does not allow the use of certain keys, such as the "tab" key. *The Official Guide for GMAT Review* contains a detailed explanation of the GMAT CAT computer controls, and the free GMATPrep Software contains test tutorials to help you gain experience with the computer controls. In addition, in the Analytical Writing Sections, your typing ability affects overall performance, and thus you must have at least basic typing skills.

The GMAT may switch to a "no scratch paper allowed" policy in the near future. If this occurs, test takers will be given small erasable "whiteboards" that will serve the same function as scratch paper. You will be able to use the same techniques described here on the personal whiteboards.

The GMAT Scoring Scale

Every GMAT score report contains four sections:

- A Quantitative Score—on a scale of 0 to 60
- A Verbal Score—on a scale of 0 to 60
- A Total Score—on a scale of 200 to 800
- An Analytical Writing Assessment Score—on a scale of 0 to 6

The Quantitative and Verbal scores are section scores, and these two section scores are combined to create the Total Score. The Total Score is the one most familiar to GMAT test takers, and it is given on the famous 200 to 800 scale, with 200 being the lowest score and 800 the highest score.

Each Analytical Writing Assessment essay is initially scored on a 0 to 6 scale by two readers—one human reader, and one machine reader, the “E-rater.” The two scores are averaged to produce a final score for each essay. The final scores of each essay are then averaged together to create an overall score.

Approximately 90% of all test takers receive a score of 3 or higher. Your AWA score has no effect on your Total Score.

The GMAT Percentile Table

It is important not to lose sight of what the GMAT Total Score actually represents. The 200 to 800 test scale contains 61 different possible scores. Each score places a student in a certain relative position compared to other test takers. These relative positions are represented through a percentile that correlates to each score. The percentile indicates where the test taker ranks in the overall pool of test takers. For example, a score of 680 represents the 90th percentile, meaning a student with a score of 680 scored better than 90 percent of the people who have taken the test in the last two years. The percentile is critical since it is a true indicator of your positioning relative to other test takers, and thus business school applicants.

Charting out the entire percentage table yields a rough “bell curve.” The number of test takers in the 200s and 700s is very low (only 7% of all test takers receive a score in the 700s; only 2% in the 200s), and most test takers are bunched in the middle, comprising the “top” of the bell. In fact, approximately 30% of all test takers score between 450 and 550 inclusive, and about 60% of all test takers score between 400 and 600 inclusive.

The median score on the GMAT scale is 540. The median, or middle, score is the score at which approximately 50% of test takers have a lower score and 50% of test takers have a higher score.

It is important to remember that you do not have to answer every question correctly in order to receive an excellent GMAT score. There is room for error, and accordingly you should never let any single question occupy an inordinate amount of your time.

The Use of the GMAT

The use of the GMAT in business school admissions is not without controversy. Experts agree that your GMAT score is one of the most important determinants of the type of school you can attend. At many business schools an "admissions index" consisting of your GMAT score and your undergraduate grade point average is used to help determine the relative standing of applicants, and at some schools a sufficiently high admissions index virtually guarantees your admission.

For all the importance of the GMAT, the exam is not without flaws. As a standardized test currently given in the computer adaptive format there are a number of skills that the GMAT cannot measure, including listening skills, note-taking ability, perseverance, etc. GMAC is aware of these limitations and on a regular basis they warn all business school admission offices about using the GMAT scores as the sole admission criterion. Still, because the test ultimately returns a number for each student, the tendency to rank applicants is strong. Fortunately, once you get to business school the GMAT is forgotten. For the time being consider the test a temporary hurdle you must leap in order to reach the ultimate goal.

For more information on the GMAT, or to register for the test, contact the Graduate Management Admission Council at (800) 462-8669 or at their website at www.mba.com.

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HAPTER TWO: THE BASICS OF CRITICAL REASONING

GMAT Critical Reasoning

The focus of this book is on GMAT Critical Reasoning, and each Verbal section contains a total of 10 to 14 Critical Reasoning questions. When the total time allotted is weighed against the total number of questions in the Verbal section, you have an average of approximately one minute and forty-five seconds to complete each question. Of course, the amount of time you spend on each question will vary with the difficulty of each question. For virtually all students the time constraint is a major obstacle, and as we progress through this book we will discuss time-saving techniques that you can employ within the section.

On average, you have 1 minute and 45 seconds to complete each question.

Critical Reasoning Question Directions

The directions for Critical Reasoning problems are short and seemingly simple:

"For this question type, select the best of the given answer choices."

Because these directions always precede first Critical Reasoning question in a Verbal section, you should familiarize yourself with them now. Once the GMAT begins, *never* waste time reading the question directions in any section.

Let's examine the directions more closely. Consider the following phrase: "select the best of the answer choices given." By stating up front that answers have comparative value and some are better than others, the makers of the test compel you to read every single answer choice before making a selection. If you read only one or two answer choices and then decide you have the correct one, you could end up choosing an answer that has some merit but is not as good as a later answer. One of the test makers' favorite tricks is to place a highly attractive wrong answer choice immediately before the correct answer choice in the hopes that you will pick the wrong answer choice and then move to the next question without reading any of the other answers.

Always read each of the five answer choices before deciding which answer is correct.

What is notable about the directions is what is *not* stated. No mention is made of whether to accept all statements as true, nor is any comment made about what you should assume about each question. A bit later in this chapter we will address the truth of the statements in each passage, but let's take a moment to talk about the assumptions that underlie each problem. In general, standardized tests such as the GMAT operate on "commonsense" grounds; that is, you should only assume things that would be considered common sense or widely known to the general public. The implication is that you can make some assumptions when working with questions, but not other assumptions. Of course, the GMAC does not hand out a list of what constitutes a reasonable

Assumptions are a critical part of GMAT Critical Reasoning, and we will talk about assumptions in more detail in a later chapter.

Here's a good example of what they expect you to assume: when "television" is introduced in a stimulus, they expect you to know, among other things, what a TV show is, that TV can portray the make-believe or real, what actors do, and that TV is shown by beaming signals into TV sets in homes and elsewhere.

The question to the right is presented for demonstration purposes only. For those of you who wish to try the problem now, the correct answer is listed in the first sidebar on the next page.

assumption! Even outside of the GMAT, the test makers do not clearly state what assumptions are acceptable or unacceptable for you to make, mainly because such a list would be almost infinite. For GMAT purposes, approaching each question you can take as true any statement or idea that an average person would be expected to believe on the basis of generally known and accepted facts. For example, in a question you can assume that the sky sometimes becomes cloudy, but you cannot assume that the sky is always cloudy (unless stated explicitly by the question). GMAT questions will *not* require you to make assumptions based on extreme ideas (such as that it always rains in Seattle) or ideas not in the general domain of knowledge (such as the per capita income of residents of France). Please note that this does not mean that the GMAT cannot set up scenarios where they discuss ideas that are extreme or outside the bounds of common knowledge. Within a Critical Reasoning question, the test makers can and do discuss complex or extreme ideas; in these cases, they will give you context for the situation by providing additional information. However, be careful about assuming something to be true (unless you believe it is a widely accepted fact or the test makers indicate you should believe it to be true). This last idea is one we will discuss in much more detail as we look at individual question types.

The Parts of a Critical Reasoning Question

Every Critical Reasoning question contains three separate parts: the stimulus, the question stem, and the five answer choices. The following diagram identifies each part:

1. Most serious students are happy students, and most _____ Stimulus
serious students go to graduate school. Furthermore,
all students who go to graduate school are
overworked.
- Which one of the following can be properly inferred _____ Question Stem
from the statements above?
- (A) Most overworked students are happy students.
(B) Some happy students are overworked.
(C) All overworked students are serious students. _____ Answer Choices
(D) Some unhappy students go to graduate school.
(E) All serious students are overworked.

As a technical note, on the GMAT CAT an empty answer bubble appears next to each answer, and there is no letter in the bubble. However, for the convenience of discussion, throughout this book we will present problems with the answer choices lettered (A) through (E).

Approaching the Questions

When examining the three parts, students sometimes wonder about the best strategy for attacking a question: should I read the question stem first? Should I preview the five answer choices? The correct answer is *Read the parts in the order given*. That is, first read the stimulus, then read the question stem, and finally read each of the five answer choices. Although this may seem like a reasonable, even obvious, approach we mention it here because some GMAT texts advocate reading the question stem before reading the stimulus. We are certain that these texts are seriously mistaken, and here are a few reasons why:

The correct answer to the problem on the previous page is answer choice (B).

1. Understanding the stimulus is the key to answering any question, and reading the question stem first tends to undermine the ability of students to fully comprehend the information in the stimulus. On easy questions this distraction tends not to have a significant negative impact, but on more difficult questions the student often is forced to read the stimulus twice in order to get full comprehension, thus wasting valuable time. Literally, by reading the question stem first, students are forced to juggle two things at once: the question stem and the information in the stimulus. That is a difficult task when under time pressure. The bottom line is that any viable strategy must be effective for questions at all difficulty levels, but when you read the question stem first you cannot perform optimally. True, the approach works with the easy questions, but those questions could have been answered correctly regardless of the approach used.
2. Reading the question stem first often wastes valuable time since the typical student will read the stem, then read the stimulus, and then read the stem again. Unfortunately, there simply is not enough time to read every question stem twice.
3. Some question stems refer to information given in the stimulus, or add new conditions to the stimulus information. Thus, reading the stem first is of little value and often confuses or distracts the student when he or she goes to read the stimulus.
4. On stimuli with two questions, reading one stem biases the reader to look for that specific information, possibly causing problems while doing the second question, and reading both stems before reading the stimulus wastes entirely too much time and leads to confusion.
5. For truly knowledgeable test takers there are situations that arise where the question stem is fairly predictable. One example—and there are others—is with a question type called Resolve the Paradox. Usually, when you read the stimulus that accompanies these questions, an obvious paradox or discrepancy is presented. Reading the question stem beforehand does not add anything to what you would have known just from reading the stimulus. In later chapters we will discuss this situation and others where you can predict the question stem with some success.

In our experience, the vast majority of high-scoring GMAT takers read the stimulus first.

6. Finally, we believe that one of the main principles underlying the read-the-question-stem-first approach is flawed. Many advocates of the approach claim that it helps the test taker identify and skip (by simply guessing instead of doing the question) the “harder” question types such as Parallel Reasoning or Method of Reasoning. However, test data show that questions of any type can be hard or easy. Some Parallel Reasoning questions are phenomenally easy whereas some Parallel Reasoning questions are extremely difficult. In short, the question stem is a poor indicator of difficulty because question difficulty is more directly related to the complexity of the stimulus and the corresponding answer choices.

Understandably, reading the question stem before the stimulus sounds like a good idea at first, but for the majority of students (especially those trying to score in the 600s and above), the approach is a hindrance, not a help. Solid test performance depends on your ability to quickly comprehend complex argumentation; do not make your task harder by reading the question stem first.

Analyzing the Stimulus

As you read the stimulus, initially focus on making a quick analysis of the topic under discussion. What area has the author chosen to write about? You will be more familiar with some topics than with others, but do not assume that everything you know “outside” of the stimulus regarding the topic is true and applies to the stimulus. For example, say you work in a real estate office and you come across a GMAT question about property sales. You can use your work experience and knowledge of real estate to help you better understand what the author is discussing, but do not assume that things will operate in the stimulus exactly as they do at your workplace. Perhaps property transactions in your state are different from those in other states, or perhaps protocols followed in your office differ from those elsewhere. In a GMAT question, look carefully at what the author says about the topic at hand; statements presented as facts on the GMAT can and do vary from what occurs in the “real world.” This discrepancy between the “GMAT world” and the “real world” is one you must always be aware of: although the two worlds overlap, things in the GMAT world are often very different from what you expect. From our earlier discussion of commonsense assumptions we know that you can assume that basic, widely-held facts will hold true in the GMAT world, but by the same token, you cannot assume that specialized information that you have learned in the real world will hold true on the GMAT. We will discuss “outside information” in more detail when we discuss GMAT question types.

Next, make sure to read the entire stimulus very carefully. The makers of the GMAT have extraordinarily high expectations about the level of detail you should retain when you read a stimulus. Many questions will test your knowledge of small, seemingly nitpicky variations in phrasing, and reading carelessly is GMAT suicide. In many respects, the requirement forced upon you

Reading closely is
a critical GMAT
skill.

to read carefully is what makes the time constraint so difficult to handle. Every test taker is placed at the nexus of two competing elements: the need for speed (caused by the timed element) and the need for patience (caused by the detailed reading requirement). How well you manage these two elements strongly determines how well you perform. In the previous chapter we discussed how to practice using time elements, so make sure to use those ideas as you work through practice questions both in this book and in your other test materials.

Finally, analyze the structure of the stimulus: what pieces are present and how do those pieces relate to each other? In short, you are tasked with knowing as much as possible about the statements made by the author, and in order to do so, you must understand how the test makers create GMAT arguments. We will discuss argumentation in more detail in a moment.

GMAT argumentation is one of the main topics of this book, and will be discussed in every chapter.

Stimulus Topics

The spectrum of topics covered by Critical Reasoning stimuli is quite broad. Previous stimuli topics have ranged from art to business to medicine and science. According to the makers of the test, "Questions are based on materials from a variety of sources. No familiarity with the specific subject matter is needed."

Despite the previous statement, many GMAT students come from a humanities background and these test takers often worry about stimuli containing scientific or medical topics. Remember, the topic of a stimulus does not affect the underlying logical relationship of the argument parts. And, the GMAT will not assume that you know anything about advanced technical or scientific ideas. For example, while the GMAT may discuss mathematicians or the existence of a difficult problem in math, you will not be asked to make calculations nor will you be assumed to understand esoteric terminology. Any element beyond the domain of general public knowledge will be explained for you, as in the following example:

Some specific topics do recur, and we will note those in future chapters.

Scientist: Isaac Newton's *Principia*, the seventeenth-century work that served as the cornerstone of physics for over two centuries, could at first be understood by only a handful of people, but a basic understanding of Newton's ideas eventually spread throughout the world. This shows that the barriers to communication between scientists...

The stimulus above, although reproduced only in part, is a good example of how the test makers will supply information they feel is essential to understanding the question. In this case, the reader is not expected to understand either the content or historical importance of *Principia*, and so the test makers conveniently furnish that information. Thus, although on occasion you will see a stimulus that references an ominous looking word or idea (examples include *high-density lipoprotein* and *pironoma*, you will not need to know or be assumed to know anything more about those elements than what you are told by the test makers.

When you read a science-based stimulus, focus on understanding the relationship of the ideas and do not be intimidated by the terminology used by the author. As we will ultimately find, reading an GMAT stimulus is about seeing past the topic to analyze the structural relationships present in the stimulus. Once you are able to see these relationships, the topic will become less important.

Arguments versus Fact Sets

GMAT stimuli fall into two distinct categories: those containing an argument and those that are just a set of facts. Logically speaking, an argument can be defined as a set of statements wherein one statement is claimed to follow from or be derived from the others. Consider the following short example of an argument:

All professors are ethical. Mason is a professor. So Mason is ethical.

The first two statements in this argument give the reasons (or “premises”) for accepting the third statement, which is the conclusion of the argument.

Fact sets, on the other hand, are a collection of statements without a conclusion, as in the following example:

“The Jacksonville area has just over one million residents. The Cincinnati area has almost two million residents. The New York area has almost twenty million residents.”

The three sentences above do *not* constitute an argument because no conclusion is present and an argument, by definition, requires a conclusion. The three sentences merely make a series of assertions without making a judgment. Notice that reading these sentences does not cause much of a reaction in most readers. Really, who cares about the city sizes? This lack of a strong reaction is often an indication that you are not reading an argument and are instead reading just a set of facts.

When reading Critical Reasoning stimuli, you should seek to make several key determinations, which we call the Critical Reasoning Primary Objectives™. Your first task is to determine if you are reading an argument or a fact set.

Primary Objective #1: Determine whether the stimulus contains an argument or if it is only a set of factual statements.

To achieve this objective, you must recognize whether a conclusion is present. Let us talk about how to do this next.

There are many books on logic and argumentation. In this book we attempt to concisely spell out what you need to know to succeed on the GMAT. This is different from philosophical logic, and therefore this section will not teach you argumentation as it is taught in a university.

Fact sets rarely cause a strong reaction in the reader because no persuasion is being used. When an author attempts to persuade you to believe a certain conclusion, there tends to be a noticeable reaction.

Identifying Premises and Conclusions

For GMAT purposes, a premise can be defined as:

“A fact, proposition, or statement from which a conclusion is made.”

Premises support and explain the conclusion. Literally, the premises give the reasons why the conclusion should be accepted. To identify premises, ask yourself, “*What reasons has the author used to persuade me? Why should I believe this argument? What evidence exists?*”

A premise gives a reason why something should be believed.

A conclusion can be defined as:

“A statement or judgment that follows from one or more reasons.”

Conclusions, as summary statements, are supposed to be drawn from and rest on the premises. To identify conclusions, ask yourself, “*What is the author driving at? What does the author want me to believe? What point follows from the others?*”

A conclusion is the point the author tries to prove by using another statement.

Because language is the test maker’s weapon of choice, you must learn to recognize the words that indicate when a premise or conclusion is present. In expressing arguments, authors often use the following words or phrases to introduce premises and conclusions:

Premise Indicators

because
since
for
for example
for the reason that
in that
given that
as indicated by
due to
owing to
this can be seen from
we know this by

Conclusion Indicators

thus
therefore
hence
consequently
as a result
so
accordingly
clearly
must be that
shows that
conclude that
follows that
for this reason

Make sure to memorize these word lists. Recognizing argument elements is critical!

Because there are so many variations in the English language, these lists cannot be comprehensive, but they do capture many of the premise and conclusion indicators used by GMAT authors. As for frequency of appearance, the top two words in each list are used more than any of the other words in the list.

Arguments can contain more than one premise and more than one conclusion.

When you are reading, always be aware of the presence of the words listed

above. These words are like road signs; they tell you what is coming next. Consider the following example:

Humans cannot live on Venus because the surface temperature is too high.

As you read the first portion of the sentence, “Humans cannot live on Venus,” you cannot be sure if you are reading a premise or conclusion. But, as soon as you see the word “because”—a premise indicator—you know that a premise will follow, and at that point you know that the first portion of the sentence is a conclusion. In the argument above, the author wants you to believe that humans cannot live on Venus, and the reason is that the surface temperature is too high.

In our daily lives, we make and hear many arguments. However, unlike on the GMAT, the majority of these arguments occur in the form of conversations (and when we say “argument,” we do not mean a fight!). Any GMAT argument can be seen as an artificial conversation, even the basic example above:

Author: “Humans cannot live on Venus.”

Respondent: “Really? Why is that?”

Author: “The surface temperature of Venus is too high.”

If at first you struggle to identify the pieces of an argument, you can always resort to thinking about the argument as an artificial conversation and that may assist you in locating the conclusion.

Here are more examples of premise and conclusion indicators in use:

1. “The economy is in tatters. Therefore, we must end this war.”

“Therefore” introduces a conclusion; the first sentence is a premise.

2. “We must reduce our budget due to the significant cost overruns we experienced during production.”

“due to” introduces a premise; “We must reduce our budget” is the conclusion.

3. “Fraud has cost the insurance industry millions of dollars in lost revenue. Thus, congress will pass a stricter fraud control bill since the insurance industry has one of the most powerful lobbies.”

This argument contains two premises: the first premise is the first sentence and the second premise follows the word “since” in the second sentence; the conclusion is “congress will pass a stricter

About 75% of GMAT stimuli contain arguments. The remainder are fact sets.

Important note: premises and conclusions can be constructed without indicator words present.

fraud control bill.”

Notice that premises and conclusions can be presented in any order—the conclusion can be first or last, and the relationship between the premises and the conclusion remains the same regardless of the order of presentation. For example, if the order of the premise(s) and conclusion was switched in any of the examples above, the logical structure of the argument would not change.

Also notable is that the premises and the conclusion can appear in the same sentence, or be separated out into multiple sentences. Whether the ideas are together or separated has no effect on the logical structure of the argument.

If a conclusion is present, you *must* identify the conclusion prior to proceeding on to the question stem. Often, the reason students miss questions is because they have failed to fully and accurately identify the conclusion of the argument.

Primary Objective #2: If the stimulus contains an argument, identify the conclusion of the argument. If the stimulus contains a fact set, examine each fact.

One Confusing Form

Because the job of the test makers is to determine how well you can interpret information, they will sometimes arrange premise and conclusion indicators in a way that is designed to be confusing. One of their most confusing forms places a conclusion indicator and premise indicator back-to-back, separated by a comma, as in the following examples:

“Therefore, since...”

“Thus, because...”

“Hence, due to...”

A quick glance would seemingly indicate that what will follow is both a premise and a conclusion. In this instance, however, the presence of the comma creates a clause that, due to the premise indicator, contains a premise. The end of that premise clause will be closed with a second comma, and then what follows will be the conclusion, as in the following:

“Therefore, since higher debt has forced consumers to lower their savings, banks now have less money to loan.”

“Higher debt has forced consumers to lower their savings” is the premise; “banks now have less money to loan” is the conclusion. So, in this instance “therefore” still introduces a conclusion, but the appearance of the conclusion is interrupted by a clause that contains a premise.

Order of presentation has no effect on the logical structure of the argument. The conclusion can appear at the beginning, the middle, or the end of the argument.

Remember, a fact set does *not* contain a conclusion; an argument must contain a conclusion.

This form is called the “conclusion/premise indicator form.”

Premise and Conclusion Recognition Mini-Drill

Each of the following problems contains a short argument. For each argument, identify the conclusion and the premise(s). Answers on the next page.

1. "Given that the price of steel is rising, we will no longer be able to offer discounts on our car parts."
2. "The political situation in Somalia is unstable owing to the ability of individual warlords to maintain powerful armed forces."
3. "Since we need to have many different interests to sustain us, the scientists' belief must be incorrect."
4. "So, as indicated by the newly released data, we should push forward with our efforts to recolonize the forest with snowy tree crickets."
5. "Television has a harmful effect on society. This can be seen from the poor school performance of children who watch significant amounts of television and from the fact that children who watch more than six hours of television a day tend to read less than non-television watching children."
6. "The rapid diminishment of the ecosystem of the Amazon threatens the entire planet. Consequently, we must take immediate steps to convince the Brazilian government that planned development projects need to be curtailed for the simple reason that these development projects will greatly accelerate the loss of currently protected land."

Premise and Conclusion Recognition Mini-Drill Answer Key

1. Features the premise indicator "given that."

Premise: "Given that the price of steel is rising,"

Conclusion: "we will no longer be able to offer discounts on our car parts."

2. Features the premise indicator "owing to."

Premise: "owing to the ability of individual warlords to maintain powerful armed forces."

Conclusion: "The political situation in Somalia is unstable"

3. Features the premise indicator "since."

Premise: "Since we need to have many different interests to sustain us,"

Conclusion: "the scientists' belief must be incorrect."

4. Features the conclusion/premise form indicator "So, as indicated by."

Premise: "as indicated by the newly released data"

Conclusion: "we should push forward with our efforts to recolonize the forest with snowy tree crickets."

5. Features the premise indicator "this can be seen from." The second sentence contains two premises.

Premise 1: "This can be seen from the poor school performance of children who watch significant amounts of television"

Premise 2: "and from fact that children who watch more than six hours of television a day tend to read less than non-television watching children."

Conclusion: "Television has a harmful effect on society." Note how this sentence does not contain a conclusion indicator. Yet, we can determine that this is the conclusion because the other sentence contains two premises.

6. Features the conclusion indicator "consequently" and the premise indicator "for the simple reason that." There are also two premises present.

Premise 1: "The rapid diminishment of the ecosystem of the Amazon threatens the entire planet."

Premise 2: "for the simple reason that these development projects will greatly accelerate the loss of currently protected land."

Conclusion: "we must take immediate steps to convince the Brazilian government that planned development projects need to be curtailed"

Additional premises are still, of course, premises. They may be central to the argument or they may be secondary. To determine the importance of the premise, examine the remainder of the argument.

Additional Premise Indicators

Aside from previously listed premise and conclusions indicators, there are other argument indicator words you should learn to recognize. First, in argument forms, sometimes the author will make an argument and then for good measure add another premise that supports the conclusion but is sometimes non-essential to the conclusion. These are known as *additional premises*:

Additional Premise Indicators

Furthermore
Moreover
Besides
In addition
What's more

Following are two examples of additional premise indicators in use:

1. "Every professor at Fillmore University teaches exactly one class per semester. Fillmore's Professor Jackson, therefore, is teaching exactly one class this semester. Moreover, I heard Professor Jackson say she was teaching only a single class."

The first sentence is a premise. The second sentence contains the conclusion indicator "therefore" and is the conclusion of the argument. The first sentence is the main proof offered by the author for the conclusion. The third sentence begins with the additional premise indicator "moreover." The premise in this sentence is non-essential to the argument, but provides additional proof for the conclusion and could be, if needed, used to help prove the conclusion separately (this would occur if an objection was raised to the first premise).

2. "The city council ought to ease restrictions on outdoor advertising because the city's economy is currently in a slump. Furthermore, the city should not place restrictions on forms of speech such as advertising."

The first sentence contains both the conclusion of the argument and the main premise of the argument (introduced by the premise indicator "because"). The last sentence contains the additional premise indicator "furthermore." As with the previous example, the additional premise in this sentence is non-essential to the argument but provides additional proof for the conclusion.

Counter-Premise Indicators

When creating an argument, an author will sometimes bring up a counter-premise—a premise that actually contains an idea that is counter to the argument. At first glance, this might seem like an odd thing for an author to do. But by raising the counter-premise and then addressing the complaint in a direct fashion, the author can minimize the damage that would be done by the objection if it were raised elsewhere.

Counter-premises, also called adversatives, bring up points of opposition or comparison.

Counter-premises can also be ideas that compare and contrast with the argument, or work against a previously raised point. In this sense, the general counter-premise concept discusses an idea that is in some way different from another part of the argument.

Counter-premise Indicators

But
Yet
However
On the other hand
Admittedly
In contrast
Although
Even though
Still
Whereas
In spite of
Despite
After all

Following is an example of a counter-premise indicator in use:

1. "The United States prison population is the world's largest and consequently we must take steps to reduce crime in this country. Although other countries have higher rates of incarceration, their statistics have no bearing on the dilemma we currently face."

The first sentence contains a premise and the conclusion (which is introduced by the conclusion indicator "consequently"). The third sentence offers up a counter-premise as indicated by the word "although."

Additional Premise and Counter-Premise Recognition Mini-Drill

Each of the following problems contains a short argument. For each argument, identify the conclusion, the premise(s), and any additional premises or counter-premises. Answers on the next page.

1. Wine is made by crushing grapes and eventually separating the juice from the grape skins. However, the separated juice contains impurities and many wineries do not filter the juice. These wineries claim the unfiltered juice ultimately produces a more flavorful and intense wine. Since these wine makers are experts, we should trust their judgment and not shy away from unfiltered wine.
2. Phenylketonurics are people who cannot metabolize the amino acid phenylalanine. There are dangers associated with phenylketonuria, and products containing phenylalanine must carry a warning label that states, "Phenylketonurics: contains phenylalanine." In addition, all children in developed societies receive a phenylketonuria test at birth. Hence, at the moment, we are doing as much as possible to protect against this condition.
3. During last night's robbery, the thief was unable to open the safe. Thus, last night's robbery was unsuccessful despite the fact that the thief stole several documents. After all, nothing in those documents was as valuable as the money in the safe.

Additional Premise and Counter-Premise Recognition Mini-Drill Answer Key

1. Features the counter-premise indicator “however” and the premise indicator “since.”

Premise: “Wine is made by crushing grapes and eventually separating the juice from the grape skins.”

Counter-premise: “However, the separated juice contains impurities and many wineries do not filter the juice.”

Premise: “These wineries claim the unfiltered juice ultimately produces a more flavorful and intense wine.”

Premise: “Since these wine makers are experts,”

Conclusion: “we should trust their judgment and not shy away from unfiltered wine.”

2. Features the additional premise indicator “in addition” and the conclusion indicator “hence.” In this problem the additional premise is central to supporting the conclusion.

Premise: “Phenylketonurics are people who cannot metabolize the amino acid phenylalanine.”

Premise: “There are dangers associated with phenylketonuria, and products containing phenylalanine must carry a warning label that states, ‘Phenylketonurics: contains phenylalanine.’ ”

Additional Premise: “In addition, all children in developed societies received a phenylketonuria test at birth.”

Conclusion: “Hence, at the moment, we are doing as much as possible to protect against this condition.”

3. Features the counter-premise indicator “despite”; the additional premise indicator “after all”; and the conclusion indicator “thus.” The additional premise serves to downplay the counter-premise.

Premise: “During last night’s robbery, the thief was unable to open the safe.”

Counter-premise: “despite the fact that the thief stole several documents.”

Additional Premise: “After all, nothing in those documents was as valuable as the money in the safe.”

Conclusion: “Thus, last night’s robbery was unsuccessful ”

Recognizing Conclusions Without Indicators

Many of the arguments we have encountered up until this point have had conclusion indicators to help you recognize the conclusion. And, many of the arguments you will see on the GMAT will also have conclusion indicators. But you will encounter arguments that do not contain conclusion indicators. Following is an example:

The best way of eliminating traffic congestion will not be easily found. There are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag.

An argument such as the above can be difficult to analyze because no indicator words are present. How then, would you go about determining if a conclusion is present, and if so, how would you identify that conclusion? Fortunately, there is a fairly simple trick that can be used to handle this situation, and any situation where you are uncertain of the conclusion (even those with multiple conclusions, as will be discussed next).

Aside from the questions you can use to identify premises and conclusions (described earlier in this chapter), the easiest way to determine the conclusion in an argument is to use the Conclusion Identification Method™:

Take the statements under consideration for the conclusion and place them in an arrangement that forces one to be the conclusion and the other(s) to be the premise(s). Use premise and conclusion indicators to achieve this end. Once the pieces are arranged, determine if the arrangement makes logical sense. If so, you have made the correct identification. If not, reverse the arrangement and examine the relationship again. Continue until you find an arrangement that is logical.

Let us apply this method to the argument at the top of this page. For our first arrangement we will make the first sentence the premise and the second sentence the conclusion, and supply indicators (in italics):

Because the best way of eliminating traffic congestion will not be easily found, *we can conclude that* there are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag.

Does that sound right? No. Let us try again, this time making the first sentence the conclusion and the second sentence the premise:

Because there are so many competing possibilities that it will take millions of dollars to study every option, and implementation of most options carries an exorbitant price tag, *we can conclude that* the best

GMAC says you are expected to possess, in their words, "a college-level understanding of widely used concepts such as argument, premise, assumption, and conclusion."

way of eliminating traffic congestion will not be easily found.

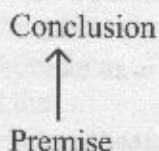
Clearly, the second arrangement is far superior because it makes sense. In most cases when you have the conclusion and premise backward, the arrangement will be confusing. The correct arrangement always sounds more logical.

Complex Arguments

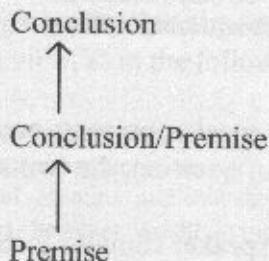
Up until this point, we have only discussed simple arguments. Simple arguments contain a single conclusion. While many of the arguments that appear on the GMAT are simple arguments, there are also a fair number of complex arguments. Complex arguments contain more than one conclusion. In these instances, one of the conclusions is the main conclusion, and the other conclusions are subsidiary conclusions (also known as sub-conclusions).

While complex argumentation may sound daunting at first, you make and encounter complex argumentation every day in your life. In basic terms, a complex argument makes an initial conclusion based on a premise. The author then uses that conclusion as the foundation (or premise) for another conclusion, thus building a chain with several levels. Let us take a look at the two types of arguments in diagram form:

In abstract terms, a simple argument appears as follows:



As discussed previously, the premise supports the conclusion, hence the arrow from the premise to the conclusion. By comparison, a complex argument takes an initial conclusion and then uses it as a premise for another conclusion:



Thus, a statement can be both a conclusion for one argument and a premise for another. In this sense, a complex argument can appear somewhat like a ladder, where each level or "rung" is used to build the next level. Given enough time you could build an argument with hundreds of levels. On the GMAT, however,

A simple argument does not mean that the argument is easy to understand. Simple in this context means that the argument contains only a single conclusion.

there are typically three or four levels at most. Let us look at an example of a complex argument:

Because the Vikings have the best quarterback in football, they therefore have the best offense in football. Because they have the best offense in football, they will win the Super Bowl next year.

In this argument, the first sentence contains a premise followed by a conclusion. This initial conclusion is then used in the second sentence as a premise to make a larger conclusion:

Premise: "Because the Vikings have the best quarterback in football,"
Sub-Conclusion (conclusion of the previous premise/Premise for the following conclusion): "they therefore have the best offense in football."

Main Conclusion: "they will win the Super Bowl next year."

As we will see in Chapter Ten while discussing Method of Reasoning questions, one of the most commonly used complex argument forms is to place the main conclusion in the first sentence of the argument, and then to place the sub-conclusion in the last sentence of the argument, preceded by a conclusion indicator. This form is quite useful since it tends to trick students into thinking the last sentence is the main conclusion.

Another form of complex argumentation occurs with two-speaker stimuli. In these questions, two separate speakers are identified, and each presents his or her own argument or comment. Here is an example:

Anne: Halley's Comet, now in a part of its orbit relatively far from the Sun, recently flared brightly enough to be seen by telescope. No comet has ever been observed to flare so far from the Sun before, so such a flare must be highly unusual.

Sue: Nonsense. Usually no one bothers to try to observe comets when they are so far from the Sun. This flare was observed only because an observatory was tracking Halley's Comet very carefully.

In the argument above, each speaker presents premises and a conclusion. As often occurs with this form of question, the two speakers disagree.

One of the benefits of a two-speaker stimulus is that the test makers can introduce multiple viewpoints on the same subject. As you might imagine, the presence of multiple viewpoints tends to be confusing, and the extra viewpoints offer the test makers the opportunity to ask a wider variety of questions.

The makers of the GMAT love to use complex argumentation because the presence of multiple conclusions tends to confuse students, making attractive wrong answer choices easier to create.

A Commonly Used Construction

Even within a single-speaker stimulus the test makers can raise alternate viewpoints. One of the most frequently used constructions is to raise a viewpoint at the beginning of the stimulus and then disagree with it immediately thereafter. This efficiently raises two opposing views in a very short paragraph. These stimuli are recognizable because they often begin with the phrase, "Some people claim..." or one of the many variations on this theme, including but not limited to the following:

"Some people propose..."

"Many people believe..."

"Some argue that..." or "Some people argue that..."

"Some critics claim..."

"Some critics maintain..."

"Some scientists believe..."

The structure of this opening sentence is remarkably consistent in form, and adheres to the following formula:

A *number* (some, many, etc.) of *people* (critics, students, teachers, legislators, vegetarians, psychologists etc.) *believe* (claim, propose, argue, etc.) that...

Of course, there are exceptions, as with these opening sentences:

"Although some people claim..." (starts with "although")

"It has been claimed that..." (drops the *number* and *people*)

"Cigarette companies claim that..." (drops the *number*)

The author can also break up the idea, by inserting contextual information, as in the following example:

"Some critics of space exploration programs *claim* that..."

The use of this device to begin a stimulus almost always leads to the introduction of the opposing view, as in the following partial stimulus:

Editorialist: Some people propose that, to raise revenues and encourage conservation, our country's taxes on oil, gasoline, and coal should be increased. Such a tax, however, would do more harm than good.

The editorialist uses the “Some people propose” device to introduce one opinion of taxes and then in the following sentence counters the idea with the view that turns out to be the editorialist’s main point (“Such a tax, however...”). The remainder of the problem went on to explain the reasoning behind the editorialist’s view.

Given the frequency with which this construction appears at the beginning of stimuli, you should learn to begin recognizing it now. We will again discuss this device in the Main Point section.

Truth versus Validity

Logicians spend a great deal of time discussing validity and truth, even going so far as to create complex truth tables that analyze the validity of arguments. We are not concerned with such methods because they do not apply to the GMAT.

So far, we have only identified the parts that are used to construct arguments. We have not made an analysis of the reasonableness or soundness of an argument. But, before moving on to argument analysis, you must be able to distinguish between two commonly confused concepts: validity and truth.

When we evaluate GMAT arguments, we are primarily concerned with validity. That is, what is the logical relationship of the pieces of the argument and how well do the premises, if accepted, prove the conclusion? We are less concerned with the absolute, real world truthfulness of either the premises or the conclusion. Some students will at first try to analyze every single GMAT statement on the basis of whether it is an absolutely true statement (does it happen as stated in the real world). For the most part, that is wasted effort. GMAT Critical Reasoning is primarily focused on whether the conclusion follows logically from a set of given premises. In many cases, the GMAT makers will let you work under a framework where the premises are simply accepted as factually accurate, and then you must focus solely on the method used to reach the conclusion. In a sense this could be called relative truthfulness—you are only concerned about whether the conclusion is true relative to the premises, not whether the conclusion is true in an absolute, real world sense. This is obviously a critical point, and one we will analyze later as we discuss different question types.

Argument Analysis

Once you have determined that an argument is present and you have identified the conclusion, you must determine if the argument is a good one or a bad one. This leads to the third Primary Objective:

Primary Objective #3: If the stimulus contains an argument, determine whether the argument is strong or weak.

To determine the strength of the argument, consider the relationship between the premises and the conclusion—do the premises strongly suggest that the conclusion would be true? Does the conclusion feel like an inevitable result of

In logic, the terms “strong/weak,” “good/bad,” “valid/invalid,” and “sound/unsound” are used to evaluate arguments. For our purposes, “strong,” “good,” “valid,” and “sound” will be interchangeable and all terms refer to the logical structure of the argument. The same holds true for “weak,” “bad,” “invalid,” and “unsound.”

the premises? Or does the conclusion seem to go beyond the scope of the information in the premises? How persuasive does the argument seem to you? When evaluating argument validity, the question you must always ask yourself is: Do the given facts support the conclusion?

To better understand this concept we will examine two sample arguments. The following argument uses the fact set we used before, with the addition of a conclusion:

"The Jacksonville area has just over one million residents. Cincinnati has almost two million residents. The New York area has almost twenty million residents. Therefore, we should move to Jacksonville."

The last sentence contains the conclusion, and makes this an argument. Notice how the presence of the conclusion causes you to react more strongly to the stimulus. Now, instead of just reading a set of cold facts, you are forced to consider whether the premises have proven the given conclusion. In this case the author asks you to accept that a move to Jacksonville is in order based on the population of the city. Do you think the author has proven this point?

When considering the above argument, most people simply accept the premises as factually accurate. There is nothing wrong with this (and indeed in the real world they are true). As mentioned moments ago, in GMAT argumentation the makers of the test largely allow authors to put forth their premises unchallenged. The test makers are far more concerned about whether those premises lead to the conclusion presented. In the argument above, there is no reason to doubt the accuracy of the premises, but even if we accept the premises as accurate, we still do not have to accept the conclusion.

Most people reading the argument above would agree that the reasoning is weak. Even though the premises are perfectly acceptable, by themselves they do not prove that "we should move to Jacksonville." The typical reader will experience a host of reactions to the conclusion: Why Jacksonville—why not a city that is even smaller? What about a larger city? What is so important about population? What about considerations other than population size? Because questions of this nature point to flaws in the argument, we would classify the argument as a poor one. That is, the premises do not prove the conclusion. As shown by this example, the acceptability of the premises does not automatically make the conclusion acceptable. The reverse is also true—the acceptability of the conclusion does not automatically make the premises acceptable.

The following is an example of a strong argument:

"Trees that shed their foliage annually are deciduous trees. Black Oak trees shed their leaves every year. Therefore, Black Oak trees are deciduous."

An argument can be valid without being true. For example, the following has a valid argument structure but is not "true" in a real world sense:

"All birds can fly. An ostrich is a bird. Therefore, an ostrich can fly."

Questions such as the ones posed in this paragraph suggest that the author has made unwarranted assumptions while constructing the argument. We will discuss assumptions in more detail later.

In this argument, the two premises lead directly to the conclusion. Unlike the previous argument, the author's conclusion seems reasonable and inevitable based on the two premises. Note that the strength of this argument is based solely on the degree to which the premises prove the conclusion. The truth of the premises themselves is not an issue in determining whether the argument is valid or invalid.

Inferences and Assumptions

When glancing through GMAT questions, you will frequently see the words *inference* and *assumption*. Let us take a moment to define the meaning of each term in the context of GMAT argumentation.

Most people have come to believe that the word *inference* means probably true or likely to be true. Indeed, in common usage *infer* is often used in the same manner as *imply*. On the GMAT these uses are incorrect. In logic, an inference can be defined as something that *must be true*. Thus, if you are asked to identify an inference of the argument, you must find an item that must be true based on the information presented in the argument.

Earlier we discussed assumptions in the context of commonsense assumptions that you can bring into each problem. In argumentation, an assumption is simply the same as an *unstated* premise—what must be true in order for the argument to be true. Assumptions can often have a great effect on the validity of the argument.

Separating an inference from an assumption can be difficult because the definition of each refers to what “must be true.” The difference is simple: an inference is what follows from an argument (in other words, a conclusion) whereas an assumption is what is taken for granted while making an argument. In one sense, an assumption occurs “before” the argument, that is, while the argument is being made. An inference is made “after” the argument is complete, and follows from the argument. Both concepts will be discussed in more detail in later chapters, but for the time being you should note that all authors make assumptions when creating their arguments, and all arguments have inferences that can be derived from the argument.

The Mind of an GMAT Author

Let us take a moment to differentiate the makers of the test from the author of each stimulus. The maker of the test is the GMAC, the organization that oversees the protocols under which the GMAT is constructed, administers the test, and processes and distributes the results. The stated purpose of the test makers is to examine your ability to analyze arguments, in an attempt to assess your suitability for business school. The author of the stimulus is the person from whose point of view each piece is written or the source from which the piece is drawn. Sometimes the persona of the author is made abundantly clear to

Assumptions are a part of every argument, and we will discuss them in detail in Chapter Nine.

Actually, the GMAC is just the “producer” of the GMAT. The actual question construction is done by outside companies such as Pearson VUE and ACT, Inc.

you because the stimulus is prefaced by a short identifier, such as *Division Manager* or *Reviewer*, or even a proper name such as *Roland* or *Sharon*. The source of a stimulus can also be made clear by similar identifiers, such as *Advertisement* or *Editorial*.

GMAT students sometimes confuse the aim of the test makers with the way those aims are executed. We know that the GMAC has an active interest in testing your ability to discern both good and bad reasoning. The makers of the exam intentionally present flawed arguments because they want to test whether you are easily confused or prone to be swayed by illogical arguments. This often raises situations where you are presented with arguments that are false or seemingly deceptive in nature. This does not mean that the *author* of the piece is part of the deception. The role of a GMAT author is simply to present an argument or fact set. GMAT authors (as separated from the test makers) do *not* try to deceive you with lies. Although GMAT authors may end up making claims that are incorrect, this is not done out of a willful intention to deceive. Deception on the *author's* part is too sophisticated for the GMAT—it is beyond the scope of GMAT stimuli, which are too short to have the level of complexity necessary for you to detect deception if it was intended. So, you need not feel as if the author is attempting to trick you in the making of the argument. This is especially true when premises are created. For example, when an GMAT author makes a premise statement such as, “19 percent of all research projects are privately funded,” this statement is likely to be accurate. A GMAT author would *not knowingly* create a false premise, and so, when examining arguments the likelihood is that the premises are not going to be in error and you should not look at them as a likely source of weakness in the argument. This does not mean that authors are infallible. GMAT authors make plenty of errors, but most of those mistakes are errors of reasoning that occur in the process of making the conclusion.

Not only do GMAT authors not attempt to deceive you, they believe (in their GMAT-world way) that the arguments they make are reasonable and solid. *When you read an GMAT argument from the perspective of the author, he or she believes that their argument is sound.* In other words, they do not knowingly make errors of reasoning. This is a fascinating point because it means that GMAT authors, as part of the GMAT world, function as if the points they raise and the conclusions they make have been well-considered and are airtight. This point will be immensely useful when we begin to look at certain forms of reasoning.

Consider the following argument: “My mail was delivered yesterday, so it will also be delivered today.”

Although this argument is flawed (it could be Sunday and the mail will not be delivered), the author has not intentionally made this error. Rather, the author has made the conclusion without realizing that he has committed an error.

Read the Fine Print

One of the aims of the GMAT is to test how closely you read. This is obviously an important skill for anyone in business (who wants an employee who makes a critical mistake in a big negotiation?). One of the ways the GMAT tests whether you have this skill is to probe your knowledge of exactly what the author said. Because of this, you must read all parts of a problem incredibly closely, and you must pay special attention to words that describe the relationships under discussion. For example, if an author concludes, "Therefore, the refinery can achieve a greater operating efficiency," do not make the mistake of thinking the author implied that greater operating efficiency *will* or *must* be achieved. The GMAT makers love to examine your comprehension of the exact words used by the author, and that leads to the fourth Primary Objective:

Primary Objective #4: Read closely and know precisely what the author said. Do not generalize!

When it comes to relationships, the makers of the GMAT have a wide variety of modifiers in their arsenal. The following are two lists of words that should be noted when they appear, regardless of whether they appear in the premises or conclusion.

Quantity Indicators

all
every
most
many
some
several
few
sole
only
not all
none

Probability Indicators

must
will
always
not always
probably
likely
would
not necessarily
could
rarely
never

These word lists do not require memorization. They are presented to give you a broad idea of the type of words that can take on an added importance in GMAT questions.

Quantity indicators refer to the amount or quantity in the relationship, such as "some people" or "many of the laws." Probability indicators refer to the likelihood of occurrence, or the obligation present, as in "The Mayor should resign" or "The law will never pass." Many of the terms fit with negatives to form an opposing idea, for example, "some are not" or "would not."

Words such as the Quantity and Probability Indicators are critical because they are a ripe area for the GMAT makers to exploit. There are numerous examples of incorrect answer choices that attempted to capitalize on the meaning of a single word in the stimulus and thus you must commit yourself to carefully examining every word on the test.

Scope

One topic you often hear mentioned in relation to argumentation is scope. The scope of an argument is the range to which the premises and conclusion encompass certain ideas. For example, consider an argument discussing a new surgical technique. The ideas of surgery and medicine are within the scope of the argument. The idea of federal monetary policy, on the other hand, would not be within the scope of the argument.

Arguments are sometimes described as having a narrow (or limited) scope or a wide (or broad) scope. An argument with a narrow scope is definite in its statements, whereas a wide scope argument is less definite and allows for a greater range of possibility. When we begin to examine individual questions, we will return to this idea and show how it can be used to help consider answer choices in certain situations.

Scope can be a useful idea to consider when examining answer choices, because some answer choices go beyond the bounds of what the author has established in the argument. However, scope is also a concept that is overused in modern test preparation. One test preparation company used to tell instructors that if they could not answer a student's question, they should just say that the answer was out of the scope of the argument! As we will see, there are always definite, identifiable reasons that can be used to eliminate incorrect answer choices.

Final Chapter Note

The discussion of argumentation in this chapter is, by design, not comprehensive. The purpose of this chapter is to give you a broad overview of the theory underlying GMAT arguments. In future chapters we will apply those theories to specific questions and continue to expand upon the discussion in this chapter. The vast majority of students learn best by examining the application of ideas, and we believe the great bulk of your learning will come by seeing these ideas in action.

Premise and Conclusion Analysis Drill

For each stimulus, identify the conclusion(s) and supporting premise(s), if any. The answer key will identify the conclusion and premises of each argument, the logical validity of each argument, and also comment on how to identify argument structure. *Answers on Page 43*

1. Every year, new reports appear concerning the health risks posed by certain substances, such as coffee and sugar. One year an article claimed that coffee is dangerous to one's health. The next year, another article argued that coffee has some benefits for one's health. From these contradictory opinions, we see that experts are useless for guiding one's decisions about one's health.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

Premise and Conclusion Analysis Drill

2. Some teachers claim that students would not learn curricular content without the incentive of grades. But students with intense interest in the material would learn it without this incentive, while the behavior of students lacking all interest in the material is unaffected by such an incentive. The incentive of grades, therefore, serves no essential academic purpose.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

3. Damming the Merv River would provide irrigation for the dry land in its upstream areas; unfortunately, a dam would reduce agricultural productivity in the fertile land downstream by reducing the availability and quality of water there. The productivity loss in the downstream area would be greater than the productivity gain upstream, so building a dam would yield no overall gain in agricultural productivity in the region as a whole.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

Premise and Conclusion Analysis Drill

4. In a study, infant monkeys given a choice between two surrogate mothers—a bare wire structure equipped with a milk bottle, or a soft, suede-covered wire structure equipped with a milk bottle—unhesitatingly chose the latter. When given a choice between a bare wire structure equipped with a milk bottle and a soft, suede-covered wire structure lacking a milk bottle, they unhesitatingly chose the former.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

5. While it was once believed that the sort of psychotherapy appropriate for the treatment of neuroses caused by environmental factors is also appropriate for schizophrenia and other psychoses, it is now known that these latter, more serious forms of mental disturbance are best treated by biochemical—that is, medicinal—means. This is conclusive evidence that psychoses, unlike neuroses, have nothing to do with environmental factors but rather are caused by some sort of purely organic condition, such as abnormal brain chemistry or brain malformations.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

Premise and Conclusion Analysis Drill

6. If relativity theory is correct, no object can travel forward in time at a speed greater than the speed of light. Yet quantum mechanics predicts that the tachyon, a hypothetical subatomic particle, travels faster than light. Thus, if relativity theory is correct, either quantum mechanics' prediction about tachyons is erroneous or tachyons travel backwards in time.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

7. Any course that teaches students how to write is one that will serve them well later in life. Therefore, since some philosophy courses teach students how to write, any student, whatever his or her major, will be served well in later life by taking any philosophy course.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

Premise and Conclusion Analysis Drill

8. It is well known that many species adapt to their environment, but it is usually assumed that only the most highly evolved species alter their environment in ways that aid their own survival. However, this characteristic is actually quite common. Certain species of plankton, for example, generate a gas that is converted in the atmosphere into particles of sulfate. These particles cause water vapor to condense, thus forming clouds. Indeed, the formation of clouds over the ocean largely depends on the presence of these particles. More cloud cover means more sunlight is reflected, and so the Earth absorbs less heat. Thus plankton cause the surface of the Earth to be cooler and this benefits the plankton.

A. What is the conclusion of the argument, if any?

B. What premises are given in support of this conclusion?

C. Is the argument strong or weak? If you think that the argument is weak, please explain why.

Premise and Conclusion Analysis Drill Answer Key

Question #1.

Conclusion: From these contradictory opinions, we see that experts are useless for guiding one's decisions about one's health.

Premise: Every year, new reports appear concerning the health risks posed by certain substances, such as coffee and sugar.

Premise: One year an article claimed that coffee is dangerous to one's health.

Premise: The next year, another article argued that coffee has some benefits for one's health.

The conclusion is introduced by the phrase "we see that."

The argument is weak. The conclusion is far too strong in saying that "experts are useless." Just because the different articles about substances disagree does not prove that experts cannot help you with your health (a much broader field than the substances cover). In addition, the articles about coffee could have covered differing aspects of coffee, some of which are beneficial and some of which are detrimental.

Question #2.

Conclusion: The incentive of grades, therefore, serves no essential academic purpose.

Premise: Some teachers claim that students would not learn curricular content without the incentive of grades.

Premise: But students with intense interest in the material would learn it without this incentive, while the behavior of students lacking all interest in the material is unaffected by such an incentive.

The conclusion contains the conclusion indicator, "therefore." Note also the use of the "Some teachers claim..." device discussed earlier in the chapter. This construction raises a viewpoint that the author eventually argues against.

The argument is weak. When discussing the students, the author makes the mistake of discussing only the extremes—those with intense interest and those lacking all interest. No effort is made to address the students who fall between these extremes.

Premise and Conclusion Analysis Drill Answer Key

Question #3.

Conclusion: Building a dam would yield no overall gain in agricultural productivity in the region as a whole.

Premise: Damming the Merv River would provide irrigation for the dry land in its upstream areas.

Premise: Unfortunately, a dam would reduce agricultural productivity in the fertile land downstream by reducing the availability and quality of water there.

Premise: The productivity loss in the downstream area would be greater than the productivity gain upstream.

The conclusion is introduced in the last sentence by the indicator “so.”

The argument is strong. The author discusses both the upstream and downstream areas, showing that the gain from the dam in the upstream area would not offset the loss of productivity in the downstream area. In fact, it appears an even stronger conclusion would be warranted, such as “building a dam would yield an overall loss of productivity. Since the author directly addresses overall productivity, possible objections about acreage and volume produced are rendered moot. The author even goes so far as to indicate that the downstream land is fertile, deflecting another possible objection about the work involved in making the land productive.

Note that this is a good example of a fantasy stimulus, one that is based on a scenario that does not exist in the real world. There is no “Merv River” anywhere in the world (although there was an ancient city of Merv in Turkmenistan). Stimuli like this one are often created to portray a certain reasoning form or situation. While fantasy stimuli are often obvious (containing fake countries, etc.), you should not approach them any differently than real-world, fact-based stimuli because Critical Reasoning is about argumentation, and argumentation can be portrayed equally well in real world or fantasy stimuli.

Question #4.

Premise: In a study, infant monkeys given a choice between two surrogate mothers—a bare wire structure equipped with a milk bottle, or a soft, suede-covered wire structure equipped with a milk bottle—unhesitatingly chose the latter.

Premise: When given a choice between a bare wire structure equipped with a milk bottle and a soft, suede-covered wire structure lacking a milk bottle, they unhesitatingly chose the former.

Careful! The stimulus is only a fact set and does not contain a conclusion. Therefore, there is no argument present and no evaluation of argument validity can be made.

Premise and Conclusion Analysis Drill Answer Key

Question #5.

Conclusion: This is conclusive evidence that psychoses, unlike neuroses, have nothing to do with environmental factors but rather are caused by some sort of purely organic condition, such as abnormal brain chemistry or brain malformations.

Premise: While it was once believed that the sort of psychotherapy appropriate for the treatment of neuroses caused by environmental factors is also appropriate for schizophrenia and other psychoses, it is now known that these latter, more serious forms of mental disturbance are best treated by biochemical—that is, medicinal—means.

The conclusion is introduced by the phrase “this is conclusive evidence that.”

The argument is weak. Again, the language used by the author is too strong—“nothing to do with environmental factors”—for the evidence provided by the premises. Nowhere in the argument has the author proven beyond a shadow of doubt that environmental factors do not play a role in neuroses.

Question #6.

Conclusion: Thus, if relativity theory is correct, either quantum mechanics’ prediction about tachyons is erroneous or tachyons travel backwards in time.

Premise: If relativity theory is correct, no object can travel forward in time at a speed greater than the speed of light.

Premise: Yet quantum mechanics predicts that the tachyon, a hypothetical subatomic particle, travels faster than light.

The conclusion is introduced by the indicator “thus.” The second premise is actually a counter-premise introduced by the indicator “yet.”

The argument is strong. Note how the author qualifies the conclusion, using the phrase “if relativity theory is correct.” This qualifying phrase makes the argument easier to defend because it protects against the possibility that relativity theory is wrong (if relativity theory is wrong, the author’s conclusion does not apply). Note the conclusion concerning travelling backwards in time as the other possibility is set up by the fact that quantum theory predicts that no object can travel forward in time at a speed greater than the speed of light. If an object cannot travel forward in time, then it must travel backwards (time does not stop, of course, so those are the only two options).

Premise and Conclusion Analysis Drill Answer Key

Question #7.

Conclusion: Any student, whatever his or her major, will be served well in later life by taking any philosophy course.

Premise: Any course that teaches students how to write is one that will serve them well later in life.

Premise: Some philosophy courses teach students how to write.

The conclusion is introduced by the device "therefore, since" and in this case the inserted premise is quite lengthy.

The argument is weak. Although the premise indicates that *some* philosophy courses teach students how to write, the conclusion goes too far in saying students will be served well in later life by taking *any* philosophy course.

Question #8.

Conclusion: This characteristic [altering the environment] is actually quite common

Premise: It is well known that many species adapt to their environment, but it is usually assumed that only the most highly evolved species alter their environment in ways that aid their own survival.

Premise: Certain species of plankton, for example, generate a gas that is converted in the atmosphere into particles of sulfate.

Premise: These particles cause water vapor to condense, thus forming clouds.

Premise: Indeed, the formation of clouds over the ocean largely depends on the presence of these particles.

Premise: More cloud cover means more sunlight is reflected, and so the Earth absorbs less heat.

Premise: Thus plankton cause the surface of the Earth to be cooler and this benefits the plankton.

This argument is hard to absorb because the subject matter is challenging and the structure is complex. The main conclusion is actually the second sentence. There is another conclusion in the argument, in the last sentence, but this is a sub-conclusion. This sub-conclusion appears in the plankton example, and like all examples, it is used to illustrate the main conclusion.

The argument is strong. A viewpoint is presented (that it is thought that only highly evolved species alter their environment) and then this viewpoint is disputed with the example of a simple organism that changes its environment. Although the author has not proven undeniably that the characteristic is "quite common" (this would require more examples), the author has successfully shown that non-highly evolved species exhibit that characteristic, making it likely that the characteristic appears in other species.

C

CHAPTER THREE: THE QUESTION STEM AND ANSWER CHOICES

The Question Stem

The question stem follows the stimulus and poses a question directed at the stimulus. In some ways the question stem is the most important part of each problem because it specifies the task you must perform in order to get credit for the problem.

GMAT question stems cover a wide range of tasks, and will variously ask you to:

- identify details of the stimulus
- describe the structure of the argument
- strengthen or weaken the argument
- identify inferences, main points, and assumptions
- recognize errors of reasoning
- reconcile conflicts
- find arguments that are identical in structure

Analyzing the Question Stem

When examining a typical Critical Reasoning section, you may come to the conclusion that there are dozens of different types of question stems. The test makers create this impression by varying the words used in each question stem. As we will see shortly, even though they use different words, many of these question stems are identical in terms what they ask you to do.

In order to easily handle the different questions, we categorize the question stems that appear on the GMAT. Fortunately, every question stem can be defined as a certain type, and the more familiar you are with the question types, the faster you can respond when faced with individual questions. Thus, one of your tasks is to learn each question type and become familiar with the characteristics that define each type. We will help you accomplish this goal by including a variety of question type identification drills, and by examining each type of question in detail. This leads to the fifth Primary Objective:

Primary Objective #5: Carefully read and identify the question stem. Do not assume that certain words are automatically associated with certain question types.

Make sure to read the question stem very carefully. Some stems direct you to focus on certain aspects of the stimulus and if you miss these clues you make the problem much more difficult.

You must correctly analyze and classify every question stem because the question stem ultimately determines the nature of the correct answer choice. A mistake in analyzing the question stem almost invariably leads to a missed question. As we will see, the test makers love to use certain words—such as “support”—in different ways because they know some test takers will automatically assume these words imply a certain type of question. Properly identifying the question stem type will allow you to proceed quickly and with confidence, and in some cases it will help you determine the correct answer before you read any of the five answer choices.

The Ten Critical Reasoning Question Types

Each question stem that appears in the Critical Reasoning section of the GMAT can be classified into one of ten different types:

1. Must Be True/Most Supported
2. Main Point
3. Assumption
4. Strengthen/Support
5. Resolve the Paradox
6. Weaken
7. Method of Reasoning
8. Flaw in the Reasoning
9. Parallel Reasoning
10. Evaluate the Argument

Question stems contain criteria that must be met. This criteria could be to weaken the argument, find the method of reasoning, etc.

Occasionally, students ask if we refer to the question types by number or by name. We always refer to the questions by name as that is an easier and more efficient approach. Numerical question type classification systems force you to add two unnecessary levels of abstraction to your thinking process. For example, consider a question that asks you to “weaken” the argument. In a numerical question classification system, you must first recognize that the question asks you to weaken the argument, then you must classify that question into a numerical category (say, Type 6), and then you must translate Type 6 to mean “Weaken.” Literally, numerical classification systems force you to perform an abstract, circular translation of the meaning of the question, and the translation process is both time-consuming and valueless.

In the following pages we will discuss each question type in brief. Later we will examine each question type in its own chapter.

1. Must Be True/Most Supported

This category is simply known as “Must Be True.” Must Be True questions ask you to identify the answer choice that is best proven by the information in the stimulus. Question stem examples:

“If the statements above are true, which one of the following must also be true?”

“Which one of the following can be properly inferred from the passage?”

2. Main Point

Main Point questions are a variant of Must Be True questions. As you might expect, a Main Point question asks you to find the primary conclusion made by the author. Question stem example:

“The main point of the argument is that”

3. Assumption

These questions ask you to identify an assumption of the author’s argument. Question stem example:

“Which one of the following is an assumption required by the argument above?”

4. Strengthen/Support

These questions ask you to select the answer choice that provides support for the author’s argument or strengthens it in some way. Question stem examples:

“Which one of the following, if true, most strengthens the argument?”

“Which one of the following, if true, most strongly supports the statement above?”

In the answer key to this book, all questions are classified as one of these ten types. There are also additional indicators designating reasoning type, etc.

5. Resolve the Paradox

Every Resolve the Paradox stimulus contains a discrepancy or seeming contradiction. You must find the answer choice that best resolves the situation. Question stem example:

“Which one of the following, if true, would most effectively resolve the apparent paradox above?”

6. Weaken

Weaken questions ask you to attack or undermine the author’s argument. Question stem example:

“Which one of the following, if true, most seriously weakens the argument?”

7. Method of Reasoning

Method of Reasoning questions ask you to describe, in abstract terms, the way in which the author made his or her argument. Question stem example:

“Which one of the following describes the technique of reasoning used above?”

8. Flaw in the Reasoning

Flaw in the Reasoning questions ask you to describe, in abstract terms, the error of reasoning committed by the author. Question stem example:

“The reasoning in the astronomer’s argument is flawed because this argument”

9. Parallel Reasoning

Parallel Reasoning questions ask you to identify the answer choice that contains reasoning most similar in structure to the reasoning presented in the stimulus. Question stem example:

“Which one of the following arguments is most similar in its pattern of reasoning to the argument above?”

10. Evaluate the Argument

With Evaluate the Argument questions you must decide which answer choice will allow you to determine the logical validity of the argument. Question stem example:

“The answer to which one of the following questions would contribute most to an evaluation of the argument?”

Other question type elements will be discussed, most notably question variants (such as Argument Part questions). Those will be discussed in later chapters.

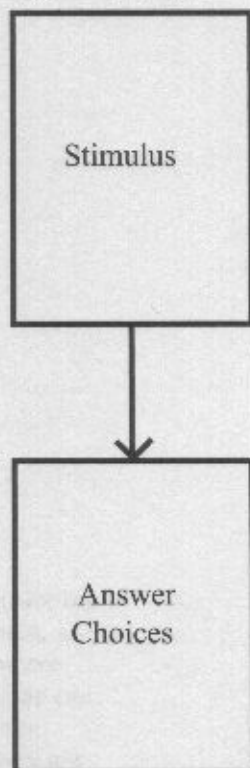
Important Note: Although there are ten separate question types on the GMAT, each question type does *not* appear with the same frequency. The most popular question types are Weaken, Must Be True, Assumption, Strengthen, and Resolve. If your GMAT test date is approaching quickly and you have little time to study, go directly to those chapters and study those question types first.

Although each of these question types is distinct, they are related in terms of the root function you are asked to perform. Questions that appear dissimilar, such as Must Be True and Method of Reasoning, are actually quite similar when considered in terms of how you work with the question. All question types are variations of three main question “families,” and each family is comprised of question types that are similar to each other.

On the next page, we delineate the three families using box-and-arrow diagrams that reflect the flow of information between the stimulus and the answer choices.

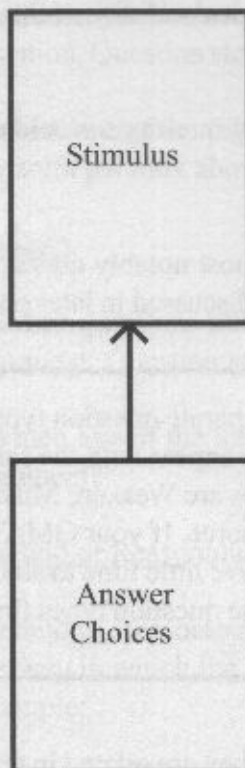
Family #1: Prove

Types 1, 2, 7, 8, 9:



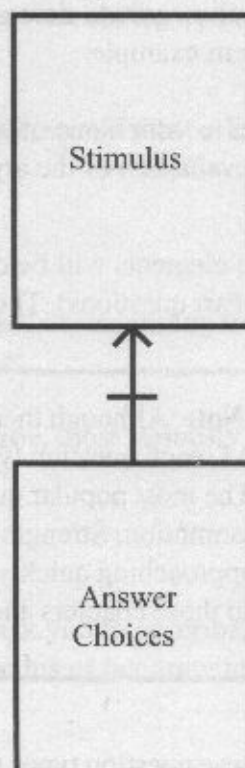
Family #2: Help

Types 3, 4, 5:



Family #3: Hurt

Type 6:



Family #1, also known as the Must Be or Prove Family, consists of the following question types:

- (1) Must Be True
- (2) Main Point
- (7) Method of Reasoning
- (8) Flaw in the Reasoning
- (9) Parallel Reasoning

Family #2, also known as the Help Family, consists of the following question types:

- (3) Assumption
- (4) Strengthen/Support
- (5) Resolve the Paradox

Family #3, also known as the Hurt Family, consists of the following question type:

- (6) Weaken

The boxes on the preceding page represent the stimulus and answer choices for any given Critical Reasoning question. The arrows represent the flow of information; one part of the problem is simply accepted and the other part is affected. There are two basic rules to follow when analyzing the diagrams:

1. The part (stimulus or answer choices) at the start of the arrow is accepted as is, and no additional information (aside from general domain assumptions) can be brought in.
2. The part (stimulus or answer choices) at the end of the arrow is what is affected or determined (for example, are you asked to Weaken the argument or determine which answer Must Be True?).

In very rough terms, the part at the start of the arrow is taken for granted and the part at the end of the arrow is under suspicion. While this characterization may sound a bit vague, this occurs because there are four different types of relationships, and the details vary from type to type.

Part of the purpose of classifying questions into these four categories is to understand the fundamental structure of Critical Reasoning problems. Many students ask the following two questions upon seeing Critical Reasoning questions for the first time:

1. Should I simply accept every statement in the stimulus as true?
2. Can the answer choices bring in information that is off-the-page, that is, ideas and concepts not stated in the stimulus?

The answer to both questions depends on the question stem and corresponding question family. Let us examine each question family and address these questions in more detail.

The First Question Family

The First Question Family is based on the principle of using the information in the stimulus to prove that one of the answer choices must be true.

In the First Family diagram, the arrow points downward from the stimulus to the answer choices. Hence, the stimulus is at the start of the arrow, and the answer choices are at the end of the arrow. According to the rules above, whatever is stated in the stimulus is simply accepted as given, with no additional information being added. And, because the arrow points to the answer choices, the answer choices are “under suspicion,” and the information in the stimulus is used to prove one of the answer choices correct.

Because the stimulus is accepted as stated (even if it contains an error of reasoning), you cannot bring in additional information off the page—you can

One of the signature features of the three question families is that they define the parameters of what you can do with the information in each question.

only use what is stated in the stimulus. Thus, in a Must Be True question, only what the author states in the stimulus can be used to prove one of the answer choices. This reveals the way the arrow works: you start at the stimulus and then use only that information to separate the answers. If an answer choice references something that is not included or encompassed by the stimulus, it will be incorrect. In a Method of Reasoning question, for example, the process works the same. If one of the answers references some method of argumentation that did not occur in the stimulus, then the answer is automatically incorrect. The test makers do not hide this relationship. Most question stems in this family (especially Must Be True) will contain a phrase similar to, "The information *above, if true...*" (italics added). In this way the test makers are able to indicate that you should accept the statements in the stimulus as given and then use them to prove one of the answer choices.

The following rules apply to the First Question Family:

1. You must accept the stimulus information—even if it contains an error of reasoning—and use it to prove that one of the answer choices must be true.
2. Any information in an answer choice that does not appear either directly in the stimulus or as a combination of items in the stimulus will be incorrect.

These rules will be revisited in more detail once we begin analyzing individual Critical Reasoning questions.

The Second Question Family

The Second Question Family is based on the principle of assisting or helping the author's argument or statement in some way, whether by revealing an assumption of the argument, by resolving a paradox, or in some other fashion.

As opposed to the First Family, in this family the arrow points upward to the stimulus. This reverses the flow of information: the answer choices are at the start of the arrow, and the stimulus is at the end of the arrow. Functionally, this means you must accept the answer choices as given, and the stimulus is under suspicion. Accepting the answer choices as given means you cannot dispute their factual basis, even if they include elements not mentioned in the stimulus (we often call this "new" or "outside" information). The test makers make this principle clear because most question stems in this family contain a phrase similar to, "Which of the *following, if true...*" (italics added). By including this phrase, the test makers indicate that they wish you to treat each answer choice as factually correct. Your task is to examine each answer choice and see which one best fits the exact criteria stated in the question stem (strengthen, resolve, etc.).

In this question grouping, the stimulus is under suspicion. Often there are errors of reasoning present, or leaps in logic, and you are asked to find an answer choice that closes the hole. When you encounter a question of this category, immediately consider the stimulus—were there any obvious holes or gaps in the argument that could be filled by one of the answer choices? Often you will find that the author has made an error of reasoning and you will be asked to eliminate that error.

The following rules apply to the Second Question Family:

1. The information in the stimulus is suspect. There are often reasoning errors present, and depending on the question, you will help shore up the argument in some way.
2. The answer choices are accepted as given, even if they include “new” information. Your task is to determine which answer choice best meets the question posed in the stem.

The Third Question Family

The Third Question Family consists of only one question type—Weaken. Accordingly, you are asked to attack the author’s argument.

Compared to the Second Question Family, the only difference between the diagrams is that the third family diagram has a bar across the arrow. This bar signifies a negative: instead of strengthening or helping the argument, you attack or hurt the argument. In this sense the third family is the polar opposite of the second family; otherwise the two question families are identical.

For the Third Question Family, the following rules apply:

1. The information in the stimulus is suspect. There are often reasoning errors present, and you will further weaken the argument in some way.
2. The answer choices are accepted as given, even if they include “new” information. Your task is to determine which answer choice best attacks the argument in the stimulus.

As you might expect, there are deeper relationships between the individual question types and the question families. As we discuss the mechanics of individual questions we will further explore these relationships.

Those of you reading closely may have noticed that one of the question types was not listed among the Families. Evaluate the Argument questions are a combination of the second and third question families, and we will explain those questions in more detail in Chapter Thirteen.

Question Type Notes

The following is a collection of notes regarding the Ten Question Types. These notes help clear up some questions that typically arise when students are learning to identify the question types. In the chapters that discuss each question type we will reintroduce each of these points.

- Must Be True and Resolve the Paradox questions are generally connected to stimuli that do *not* contain conclusions. All remaining question types must be connected to stimuli with conclusions (unless a conclusion is added by the question stem, as sometimes occurs). Hence, when a stimulus without a conclusion appears on the GMAT, only two types of questions can be posed to you: Must Be True or Resolve the Paradox. Question types such Weaken or Method of Reasoning do not generally appear because no argument or reasoning is present, and those question types ask you to address reasoning. Generally, Resolve the Paradox questions are easy to spot because they contain a paradox or discrepancy. Thus, if you encounter a stimulus without a conclusion and without a paradox, you are most likely about to see a Must Be True question stem.
- Weaken and Strengthen are polar opposite question types, and both are often based on flawed or weak arguments that contain holes that must be closed or opened further.
- Method of Reasoning and Flaw in the Reasoning questions are a brother/sister pair. The only difference between the two is that Flaw in the Reasoning question stems explicitly note that the stimulus contains an error of reasoning. In a Method of Reasoning question the stimulus contains valid or invalid reasoning.
- Parallel Reasoning questions are a one-step extension of Method of Reasoning questions in that you must first identify the type of reasoning used and then parallel it. Method of Reasoning and Parallel Reasoning questions both have a strong Must Be True element.
- Main Point, Method of Reasoning, Flaw in the Reasoning, Parallel Reasoning, and Evaluate the Argument appear the *least* frequently on the GMAT.

Question Type Variety

One of the aims of the test makers is to keep you off-balance. An unsettled, frustrated test taker is prone to making mistakes. By mixing up the types of questions you face, the makers of the test can keep you from getting into a rhythm. Imagine how much easier the Critical Reasoning questions would be if you faced only Must Be True questions. For this reason, you will always see a spread of question types among the Critical Reasoning questions, and you will rarely see the same question type twice in a row. Since this situation is a fact of the GMAT, before the test begins prepare yourself mentally for the quick shifting of mental gears that is required to move from question to question.

"Most" in Question Stems

Many question stems—especially Strengthen and Weaken stems—contain the qualifier "most." For example, a typical question stem will state, "Which one of the following, if true, most weakens the argument above?" Astute test takers realize that the presence of "most" opens up a Pandora's box of sorts: by including "most," there is a possibility that other answer choices will also meet the criteria of the question stem (Strengthen, Weaken, etc.), albeit to a lesser extent. In other words, if a question stem says "most weakens," the possibility is that every answer choice weakens the argument and you would be in the unenviable task of having to choose the best of a bunch of good answer choices. *Fortunately, this is not how it works.* Even though "most" will appear in many stems, you can rest assured that only one answer choice will meet the criteria. So, if you see a "most weakens" question stem, only one of the answers will weaken the argument. So, then, why does "most" appear in so many question stems? Because in order to maintain test integrity the test makers need to make sure their credited answer choice is as airtight and defensible as possible. Imagine what would occur if a question stem, let us say a Weaken question, did not include a "most" qualifier: any answer choice that weakened the argument, even if only very slightly, could then be argued to meet the criteria of the question stem. A situation like this would make constructing the test exceedingly difficult because any given problem might have multiple correct answer choices. To eliminate this predicament, the test makers insert "most" into the question stem, and then they can always claim there is one and only one correct answer choice.

Of course, every once in a while two answer choices achieve the desired goal; in those cases you simply choose the better of the two answers. Normally, the difference between the two answers is significant enough for you to make a clear distinction as to which one is superior.

Identify the Question Stem Drill

Each of the following items contains a question stem. In the space provided, categorize each stem into one of the ten Critical Reasoning Question Types: Must Be True, Main Point, Assumption, Strengthen, Resolve the Paradox, Weaken, Method of Reasoning, Flaw in the Reasoning, Parallel Reasoning, or Evaluate the Argument. While we realize that you have not yet worked directly with each question type, by considering the relationships now you will have an advantage as you attack future questions. In later chapters we will present more Identify the Question Stem drills to further strengthen your abilities.

Answers on Page 60

1. Question Stem: "Which of the following, if true, most helps to explain the viewpoint described above?"

Question Type: _____

2. Question Stem: "Which of the following can be properly inferred from the historian's statement?"

Question Type: _____

3. Question Stem: "Which of the following, if true, most seriously weakens the reasoning above?"

Question Type: _____

4. Question Stem: "Which of the following is an assumption required by the argument above?"

Question Type: _____

5. Question Stem: "Which of the following is most like the argument above in its logical structure?"

Question Type: _____

6. Question Stem: "Of the following, which one most accurately expresses the main point of the argument?"

Question Type: _____

Identify the Question Stem Drill

7. Question Stem: "Which of the following statements, if true, would provide the most support for the scientists' assertion?"

Question Type: _____

8. Question Stem: "The argument is flawed because it"

Question Type: _____

9. Question Stem: "The advertisement proceeds by"

Question Type: _____

10. Question Stem: "The answer to which of the following questions would most help in evaluating the columnist's argument?"

Question Type: _____

11. Question Stem: "Mary challenges Shaun's reasoning by"

Question Type: _____

12. Question Stem: "The statements above, if true, most strongly support which of the following?"

Question Type: _____

Identify the Question Stem Drill Answer Key

The typical student misses about half of the questions in this drill. Do not worry about how many you miss; the point of this drill is to acquaint you with the different question stems. As you see more examples of each type of question, your ability to correctly identify each stem will improve.

1. Question Type: Resolve the Paradox

The presence of the phrase “Which of the following, if true,” indicates that this question stem must be from either the second or third question family. Because the third family is Weaken, and the question stem asks you to “explain,” the question cannot be from the third family. Thus, the question must be from the second family and can only be an Assumption, Strengthen, or Resolve question. The idea of explaining is most closely aligned with Resolving the Paradox.

2. Question Type: Must Be True

The word “inferred” means “must be true,” hence that is the classification of this question.

3. Question Type: Weaken

The presence of the phrase “Which of the following, if true,” indicates that this question stem must be from either the second or third question family. The presence of the word “weakens” indicates that this is a Weaken question.

4. Question Type: Assumption

The key words in this stem are “required” and “assumption,” making this an Assumption question.

5. Question Type: Parallel

The key phrases in this stem are “most like...in logical structure” and “the argument above.” Because the argument in the stimulus is used as a model for one of the answers, this is a Parallel Reasoning question.

6. Question Type: Main Point

Because the stem asks you to find the main point, this question is categorized as Main Point.

7. Question Type: Strengthen

The presence of the phrase “Which one of the following, if true,” indicates that this question stem must be from either the second or third question family. Because the third family is Weaken, and the question stem asks you to “support,” the question cannot be from the third family. Thus, the question must be from the second family and can only be an Assumption, Strengthen, or Resolve question. The idea of supporting is the same as Strengthening.

Identify the Question Stem Drill Answer Key

8. Question Type: Flaw

The presence of the word “flawed” could indicate either a Weaken question or a Flaw in the Reasoning question. In this case, the stem requests you to identify the flaw in the argument (or reasoning), hence this question is a Flaw in the Reasoning question.

9. Question Type: Method

By asking how the advertisement “proceeds,” the test makers wish to know the way in which the argument is made, in other words, the method of the reasoning.

10. Question Type: Evaluate

The key phrase is “evaluating the columnist’s argument,” which indicates that the test makers require you to find the question that would best help in evaluating the author’s argument. Thus, the question is classified as Evaluate the Argument.

11. Question Type: Method

Although the question stem uses the word “challenges,” this is not a Weaken question because the stem asks for a description of the way Anne’s reasoning was challenged. Thus, you are asked to identify Mary’s method of reasoning.

12. Question Type: Must Be True

The phrase “The statements above, if true,” indicates that this question must come from either the first or fourth question family. In this case, the “most strongly support” is used with the intent of proving one of the answers as correct. Hence, this is a Must Be True question. Note how the use of the word “support” in this question stem differs from the usage in problem #7.

"Except" and "Least" in Question Stems

The true effect of "except" is to logically negate the question stem. We will discuss Logical Negation in more detail in the Assumption question chapter.

The word "except" has a dramatic impact when it appears in a question stem. Because "except" means "other than," when "except" is placed in a question it negates the logical quality of the answer choice you seek. Literally, it turns the intent of the question stem upside down. For example, if a question asks you to weaken the argument, the one correct answer weakens the argument and the other four answers do not weaken the argument. If "except" is added to the question stem, as in "Each of the following weakens the argument EXCEPT," the stem is turned around and instead of the correct answer weakening the argument, the four incorrect answers weaken the argument and the one correct answer does not weaken the argument.

Many students, upon encountering "except" in a question stem, make the mistake of assuming that the "except" charges you with seeking the polar opposite. For example, if a question stem asks you to weaken the argument, some students believe that a "Weaken EXCEPT" question stem actually asks you to strengthen the argument. This is incorrect. Although weaken and strengthen are polar opposites, because except means "other than," when a "Weaken EXCEPT" question stem appears, you are asked to find any answer choice other than Weaken. While this could include a strengthening answer choice, it could also include an answer choice that has no effect on the argument. Thus, in a "Weaken EXCEPT" question, the four incorrect answers Weaken the argument and the one correct answer does not weaken the argument (could strengthen or have no effect). Here are some other examples:

1. "Which of the following, if true, strengthens the argument above?"

One correct answer: Strengthen

Four incorrect answers: Do not Strengthen

"Each of the following, if true, strengthens the argument above EXCEPT:"

One correct answer: Does not Strengthen

Four incorrect answers: Strengthen

2. "Which of the following, if true, would help to resolve the apparent discrepancy above?"

One correct answer: Resolves the Paradox

Four incorrect answers: Do not Resolve the Paradox

"Each of the following, if true, would help to resolve the apparent discrepancy above EXCEPT."

One correct answer: Does not Resolve the Paradox

Four incorrect answers: Resolve the Paradox

As you can see from the two examples, the presence of except has a profound impact upon the meaning of the question stem. Because "except" has this powerful effect, it always appears in all capital letters whenever it is used in an GMAT question stem.

The word "least" has a similar effect to "except" when it appears in a question stem. Although "least" and "except" do not generally have the same meaning, when "least" appears in a question stem you should treat it *exactly the same* as "except." Note: this advice holds true only when this word appears in the question stem! If you see the word "least" elsewhere on the GMAT, consider it to have its usual meaning of "in the lowest or smallest degree."

Let us look more closely at how and why "least" functions identically to "except." Compare the following two question stems:

"Which of the following, if true, would help to resolve the apparent discrepancy above?"

One correct answer: Resolves the Paradox

Four incorrect answers: Do not Resolve the Paradox

"Which of the following, if true, helps LEAST to resolve the apparent discrepancy described above?"

One correct answer: Does not Resolve the Paradox

Four incorrect answers: Resolve the Paradox

By asking for the question stem that "least" helps resolve the paradox, the test makers indicate that the four incorrect answers will more strongly help resolve the paradox. But, in practice, when "least" is used, all five answer choices do *not* resolve the paradox to varying degrees. Instead, four answers resolve the paradox and the one correct answer does *not* resolve the paradox. Why do the test makers do this? Because the test makers cannot afford to introduce uncertainty into the correctness of the answers. If all five answer choices resolve the paradox, then reasonable minds could come to a disagreement about which

Some GMAT Critical Reasoning sections feature "except" questions very heavily, especially as you encounter higher-difficulty problems.

"Except" is used far more frequently in GMAT question stems than "least."

one “least” resolves the paradox. In order to avoid this type of controversy, the test makers simply make sure that exactly one answer choice does not resolve the paradox (and, because that answer choice does not resolve the paradox it automatically has the “least” effect possible). In this way, the test makers can present a seemingly difficult and confusing task while at the same time avoiding a test construction problem. Because of this situation, any time you encounter “least” in a question stem, simply recognize that four of the answers will meet the stated criteria (weaken, strengthen, resolve, etc.) and the one correct answer will not. Thus, you will not have to make an assessment based on degree of correctness.

Here is another example comparing the use of the word “least.”

“Which one of the following, if true, would most strengthen the argument above?”

One correct answer: Strengthen
Four incorrect answers: Do not Strengthen

“Which one of the following, if true, LEAST strengthens the argument above?”

One correct answer: Does not Strengthen
Four incorrect answers: Strengthen

Because “least,” like “except,” has such a strong impact on the meaning of a question stem, the test makers kindly place “least” in all capital letters when it appears in a question stem.

In the answer keys to this book, we will designate questions that contain “except” or “least” by placing an “X” at the end of the question stem classification. For example, a “Weaken EXCEPT” question stem would be classified as “WeakenX.” A “Strengthen EXCEPT” question stem would be classified as “StrengthenX” and so on.

Except and Least Identify the Question Stem Mini-Drill

Each of the following items contains a question stem. In the space provided, categorize each stem into one of the ten Critical Reasoning Question Types: Must Be True, Main Point, Assumption, Strengthen, Resolve the Paradox, Weaken, Method of Reasoning, Flaw in the Reasoning, Parallel Reasoning, or Evaluate the Argument, and notate any Except (X) identifier you see. *Answers on Page 66*

1. Question Stem: "Each of the following, if true, supports the claim above EXCEPT:"

Question Type: _____

2. Question Stem: "Each of the following, if true, weakens the conclusion above EXCEPT:"

Question Type: _____

3. Question Stem: "Which one of the following, if all of them are true, is LEAST helpful in establishing that the conclusion above is properly drawn?"

Question Type: _____

4. Question Stem: "Each of the following describes a flaw in the psychologist's reasoning EXCEPT:"

Question Type: _____

5. Question Stem: "Which one of the following, if true, does NOT help to resolve the apparent discrepancy between the safety report and the city's public safety record?"

Question Type: _____

Except and Least Identify The Question Stem Mini-Drill Answer Key

1. Question Type: StrengthenX

The four incorrect answer choices Strengthen the argument; the correct answer choice does not Strengthen the argument.

2. Question Type: WeakenX

The four incorrect answer choices Weaken the argument; the correct answer choice does not Weaken the argument.

3. Question Type: StrengthenX

The four incorrect answer choices Strengthen the argument ("helpful in establishing the conclusion" is the same as Strengthen); the correct answer choice does not Strengthen the argument. The "LEAST" in the stem functions in the same fashion as "EXCEPT."

4. Question Type: FlawX

The four incorrect answer choices describe a Flaw in the Reasoning; the correct answer choice does not describe a Flaw in the Reasoning.

5. Question Type: ResolveX

Although this question stem uses neither "except" nor "least," the use of the word "NOT" indicates that the four incorrect answer choices Resolve the Paradox and the correct answer choice does not Resolve the Paradox. Hence, this question is classified ResolveX.

Prephrasing Answers

Most students tend to simply read the question stem and then move on to the answer choices without further thought. This is disadvantageous because these students run a greater risk of being tempted by the expertly constructed incorrect answer choices. One of the most effective techniques for quickly finding correct answer choices and avoiding incorrect answer choices is prephrasing.

Prephrasing an answer involves quickly speculating on what you expect the correct answer will be based on the information in the stimulus.

Although every answer you prephrase may not be correct, there is great value in considering for a moment what elements could appear in the correct answer choice. Students who regularly prephrase find that they are more readily able to eliminate incorrect answer choices, and of course, many times their prephrased answer is correct. And, as we will see in later chapters, there are certain stimulus and question stem combinations on the GMAT that yield predictable answers, making prephrasing even more valuable. In part, prephrasing puts you in an attacking mindset: if you look ahead and consider a possible answer choice, you are forced to involve yourself in the problem. This process helps keep you alert and in touch with the elements of the problem.

Primary Objective #6: Prephrase: after reading the question stem, take a moment to mentally formulate your answer to the question stem.

Keep in mind that prephrasing is directly related to attacking the stimulus; typically, students who closely analyze the stimulus can more easily prephrase an answer.

Prephrasing is the GMAT version of the old adage, "An ounce of prevention is worth a pound of cure."

All high-scoring test takers are active and aggressive. Passive test takers tend to be less involved in the exam and therefore more prone to make errors.

When we speak of opposites on the GMAT, we mean logical opposites. For example, what is the opposite of "wet?" Most people would say "dry." But, that is the polar opposite, not the logical opposite. The logical opposite of "wet" is "not wet." Logical opposites break the topic under discussion into two parts. In this case, everything in the spectrum of moisture would be classified as either "wet" or "not wet."

There may be times when you would not read all five answer choices, for example, if you only a short amount of time left in the section and you determine that answer choice (B) is clearly correct. In that case, you would choose answer choice (B) and then move on to the next question.

The Answer Choices

All GMAT questions have five answer choices and each question has only one correct, or "credited," response. As with other sections, the correct answer in a Critical Reasoning question must meet the Uniqueness Rule of Answer Choices™, which states that "Every correct answer has a unique logical quality that meets the criteria in the question stem. Every incorrect answer has the opposite logical quality." The correctness of the answer choices themselves conforms to this rule: there is one correct answer choice; the other four answer choices are the opposite of correct, or incorrect. Consider the following specific examples:

1. Logical Quality of the Correct Answer: Must Be True
Logical Quality of the Four Incorrect Answers:
the opposite of Must Be True = Not Necessarily True (could be not necessarily the case or never the case)
2. Logical Quality of the Correct Answer: Strengthen
Logical Quality of the Four Incorrect Answers:
the opposite of Strengthen = not Strengthen (could be neutral or weaken)
3. Logical Quality of the Correct Answer: Weaken
Logical Quality of the Four Incorrect Answers:
the opposite of Weaken = not Weaken (could be neutral or strengthen)

Even though there is only one correct answer choice and this answer choice is unique, you still are faced with a difficult task when attempting to determine the correct answer. The test makers have the advantage of time and language on their side. Because identifying the correct answer at first glance can be quite hard, you must always read all five of the answer choices. Students who fail to read all five answer choices open themselves up to missing questions without ever having read the correct answer. There are many classic examples of GMAC placing highly attractive wrong answer choices just before the correct answer. If you are going to make the time investment of analyzing the stimulus and the question stem, you should also make the wise investment of considering each answer choice.

Primary Objective #7: Always read each of the five answer choices.

As you read through each answer choice, sort them into contenders and losers. If an answer choice appears somewhat attractive, interesting, or even confusing, keep it as a contender and move on to the next answer choice. You do not want to spend time debating the merits of an answer choice only to find

that the next answer choice is superior. However, if an answer choice immediately strikes you as incorrect, classify it as a loser and move on. Once you have evaluated all five answer choices, return to the answer choices that strike you as most likely to be correct and decide which one is correct.

Primary Objective #8: Separate the answer choices into Contenders and Losers. After completing this process, review the contenders and decide which answer is the correct one.

The Contender/Loser separation process is exceedingly important, primarily because it saves time. Consider two students—1 and 2—who each approach the same question, one of whom uses the Contender/Loser approach and the other who does not. Answer choice (D) is correct:

Student 1 (using Contender/Loser)

Answer choice A: considers this answer for 15 seconds, keeps it as a Contender.

Answer choice B: considers this answer for 10 seconds, eliminates it as a Loser.

Answer choice C: considers this answer for 20 seconds, eliminates it as a Loser.

Answer choice D: considers this answer for 20 seconds, keeps it as a Contender, and mentally notes that this answer is preferable to (A).

Answer choice E: considers this answer for 15 seconds, would normally keep as a contender, but determines answer choice (D) is superior.

After a quick review, Student 1 selects answer choice (D) and moves to the next question. Total time spent on the answer choices: 1 minute, 20 seconds (irrespective of the time spent on the stimulus).

Student 2 (considering each answer choice in its entirety)

Answer choice A: considers this answer for 15 seconds, is not sure if the answer is correct or incorrect. Returns to stimulus and spends another 20 seconds proving the answer is wrong.

Answer choice B: considers this answer for 10 seconds, eliminates it.

Answer choice C: considers this answer for 20 seconds, eliminates it.

Answer choice D: considers this answer for 20 seconds, notes this a good answer, then spends an additional 10 seconds returning to the stimulus to prove the answer correct.

Answer choice E: considers this answer for 15 seconds, but determines answer choice (D) is superior.

After a quick review, Student 2 selects answer choice (D) and moves to

Some companies assert that only two of the five answer choices have merit. This type of "rule" is valueless because only one answer choice can be correct; the other four answers can be eliminated for concrete and identifiable reasons.

the next question. Total time spent on the answer choices: 1 minute, 50 seconds.

Comparison: both students answer the problem correctly, but Student 2 takes 30 more seconds to answer the question than Student 1.

Some students, on reading this comparison, note that both students answered the problem correctly and that the time difference was small, only 30 seconds more for Student 2 to complete the problem. Doesn't sound like that big a difference, does it? But, the extra 30 seconds was for just one problem. Imagine if that same thing occurred on every single Critical Reasoning problem in the section: that extra 30 seconds per question would translate to a loss of 5 to 7 minutes when multiplied across 10 to 14 questions in the section! And that lost time would mean that student 2 would get to several questions than Student 1 in this section. This example underscores an essential GMAT truth: little things make a big difference, and every single second counts. If you can save even five seconds by employing a certain method, then do so!

Occasionally, students will read and eliminate all five of the answer choices. If this occurs, return to the stimulus and re-evaluate the argument. Remember—the information needed to answer the question always resides in the stimulus, either implicitly or explicitly. If none of the answers are attractive, then you must have missed something key in the stimulus.

Primary Objective #9: If all five answer choices appear to be Losers, return to the stimulus and re-evaluate the argument.

Question Approach Review

Take a moment to review the methods discussed in Chapters Two and Three. Together, these recommendations form a cohesive strategy for attacking any Critical Reasoning question. Let us start by reviewing the Primary Objectives™.

Primary Objective #1: Determine whether the stimulus contains an argument or if it is only a set of factual statements.

Primary Objective #2: If the stimulus contains an argument, identify the conclusion of the argument. If the stimulus contains a fact set, examine each fact.

Primary Objective #3: If the stimulus contains an argument, determine if the argument is strong or weak.

Primary Objective #4: Read closely and know precisely what the author said. Do not generalize!

Primary Objective #5: Carefully read and identify the question stem. Do not assume that certain words are automatically associated with certain question types.

Primary Objective #6: Prephrase: after reading the question stem, take a moment to mentally formulate your answer to the question stem.

Primary Objective #7: Always read each of the five answer choices.

Primary Objective #8: Separate the answer choices into Contenders and Losers. After you complete this process, review the Contenders and decide which answer is the correct one.

Primary Objective #9: If all five answer choices appear to be Losers, return to the stimulus and re-evaluate the argument.

As you attack each problem, remember that each question stem governs the flow of information within the problem:

- The First family uses the stimulus to prove one of the answer choices must be true. No information outside the sphere of the stimulus is allowed in the correct answer choice.
- The Second Family takes the answer choices as true and uses them to help the stimulus. Information outside the sphere of the stimulus is allowed in the correct answer choice.

Memorize this process and make it second nature! These steps constitute the basic approach you must use to attack each question.

- The Third Family takes the answer choices as true and uses them to hurt the stimulus. Information outside the sphere of the stimulus is allowed in the correct answer choice.

By consistently applying the points above, you give yourself the best opportunity to succeed on each question.

Final Chapter Note

The individuals who construct standardized tests are called *psychometricians*. Although this job title sounds ominous, breaking this word into its two parts reveals a great deal about the nature of the GMAT. Although we could make a number of jokes about the *psycho* part, this portion of the word refers to psychology; the *metrician* portion relates to metrics or measurement. Thus, the purpose of these individuals is to create a test that measures you in a precise, psychological way. As part of this process, the makers of the GMAT carefully analyze reams of data from every test administration in order to assess the tendencies of test takers. As Sherlock Holmes observed, "You can, for example, never foretell what any one man will do, but you can say with precision what an average number will be up to." By studying the actions of all past test takers, the makers of the exam can reliably predict where you will be most likely to make errors. Throughout this book we will reference those pitfalls as they relate to specific question and reasoning types. For the moment, we would like to highlight one mental trap you must avoid at all times in any GMAT section: the tendency to dwell on past problems. Many students fall prey to "answering" a problem, and then continuing to think about it as they start the next problem. Obviously, this is distracting and creates an environment where missing the next problem is more likely. When you finish a problem, you must immediately put it out of your mind and move to the next problem with 100% focus. If you let your mind wander back to previous problems, you fall into a deadly trap.

This concludes our general discussion of Critical Reasoning questions. In subsequent chapters we will deconstruct each question type and some of the reasoning types frequently used by the test makers. At all times we will use the principles presented in these first chapters. If, in the future, you find yourself unclear about some of these ideas, please return to these chapters and re-read them.

If you feel as if you are still hazy on some of the ideas discussed so far, do not worry. When discussing the theory that underlies all questions, the points can sometimes be a bit abstract and dry. In the remaining chapters we will discuss the application of these ideas to real questions, and working with actual questions often helps a heretofore confusing idea become clear.

C

CHAPTER FOUR: MUST BE TRUE QUESTIONS

Must Be True Questions

Must Be True questions require you to select an answer choice that is proven by the information presented in the stimulus. The correct answer choice can be a paraphrase of part of the stimulus or it can be a logical consequence of one or more parts of the stimulus. However, when selecting an answer choice, you must find the proof that supports your answer in the stimulus. We call this the Fact Test™:

The correct answer to a Must Be True question can always be proven by referring to the facts stated in the stimulus.

The test makers will try to entice you by creating incorrect answer choices that could possibly occur or are likely to occur, but are not certain to occur. You must avoid those answers and select the answer choice that is most clearly supported by what you read. Do not bring in information from outside the stimulus (aside from commonsense assumptions); all of the information necessary to answer the question resides in the stimulus.

Must Be True question stems appear in a variety of formats, but one or both of the features described below appear consistently:

1. The stem often indicates the information in the stimulus should be taken as true, as in:

“If the statements above are true...”

“The statements above, if true...”

“If the information above is correct...”

This type of phrase helps indicate that you are dealing with a First Family question type.

2. The stem asks you to identify a single answer choice that is proven or supported, as in:

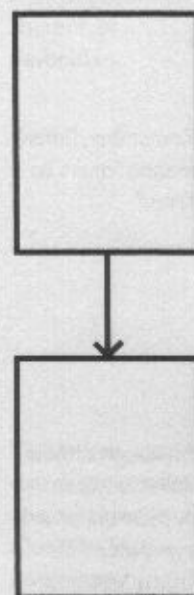
“...which of the following must also be true?”

“...which of the following conclusions can be properly drawn on the basis of it?”

“...most strongly support which of the following?”

“Which of the following can be properly inferred...”

First Family
Information
Model:



Because Must Be True is the first question type under discussion, we will make test-taking comments that relate to other question types as well.

In each case, the question stem indicates that one of the answer choices is proven by the information in the stimulus.

Here are several Must Be True question stem examples:

“If the statements above are true, which of the following must be true?”

“Which of the following conclusions is best supported by the statements above?”

“The statements above, if true, best support which of the following assertions?”

“Which of the following can be correctly inferred from the statements above?”

“Which of the following is most strongly supported by the information above?”

Remember, “infer” means “must be true.”

Although difficult questions can appear under any type, Must Be True questions are often considered one of the easier question types.

Must Be True questions are considered the foundation of the GMAT because the skill required to answer a Must Be True question is also required for every other GMAT Critical Reasoning question. Must Be True questions require you to read text and understand the facts and details that logically follow. To Weaken or Strengthen an argument, for example, you first need to be able to ascertain the facts and details. The same goes for every other type of question. Because every question type relies on the fact-finding skill used to answer Must Be True questions, your performance on Must Be True questions is often a predictor of your overall Critical Reasoning score. For this reason you must lock down the understanding required of this question category: what did you read in the stimulus and what do you know on the basis of that reading?

Prephrasing with Must Be True Questions

When you read an argument, you are forced to evaluate the validity of a conclusive statement generated by a framework designed to be persuasive (that is, after all, what argumentation is all about). When judging an argument, people tend to react with agreement or disagreement depending on the persuasiveness of the conclusion. Fact sets do not engender that same level of response because no argument is present, and, as mentioned in Chapter Two, most Must Be True stimuli are fact sets. Because prephrasing relies in part on your reaction to what you read, prephrasing Must Be True questions can often be difficult. There are exceptions, but if you find yourself having difficulty prephrasing an answer to a Must Be True question, do not worry.

The following question will be used to further discuss prephrasing. Please take a moment to read through the problem and corresponding answer choices:

1. Flavonoids are a common component of almost all plants, but a specific variety of flavonoid in apples has been found to be an antioxidant. Antioxidants are known to be a factor in the prevention of heart disease.

Which one of the following can be properly inferred from the passage?

- (A) A diet composed largely of fruits and vegetables will help to prevent heart disease.
- (B) Flavonoids are essential to preventing heart disease.
- (C) Eating at least one apple each day will prevent heart disease.
- (D) At least one type of flavonoid helps to prevent heart disease.
- (E) A diet deficient in antioxidants is a common cause of heart disease.

Applying Primary Objective #1 we can make the determination that since there is no conclusion in the stimulus, this is a fact set and not an argument. In this case the stimulus is short, and according to Primary Objective #2 can be broken down into three components:

First Statement: Flavonoids are a common component of almost all plants,

Second Statement: a specific variety of flavonoid in apples has been found to be an antioxidant.

Third Statement: Antioxidants are known to be a factor in the prevention of heart disease.

The question stem is obviously a Must Be True, and to prephrase (Primary Objective #6), take a moment to consider what the elements in the stimulus add up to. To do so, consider the premises together, and look for the connection between the elements: the first and second premises have "flavonoid" in common, and the second and third premises have "antioxidant" in common. Take a moment to examine each connection.

The flavonoid connection between the first two premises proves to be non-informative. The first premise indicates flavonoids appear frequently in plants and the second premise cites a specific instance in apples.

The antioxidant connection in the last two premises is more revealing. The second premise indicates that a flavonoid in apples is an antioxidant, and the third premise states that antioxidants are a factor in preventing heart disease.

Do not worry if you have never heard of a flavonoid. The question does not depend on your knowledge, or lack thereof, of flavonoids.

Remember, you can often predict the occurrence of Must Be True questions because the stimulus of most Must Be True questions does not contain a conclusion.

Review the Primary Objectives on page 71!

If you did not follow this exact pattern of analysis, or if you classified some answers as Contenders when we classified them as Losers, do not worry. Everyone has their own particular style and pace for attacking questions. The more questions you complete, the better you will get at understanding why answers are correct or incorrect.

The scope of the stimulus—especially if that scope is broad—often helps eliminate one or more of the answer choices.

Adding these two points together, we can deduce that the specific flavonoid in apples is a factor in preventing heart disease. Since that statement must be true based on the premises, we can attack the five answer choices with this prephrase in mind. Note that if you did not see that connection between the premises, you would simply move on and attack each answer choice with the facts at hand.

Answer choice (A): This is an interesting answer choice, and most people take a moment before categorizing this as a Loser. The answer choice *could be true*, but it is too broad to be supported by the facts: nowhere are we told that a *diet* of fruits and vegetables will help prevent heart disease (and in this sense the answer fails the Fact Test). Perhaps apples are the only fruit with the antioxidant flavonoid and there is nothing beneficial about other fruits and vegetables. And, eating a diet of fruits and vegetables is no guarantee that the diet includes apples. Regardless, this answer choice can be especially attractive because it plays on the general perception that fruits and vegetables are good for you.

Answer choice (B): This answer is also a Loser. Nothing in the stimulus supports the rather strong statement that flavonoids are *essential* to preventing heart disease.

Answer choice (C): Many people hold this answer as a Contender and then move on to answer choice (D). As it will turn out, this answer is incorrect because the language is too strong: the stimulus only stated that apples contain an element that was a *factor* in preventing heart disease, not that they definitely *will* prevent heart disease.

Answer choice (D): This answer is the closest to our prephrase, and this is the correct answer. Notice how the language of this answer choice—"helps to prevent"—matches the stimulus language—"factor in the prevention."

Answer choice (E): This answer choice also could be true, but it cannot be correct because the stimulus makes no mention of the causes of heart disease. Just because an antioxidant can help prevent heart disease does not mean that a lack of antioxidants causes heart disease.

Notice how the scope of the stimulus plays a role in how we attack the answer choices. The language of the stimulus is relatively broad—"almost all," "factor in the prevention,"—and the author shies away from making definite statements. Because the stimulus does not contain much in the way of direct, absolute information, selecting an answer choice that contains a direct, absolute statement is difficult to justify. This reasoning helps us eliminate answer choices (B) and (C), both of which contain strong statements that are ultimately unsupportable (literally, they both fail the Fact Test because they are too strong).

Returning to the Stimulus

As you attack the answer choices, do not be afraid to return to the stimulus to re-read and confirm your perceptions. Most GMAT stimuli contain a large amount of tricky, detailed information, and it is difficult to gain a perfect understanding of many of the stimuli you encounter. There is nothing wrong with quickly looking back at the stimulus, especially when deciding between two or more answer choices.

This advice also holds true for Reading Comprehension questions.

Please note that there is a difference between returning to the stimulus and re-reading the entire stimulus. On occasion, you will find yourself with no other option but to re-read the entire passage, but this should not be your normal mode of operation.

Primary Objective #4 and Modifier Words Revisited

Primary Objective #4 states: "Read closely and know precisely what the author said. Do not generalize!" This is especially important in Must Be True questions because the details are all the test makers have to test you on. Consider the following stimulus:

In Must Be True questions you are like the detective Sherlock Holmes, looking for clues in the stimulus and then matching those clues to the answer choices.

2. The importance of the ozone layer to terrestrial animals is that it entirely filters out some wavelengths of light but lets others through. Holes in the ozone layer and the dangers associated with these holes are well documented. However, one danger that has not been given sufficient attention is that these holes could lead to severe eye damage for animals of many species.

When reading the stimulus, your eye should be drawn to the modifier and indicator words, which are underlined below:

The importance of the ozone layer to terrestrial animals is that it entirely filters out some wavelengths of light but lets others through. Holes in the ozone layer and the dangers associated with these holes are well documented. However, one danger that has not been given sufficient attention is that these holes could lead to severe eye damage for animals of many species.

The scope of the stimulus is relatively broad, and aside from the word "entirely," most of the modifiers are not absolute.

Now, look at the rest of the problem and see how several of the answer choices attempt to prey upon those who did not read the stimulus closely. Here are the question stem and corresponding answer choices for the stimulus above:

Words like "some," "could," and "many" encompass many different possibilities and are broad scope indicators. Words like "must" and "none" indicate a narrow scope.

2. The importance of the ozone layer to terrestrial animals is that it entirely filters out some wavelengths of light but lets others through. Holes in the ozone layer and the dangers associated with these holes are well documented. However, one danger that has not been given sufficient attention is that these holes could lead to severe eye damage for animals of many species.

Which one of the following is most strongly supported by the statements above, if they are true?

- (A) All wavelengths of sunlight that can cause eye damage are filtered out by the ozone layer where it is intact.
- (B) Few species of animals live on a part of the earth's surface that is not threatened by holes in the ozone layer.
- (C) Some species of animals have eyes that will not suffer any damage when exposed to unfiltered sunlight.
- (D) A single wavelength of sunlight can cause severe damage to the eyes of most species of animals.
- (E) Some wavelengths of sunlight that cause eye damage are more likely to reach the earth's surface where there are holes in the ozone layer than where there are not.

With the previous discussion in mind, let us analyze the answer choices:

Answer choice (A): The very first word—"all"—should be a red flag. Nowhere in the stimulus do we have support for stating that *all* damaging wavelengths are filtered out by the ozone layer. The stimulus only states that the ozone layer filters "some" wavelengths and lets others through. Some of those that are filtered are dangerous, as indicated by the last sentence. Surprisingly, about 10% of all test takers select this answer choice.

Answer choice (B): We know that many animal species could suffer severe eye damage, and from this we can infer that some of them live in areas threatened by the ozone layer. We do *not* know that few of the species live in non-threatened areas. Do not forget the Fact Test—it will eliminate any answer choice without support.

Answer choice (C): Nothing in the passage proves this answer choice. If you selected this answer thinking that "many" implied "not all," then you made a simple, correctable mistake. From a pure logic standpoint, "many" can include "all."

Answer choice (D): Again, watch those modifiers! One reason the answer choice is incorrect is because it references "most" species when the stimulus only discusses "many" species.

Answer choice (E): This is the correct answer. We can follow the chain of connections in the stimulus to prove this answer: the ozone layer filters some wavelengths of light; holes in the ozone layer are dangerous, but one previously overlooked danger of the holes is possible eye damage for many species. From these two statements we can infer that the holes must be letting some damaging wavelengths of light through. This is essentially what answer choice (E) states.

The lesson from this question is simple: read closely and pay strict attention to the modifiers used by the author. Even though you must read quickly, the test makers expect you to know exactly what was said, and they will include answer choices specifically designed to test whether you understood the details.

Correct Answers in Must Be True Questions Reviewed

Let us take a moment to review two types of answers that will always be correct in a Must Be True question.

1. Paraphrased Answers

Paraphrased Answers are answers that restate a portion of the stimulus in different terms. Because the language is not exactly the same as in the stimulus, Paraphrased Answers can be easy to miss. Paraphrased Answers are designed to test your ability to discern the author's exact meaning. Sometimes the answer can appear to be almost too obvious since it is drawn directly from the stimulus.

2. Answers that are the sum of two or more stimulus statements (Combination Answers)

Any answer choice that would result from combining two or more statements in the stimulus will be correct. The correct answer to the flavonoid question earlier in this chapter is an excellent example of this idea in action.

Should you encounter either of the above as answer choices in a Must Be True question, go ahead and select the answer with confidence.

Paraphrased answers occur primarily in Must Be True and Main Point questions. Some students have said they missed paraphrased answer choices because they did not feel the test makers would simply change the language of the text. They will

There are other classic GMAT tricks that we will discuss in this and future chapters.

Incorrect Answers in Must Be True Questions

There are several types of answers that appear in Must Be True questions that are incorrect. These answers appear frequently enough that we have provided a review of the major types below. Each answer category below is designed to attract you to an incorrect answer choice, and after this brief review we will examine several GMAT questions and analyze actual instances of these types of answers.

1. Could Be True or Likely to Be True Answers

Because the criteria in the question stem requires you to find an answer choice that Must Be True, answers that only could be true or are even likely to be true are incorrect. These answers are attractive because there is nothing demonstrably wrong with them (for example, they do not contain statements that are counter to the stimulus). Regardless, like all incorrect answers these answers fail the Fact Test. Remember, you must select an answer choice that must occur based on what you have read.

This category of incorrect answer is very broad, and some of the types mentioned below will fall under this general idea but place an emphasis on a specific aspect of the answer.

2. Exaggerated Answers

Exaggerated Answers take information from the stimulus and then stretch that information to make a broader statement that is not supported by the stimulus. In that sense, this form of answer is a variation of a could be true answer since the exaggeration is possible, but not proven based on the information. Here is an example:

If the stimulus states, “*Some* software vendors recently implemented more rigorous licensing procedures.”

An incorrect answer would exaggerate one or more of the elements: “*Most* software vendors recently implemented more rigorous licensing procedures.” In this example, *some* is exaggerated to *most*. While it could be true that most software vendors made the change, the stimulus does not prove that it must be true. This type of answer is often paraphrased, creating a deadly combination where the language is similar enough to be attractive but different enough to be incorrect.

Here is another example:

If the stimulus states, “Recent advances in the field of molecular biology make it *likely* that many school textbooks will be rewritten.”

The exaggerated and paraphrased version would be: "Many school textbooks about molecular biology will be re-written." In this example, *likely* has been dropped, and this omission exaggerates the certainty of the change. The paraphrase also is problematic because the stimulus referenced school textbooks whereas the paraphrased answer refers to school textbooks *about molecular biology*.

3. "New" Information Answers

Because correct Must Be True answers must be based on information in the stimulus or the direct result of combining statements in the stimulus, be wary of answers that present so-called new information—that is, information not mentioned explicitly in the stimulus. Although these answers can be correct when they fall under the umbrella of a statement made in the stimulus, they are often incorrect. For example, if a stimulus discusses the economic policies of Japan, be careful with an answer that mentions U.S. economic policy. Look closely at the stimulus—does the information about Japanese economic policy apply to the U.S., or are the test makers trying to get you to fall for an answer that sounds logical but is not directly supported? To avoid incorrectly eliminating a New Information answer, take the following two steps:

1. Examine the scope of the argument to make sure the "new" information does not fall within the sphere of a term or concept in the stimulus.
2. Examine the answer to make sure it is not the consequence of combining stimulus elements.

4. The Shell Game

The GMAT makers have a variety of psychological tricks they use to entice test takers to select an answer choice. One of their favorites is one we call the Shell Game: an idea or concept is raised in the stimulus, and then a very similar idea appears in the answer choice, but the idea is changed just enough to be incorrect but still attractive. This trick is called the Shell Game because it abstractly resembles those street corner gambling games where a person hides a small object underneath one of three shells, and then scrambles them on a flat surface while a bettor tries to guess which shell the object is under (similar to three-card Monte). The object of a Shell Game is to trick the bettor into guessing incorrectly by mixing up the shells so quickly and deceptively that the bettor mistakenly selects the wrong shell. The intent of the GMAT makers is the same.

Shell Game answers occur in all GMAT question types, not just Must Be True.

As we will see in later chapters, the Shell Game can also be played with elements in a stimulus.

5. The Opposite Answer

As the name suggests, the Opposite Answer provides an answer that is completely opposite of the stated facts of the stimulus. Opposite Answers are very attractive to students who are reading too quickly or carelessly. Because Opposite Answers appear quite frequently in Strengthen and Weaken questions, we will discuss them in more detail when we cover those question types.

6. The Reverse Answer

Here is a simplified example of how a Reverse Answer works, using italics to indicate the reversed parts:

The stimulus might state, “*Many* people have *some* type of security system in their home.”

An incorrect answer then reverses the elements: “*Some* people have *many* types of security systems in their home.”

The Reverse Answer is attractive because it contains familiar elements from the stimulus, but the reversed statement is incorrect because it rearranges those elements to create a new, unsupported statement.

Reverse Answers
can occur in any
type of question.

Idea Application: An Analysis of Correct and Incorrect Answers

In this section we analyze three Critical Reasoning questions. We will use the examples to discuss the various answer types you learned in the previous section.

Please take a moment to complete the following problem:

3. In an experiment, two-year-old boys and their fathers made pie dough together using rolling pins and other utensils. Each father-son pair used a rolling pin that was distinctively different from those used by the other father-son pairs, and each father repeated the phrase "rolling pin" each time his son used it. But when the children were asked to identify all of the rolling pins among a group of kitchen utensils that included several rolling pins, each child picked only the one that he had used.

Which one of the following inferences is most supported by the information above?

- (A) The children did not grasp the function of a rolling pin.
- (B) No two children understood the name "rolling pin" to apply to the same object.
- (C) The children understood that all rolling pins have the same general shape.
- (D) Each child was able to identify correctly only the utensils that he had used.
- (E) The children were not able to distinguish the rolling pins they used from other rolling pins.

The "rolling pin" problem above lured many people to incorrectly select answer choice (D), a Shell Game answer. Answer choice (D) looks perfect at first glance, but the author never indicated that the children could identify only the *utensils* that they used. Rolling pins, yes; utensils, no. The correct answer choice is (B), which many test takers quickly pass over. Let's examine each answer:

Answer choice (A): From the text, it seems possible that the children did understand the function of a rolling pin; certainly, they were able to identify the rolling pin they used.

Answer choice (B): This is the correct answer choice. The answer must be true because we know that despite being asked to identify all the rolling pins, each child selected *only* the rolling pin he had used. No two children picked the same rolling pin and therefore no two children understood the name "rolling pin" to apply to the same object.

Answer choice (C): Apparently not, otherwise logic would say the children

Shell Game answers are exceedingly dangerous because, when selected, not only do you miss the question but you walk away thinking you got it right. This misperception makes it difficult to accurately assess your performance after the test.

would pick other rolling pins aside from the one they used.

Answer choice (D): Do not be concerned if you fell into this trap, but consider it a lesson for the future. The test makers smoothly slip “utensils” into the answer choice, and most students make the mistake of equating utensils with rolling pins. Yes, a rolling pin is a utensil, but there are other utensils as well, and the stimulus does not give us information about whether the children could identify those utensils. This is the essence of the Shell Game: you expect one thing and the test makers slip something quite similar but essentially different into its place.

Answer choice (E): This is an Opposite Answer. As indicated by the final sentence of the stimulus, the children were able to distinguish the rolling pin they used from the other rolling pins. This circumstance is exactly opposite of that stated in answer choice (E), which declares, “The children were *not* able to distinguish...” In this case, if you miss the “not,” this answer choice is very attractive.

Let’s continue looking at the way answers are constructed. Please take a moment to complete the following problem:

4. The increasing complexity of scientific inquiry has led to a proliferation of multiauthored technical articles. Reports of clinical trials involving patients from several hospitals are usually coauthored by physicians from each participating hospital. Likewise, physics papers reporting results from experiments using subsystems developed at various laboratories generally have authors from each laboratory.

If all of the statements above are true, which one of the following must be true?

- (A) Clinical trials involving patients from several hospitals are never conducted solely by physicians from just one hospital.
- (B) Most reports of clinical trials involving patients from several hospitals have multiple authors.
- (C) When a technical article has multiple authors, they are usually from different institutions.
- (D) Physics papers authored by researchers from multiple laboratories usually report results from experiments using subsystems developed at each laboratory.
- (E) Most technical articles are authored solely by the researchers who conducted the experiments these articles report.

Answer choice (A): The stimulus never discusses who *conducts* the studies, only who authors the reports. Thus, there is no proof for this answer choice and it fails the Fact Test. Even if you mistook “conducted” for “reported,” the answer choice is still incorrect because the stimulus indicates that reports involving patients from several hospitals are *usually* coauthored by physicians from each hospital. Although “usually” could mean “always,” it does not have to, and hence it is possible that a clinical trial could be reported by physicians from just one hospital.

Answer choice (B): This answer choice is a direct paraphrase of the second sentence. The second sentence states, “Reports of clinical trials involving patients from several hospitals are usually coauthored by physicians from each participating hospital.” Answer choice (B) translates “usually” into “most,” and “coauthored by physicians from each participating hospital” into “multiple authors.” Thus, the answer choice passes the Fact Test and is correct.

Answer choice (C): This is a Shell Game answer choice. Although the stimulus says there has been a proliferation of multiauthored technical articles, no comment is made about the frequency of multiauthored technical articles. In the next sentence, a frequency—“usually”—is given, but only for multiauthored clinical trial reports. The test makers give you hard data about the clinical trial reports, and then try to entice you into picking a broader answer involving technical reports.

Answer choice (D): This is a Reverse answer that contains a complex pair of reversed elements when matched against the stimulus. Let us compare the stimulus and the answer choice, using italics to indicate the reversed parts:

The stimulus states, “physics papers reporting results from experiments using *subsystems developed at various laboratories* generally have *authors from each laboratory*.”

Answer choice (D) states, “Physics papers authored by *researchers from multiple laboratories* usually report results from experiments using *subsystems developed at each laboratory*.”

The reversed pair has two notable features:

1. The numbers are reversed—authors from *each* laboratory have become researchers (authors) from *multiple* laboratories, and subsystems from *various* laboratories have become subsystems from *each* laboratory. In a nutshell, the “various” and “each” elements have been reversed in the sentences.
2. The pair also reverses logical position within the argument, as the stimulus states that the experiments generally have authors from each laboratory and the answer choice states that the researchers usually

Answer choice (C) shows how the Shell Game can occur in the stimulus as well as in the answer choices. The stimulus of this problem switches from “technical articles” to “reports of clinical trials.” Answer choice (C) plays on that substitution.

report experiments from each laboratory.

Answer choice (E): As with answer choice (C), we do not know enough about technical articles to support this answer choice.

Stimulus Opinions versus Assertions

Please take a moment to complete the following problem:

5. Some environmentalists question the prudence of exploiting features of the environment, arguing that there are no economic benefits to be gained from forests, mountains, or wetlands that no longer exist. Many environmentalists claim that because nature has intrinsic value it would be wrong to destroy such features of the environment, even if the economic costs of doing so were outweighed by the economic costs of not doing so.

Which one of the following can be logically inferred from the passage?

- (A) It is economically imprudent to exploit features of the environment.
- (B) Some environmentalists appeal to a noneconomic justification in questioning the defensibility of exploiting features of the environment.
- (C) Most environmentalists appeal to economic reasons in questioning the defensibility of exploiting features of the environment.
- (D) Many environmentalists provide only a noneconomic justification in questioning the defensibility of exploiting features of the environment.
- (E) Even if there is no economic reason for protecting the environment, there is a sound noneconomic justification for doing so.

This is a very interesting stimulus because the author repeats the opinions of others and never makes an assertion of his or her own. When a stimulus contains only the opinions of others, then in a Must Be True question you can eliminate any answer choice that makes a flat assertion without reference to those opinions. For example, answer choice (A) makes a factual assertion ("It is...") that cannot be backed up by the author's survey of opinions in the stimulus—the opinions do not let us know the actual facts of the situation. Answer choice (E) can be eliminated for the very same reason.

Answer choices (B), (C), and (D) each address the environmentalists, and thus each is initially a Contender.

Answer choice (B): This is the correct answer. The second sentence references

The "Some environmentalists question..." construction at the start of the stimulus does not lead to the usual counter-conclusion because the stimulus does not contain an argument.

the views of many environmentalists, who claim that “nature has intrinsic value” (for example, beauty). This view is the noneconomic justification cited by the answer choice.

This answer can be a bit tricky because of the convoluted language the test makers use. “Questioning the defensibility of exploiting features of the environment” is a needlessly complex phrase. A more direct manner of writing that phrase would be “attacking the exploitation of the environment.”

To increase the difficulty of this problem, this language was then repeated in answer choices (C) and (D).

Answer choice (C): We only know the opinions of “some” and “many” environmentalists, and these numbers do not provide enough information to discern the views of “most” environmentalists, which is the term used in the answer choice (“many” is not the same as “most”).

Answer choice (D): This answer choice cannot be proven. While we know that many environmentalists claim a noneconomic justification, we do not know that that is the *only* justification they provide.

When you are reading a stimulus, keep a careful watch on the statements the author offers as fact, and those that the author offers as the opinion of others. In a Must Be True question, the difference between the two can sometimes be used to eliminate answer choices.

Final Note

This chapter is only the start of our question analysis. The ideas discussed so far represent a fraction of what you will learn from this book. Future chapters will build on the ideas discussed herein, and present new concepts that will help you attack all types of questions.

On the following page is a review of some of the key points from this chapter. After the review, there is a short problem set to help you test your knowledge of some of the ideas. An answer key follows with explanations. Good luck!

With the analysis of these three questions, examples of each of the incorrect answer categories have been presented.

Must Be True Question Type Review

Must Be True questions require you to select an answer choice that is proven by the information presented in the stimulus. The question format can be reduced to, "What did you read in the stimulus, and what do you know on the basis of that reading?"

You cannot bring in information from outside the stimulus to answer the questions; all of the information necessary to answer the question resides in the stimulus.

All Must Be True answer choices must pass the Fact Test™:

The correct answer to a Must Be True question can always be proven by referring to the facts stated in the stimulus.

If you find yourself having difficulty paraphrasing an answer to a Must Be True question, do not be concerned.

The scope of the stimulus—especially if that scope is broad—often helps eliminate one or more of the answer choices.

You can often predict the occurrence of Must Be True questions because the stimulus of most Must Be True questions does not contain a conclusion.

Correct Answer Types:

Paraphrased answers are answers that restate a portion of the stimulus in different terms. When these answers mirror the stimulus, they are correct.

Combination answers result from combining two or more statements in the stimulus.

Incorrect Answer Types:

Could Be True answers are attractive because they can possibly occur, but they are incorrect because they do not have to be true.

Exaggerated answers take information from the stimulus and then stretch that information to make a broader statement that is not supported by the stimulus.

New Information answers include information not explicitly mentioned in the stimulus. Be careful with these answers: first examine the scope of the stimulus to make sure the "new" information does not fall under the umbrella of a term or concept in the stimulus. Second, examine the

answer to make sure it is not the consequence of combining stimulus elements.

The Shell Game occurs when an idea or concept is raised in the stimulus, and then a very similar idea appears in the answer choice, but the idea is changed just enough to be incorrect while remaining attractive.

The Opposite answer is completely opposite of the facts of the stimulus.

The Reverse answer is attractive because it contains familiar elements from the stimulus, but the reversed statement is incorrect because it rearranges those elements to create a new, unsupported statement.

Must Be True Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 93*

1. Some argue that laws are instituted at least in part to help establish a particular moral fabric in society. But the primary function of law is surely to help order society so that its institutions, organizations, and citizenry can work together harmoniously, regardless of any further moral aims of the law. Indeed, the highest courts have on occasion treated moral beliefs based on conscience or religious faith as grounds for making exceptions in the application of laws.

The statements above, if true, most strongly support which one of the following?

- (A) The manner in which laws are applied sometimes takes into account the beliefs of the people governed by those laws.
- (B) The law has as one of its functions the ordering of society but is devoid of moral aims.
- (C) Actions based on religious belief or on moral conviction tend to receive the protection of the highest courts.
- (D) The way a society is ordered by law should not reflect any moral convictions about the way society ought to be ordered.
- (E) The best way to promote cooperation among a society's institutions, organizations, and citizenry is to institute order in that society by means of law.

2. Newtonian physics dominated science for over two centuries. It found consistently successful application, becoming one of the most highly substantiated and accepted theories in the history of science. Nevertheless, Einstein's theories came to show the fundamental limits of Newtonian physics and to surpass the Newtonian view in the early 1900s, giving rise once again to a physics that has so far enjoyed wide success.

Which one of the following logically follows from the statements above?

- (A) The history of physics is characterized by a pattern of one successful theory subsequently surpassed by another.
- (B) Long-standing success or substantiation of a theory of physics is no guarantee that the theory will continue to be dominant indefinitely.
- (C) Every theory of physics, no matter how successful, is eventually surpassed by one that is more successful.
- (D) Once a theory of physics is accepted, it will remain dominant for centuries.
- (E) If a long-accepted theory of physics is surpassed, it must be surpassed by a theory that is equally successful.

Must Be True Question Problem Set

3. The solidity of bridge piers built on pilings depends largely on how deep the pilings are driven. Prior to 1700, pilings were driven to "refusal," that is, to the point at which they refused to go any deeper. In a 1588 inquiry into the solidity of piers for Venice's Rialto Bridge, it was determined that the bridge's builder, Antonio Da Ponte, had met the contemporary standard for refusal: he had caused the pilings to be driven until additional penetration into the ground was no greater than two inches after twenty-four hammer blows.

Which one of the following can properly be inferred from the passage?

- (A) The Rialto Bridge was built on unsafe pilings.
 - (B) The standard of refusal was not sufficient to ensure the safety of a bridge.
 - (C) Da Ponte's standard of refusal was less strict than that of other bridge builders of his day.
 - (D) After 1588, no bridges were built on pilings that were driven to the point of refusal.
 - (E) It is possible that the pilings of the Rialto Bridge could have been driven deeper even after the standard of refusal had been met.
4. Every moral theory developed in the Western tradition purports to tell us what a good life is. However, most people would judge someone who perfectly embodied the ideals of any one of these theories not to be living a good life—the kind of life they would want for themselves and their children.

The statements above, if true, most strongly support which one of the following?

- (A) Most people desire a life for themselves and their children that is better than a merely good life.
- (B) A person who fits the ideals of one moral theory in the Western tradition would not necessarily fit the ideals of another.
- (C) Most people have a conception of a good life that does not match that of any moral theory in the Western tradition.
- (D) A good life as described by moral theories in the Western tradition cannot be realized.
- (E) It is impossible to develop a theory that accurately describes what a good life is.

5. Mystery stories often feature a brilliant detective and the detective's dull companion. Clues are presented in the story, and the companion wrongly infers an inaccurate solution to the mystery using the same clues that the detective uses to deduce the correct solution. Thus, the author's strategy of including the dull companion gives readers a chance to solve the mystery while also diverting them from the correct solution.

Which one of the following is most strongly supported by the information above?

- (A) Most mystery stories feature a brilliant detective who solves the mystery presented in the story.
 - (B) Mystery readers often solve the mystery in a story simply by spotting the mistakes in the reasoning of the detective's dull companion in that story.
 - (C) Some mystery stories give readers enough clues to infer the correct solution to the mystery.
 - (D) The actions of the brilliant detective in a mystery story rarely divert readers from the actions of the detective's dull companion.
 - (E) The detective's dull companion in a mystery story generally uncovers the misleading clues that divert readers from the mystery's correct solution.
6. Cézanne's art inspired the next generation of artists, twentieth-century modernist creators of abstract art. While most experts rank Cézanne as an early modernist, a small few reject this idea. Françoise Cachin, for example, bluntly states that such an ascription is "overplayed," and says that Cézanne's work is "too often observed from a modern point of view."

Which one of the following statements is most strongly supported by the information above?

- (A) Cézanne's work is highly controversial.
- (B) Cézanne was an early creator of abstract art.
- (C) Cézanne's work helped to develop modernism.
- (D) Modern art owes less to Cézanne than many experts believe.
- (E) Cézanne's work tends to be misinterpreted as modernist.

Must Be True Question Problem Set

7. Light is registered in the retina when photons hit molecules of the pigment rhodopsin and change the molecules' shape. Even when they have not been struck by photons of light, rhodopsin molecules sometimes change shape because of normal molecular motion, thereby introducing error into the visual system. The amount of this molecular motion is directly proportional to the temperature of the retina.

Which one of the following conclusions is most strongly supported by the information above?

- (A) The temperature of an animal's retina depends on the amount of light the retina is absorbing.
- (B) The visual systems of animals whose body temperature matches that of their surroundings are more error-prone in hot surroundings than in cold ones.
- (C) As the temperature of the retina rises, rhodopsin molecules react more slowly to being struck by photons.
- (D) Rhodopsin molecules are more sensitive to photons in animals whose retinas have large surface areas than in animals whose retinas have small surface areas.
- (E) Molecules of rhodopsin are the only pigment molecules that occur naturally in the retina.

8. One of the most vexing problems in historiography is dating an event when the usual sources offer conflicting chronologies of the event. Historians should attempt to minimize the number of competing sources, perhaps by eliminating the less credible ones. Once this is achieved and several sources are left, as often happens, historians may try, though on occasion unsuccessfully, to determine independently of the usual sources which date is more likely to be right.

Which one of the following inferences is most strongly supported by the information above?

- (A) We have no plausible chronology of most of the events for which attempts have been made by historians to determine the right date.
- (B) Some of the events for which there are conflicting chronologies and for which attempts have been made by historians to determine the right date cannot be dated reliably by historians.
- (C) Attaching a reliable date to any event requires determining which of several conflicting chronologies is most likely to be true.
- (D) Determining independently of the usual sources which of several conflicting chronologies is more likely to be right is an ineffective way of dating events.
- (E) The soundest approach to dating an event for which the usual sources give conflicting chronologies is to undermine the credibility of as many of these sources as possible.

Must Be True Problem Set Answer Key

All answer keys in this book indicate the question number, the question type classification, and the correct answer.

Question #1. Must. The correct answer choice is (A)

Unlike many Must Be True question stimuli, this stimulus contains an argument. The conclusion is in the second sentence: “the primary function of law is surely to help order society so that its institutions, organizations, and citizenry can work together harmoniously, regardless of any further moral aims of the law.” The stimulus also begins with the “Some argue that...” construction, and as usual, is followed by a conclusion that argues against the position established in the first sentence (see “A Commonly Used Construction” in Chapter Two if this sounds unfamiliar). The last sentence is a premise that proves to be key for choosing the correct answer.

Answer choice (A): This correct answer is largely a paraphrase of the last sentence.

Answer choice (B): While the author certainly agrees with the first part of the sentence, in the second part the phrase “devoid of moral aims” is too strong to be supported by the information in the stimulus. The last sentence indicates that morality has some effect on the law and invalidates the “devoid” claim.

Answer choice (C): This is an Exaggerated answer. Although the last sentence indicates that religious faith has been grounds for making exceptions in the application of law, the stimulus does not indicate that actions based on religious or moral belief *tend* to receive the protection of the highest courts.

Answer choice (D): The author indicates that the “primary function” of law is to help order society; the author does not indicate that this is the one and only function of law. The answer choice overstates the case by saying that a society ordered by law should *not reflect any* moral convictions about the ordering.

Answer choice (E): No mention is made of the “best way” to promote cooperation, only that the primary function of law is to promote such cooperation.

Question #2. Must. The correct answer choice is (B)

The stimulus tells the story of recent physics theories: Newtonian physics was preeminent for over two centuries, and despite widespread acknowledgment and confirmation it was surpassed by Einsteinian physics in the early 1900s.

Answer choice (A): The two theories cited in the stimulus are not sufficient to form a *pattern*, which is the basis of answer choice (A).

Must Be True Problem Set Answer Key

Answer choice (B): This is the correct answer. As shown by the case of Newtonian physics, success and substantiation is no guarantee of dominance.

Answer choice (C): This is an Exaggerated answer that takes one instance and exaggerates it into a pattern. Although Newtonian physics was surpassed, this does not prove that every theory of physics will eventually be surpassed. The answer goes farther than the facts of the stimulus and fails the Fact Test.

Answer choice (D): Like answer choice (C), this answer goes too far. Although some theories of physics have been dominant for centuries, there is no guarantee that every theory will be dominant for that long.

Answer choice (E): Even though Einsteinian physics has enjoyed wide success in surpassing Newtonian physics, nowhere in the stimulus is there evidence to prove that each theory *must be* surpassed by an equally successful theory.

Question #3. Must. The correct answer choice is (E)

This interesting stimulus contains two definitions of “refusal:” an initial definition that implies refusal is a point at which pilings will go no further, and then a second, contemporary standards definition of refusal that reveals that refusal is a point at which additional penetration into the ground is no greater than two inches after twenty-four hammer blows. The stimulus is a fact set, and thus there is no conclusion present.

Answer choice (A): Although there was an inquiry into the solidity of the piers of the Rialto Bridge, the results of that inquiry are not disclosed. The only other information we are given is that the pilings of the Rialto Bridge met the contemporary standard of refusal, but this is not sufficient to indicate whether the pilings of this particular bridge were safe. Hence, this answer fails the Fact Test and is incorrect.

Answer choice (B): Similar to answer choice (A), we have insufficient information to make this judgment.

Answer choice (C): This answer is somewhat opposite of the information in the stimulus, which states that Da Ponte had met the contemporary standard of refusal.

Answer choice (D): This is another Opposite answer. The stimulus indicates that bridges built prior to 1700 were driven to the point of refusal.

Answer choice (E): This is the correct answer. As stated in the stimulus, “he had caused the pilings to be driven until additional penetration into the ground was no greater than two inches after twenty-four hammer blows.” The statement indicates that additional penetration was possible with a sufficient number of hammer blows.

Must Be True Problem Set Answer Key

Question #4. Must. The correct answer choice is (C)

This is a fact set. Note the strength of the modifiers in this stimulus—"every," "most," and "any." We should be able to use this narrow scope to support a fairly strong statement, but be careful: the test makers know this too and they will supply several answer choices that are worded strongly. Make sure you select an answer that conforms to the facts.

Answer choice (A): The phrase "better than a merely good life" goes beyond the statements in the stimulus.

Answer choice (B): This answer is incorrect because we are not given information about how the moral theories are different, or if they differ at all. The only detail we are told is that the theories all have one thing in common—they tell us what a good life is. Since the answer choice makes a claim based on differences between theories, it cannot be correct.

Answer choice (C): This is the correct answer. At first glance, this answer choice may seem a bit strong in saying the conception would not match that of *any* moral theory. But, as discussed above, we can support this because the stimulus uses very strong language, specifically stating "*most* people would judge someone who perfectly embodied the ideals of *any* one of these theories *not* to be living a good life." (*italics added*).

Answer choice (D): This answer is worded strongly but it quickly fails the Fact Test. Nothing is said to indicate that the life described by one of the moral theories cannot be realized.

Answer choice (E): This answer also has strong language, but it goes too far in saying that it is *impossible* to develop a theory that accurately describes a good life.

Question #5. Must. The correct answer choice is (C)

The last sentence contains a conclusion, and this conclusion is the primary evidence that supports answer choice (C).

Answer choice (A): The word "often" in the first sentence is the key to this answer choice. "Often" means frequently, but frequently is not the same as "most." Had the stimulus said "more often than not," that would mean "most" and this answer choice would be correct.

Answer choice (B): We cannot determine if readers of mystery stories solve the mystery simply by spotting the errors of the dull companion.

Answer choice (C): This is the correct answer. The second sentence indicates that "clues are presented in the story...the detective uses to deduce the correct solution." Combined with the last sentence, which states "the author's strategy...gives readers a chance to solve the mystery," this answer choice is proven by facts.

Must Be True Problem Set Answer Key

Answer choice (D): Look for the facts in the stimulus—do they support this answer? Although the dull companion diverts readers from the correct solution, we do not know if actions of the brilliant detective rarely divert readers from the actions of the dull companion.

Answer choice (E): This is a tricky answer choice if you do not read closely. The stimulus states that the dull companion infers a wrong solution from clues that the brilliant detective ultimately uses to solve the mystery. Answer choice (E) states that the dull companion uncovers misleading clues. This is incorrect; the interpretation of the clues is misleading, not the clues themselves.

Question #6. *Must.* The correct answer choice is (C)

The final three problems in this section are harder than the previous five. This problem is answered correctly by about 45% of test takers and is classified as difficult (the hardest GMAT questions have success rates under 20%. Fortunately, questions this difficult appear infrequently). Students can miss questions for a variety of reasons:

1. The stimulus is difficult to understand.
2. The question stem is difficult to classify (very rare) or confusing.
3. The correct answer is deceptive, causing students to avoid it.
4. One (or more) of the incorrect answers is attractive, drawing students to it.

Given that the stimulus is a simple fact set and that none of the incorrect answers attracted more than 15% of test takers, the difficulty in this problem apparently lies in the correct answer.

Answer choice (A): The controversy in the stimulus is about the categorization of Cézanne as an artist, not about Cézanne's work. Further, even if the answer did correctly reference the categorization controversy, the answer would still be suspect because of the word "highly." The stimulus indicates that only a small few reject the categorization of Cézanne as an early modernist and most experts accept it.

Answer choice (B): The stimulus asserts that Cézanne *inspired* the creators of abstract art, not that Cézanne himself created abstract art.

Answer choice (C): This correct answer is a paraphrase of the first sentence. The deceptiveness of this answer lies in two areas:

1. The substitution of "develop" for "inspire." Some students feel the word "develop" is too strong, but if Cézanne inspired the creators of the next generation of art then he helped develop it.
2. The use of the word "modernism." Some students are thrown off by "modernism" because they expect to see "abstract" instead. The stimulus is careful about saying "twentieth-century modernist creators of abstract art." Notice how the test makers use answer choice (B)—which mentions "abstract"—to subtly prepare you to make this error.

Must Be True Problem Set Answer Key

Answer choice (D): The first sentence indicates that Cézanne inspired the modernist creators. The rest of the stimulus discusses a disagreement about the categorization of Cézanne that is not resolved in favor of either group. Hence, there is no way for us to determine if modern art owes less to Cézanne than many experts believe.

Answer choice (E): The word “tends” is the problem in this answer choice. Logically, “tends” means “most.” So, according to answer choice (E), Cézanne’s work is usually misinterpreted as modernist. The stimulus disagrees with this view: only a “small few” reject the categorization of Cézanne as a modernist whereas the majority accepts it. Further, the disagreement in the stimulus involves art experts, and from their view we would dispute answer choice (E). Answer choice (E) can also be understood as involving all interpretation of Cézanne’s work—whether by art expert or not—and from this perspective the answer is still unsupported since the views of others are not discussed in the stimulus.

Question #7. Must. The correct answer choice is (B)

The stimulus is a fact set. Part of the difficulty with this problem is the scientific subject matter. Many people are intimidated by the mention of rhodopsin, with which they are unfamiliar. As with the flavonoids in problem #1 of the chapter text, you do not need to know what rhodopsin is to complete the problem. The stimulus can be broken into several easily digestible parts:

Premise: Light is registered in the retina when photons hit rhodopsin molecules and the molecules change shape.

Premise: Due to normal molecular motion, rhodopsin molecules sometimes change shape without having been hit by light. This change causes errors in the visual system.

Premise: The amount of molecular motion is directly proportional to the temperature of the retina.

Answer choice (A): The stimulus does not indicate that the temperature of the retina *depends on* the amount of light. It could easily be affected by other factors, such as body temperature. About 15% of test takers fell prey to this answer.

Answer choice (B): This is the correct answer and just over 40% of test takers correctly choose this answer. To prove this answer you must link together several pieces of information. First, the last sentence of the stimulus shows that the amount of rhodopsin molecular motion is directly proportional to the temperature of the retina, and the second sentence of the stimulus shows that this motion causes visual errors, so the higher the retinal temperature, the more errors in the visual system. The answer choice ties body temperature (remember, the retina is a body part) to the temperature of the surroundings and then rightly notes that hot surroundings would cause more visual errors than cold surroundings if body temperature matched those surroundings.

Answer choice (C): This was the most popular incorrect answer, and just under a quarter of test takers fell for this answer. The answer is wrong because we do not know that temperature causes the rhodopsin to *react more slowly*. Higher retinal temperature causes the rhodopsin molecules to change shape, but no mention is made of reaction time. This answer falls under the “New information” category.

Must Be True Problem Set Answer Key

Answer choice (D): Another New Information answer choice. Similar to answer choice (C), this answer fails the Fact Test because no information is given about the surface area of the retina. Answer choices (C) and (D) are great examples of how an answer can contain information unmentioned by the stimulus. These answers are somewhat attractive because there is nothing actively wrong about them and thus they could be true. To avoid them, always keep in mind that your goal is to find the answer that must occur based on the information in the stimulus.

Answer choice (E): While the stimulus focuses on rhodopsin, no indication is given that rhodopsin is the only naturally occurring pigment molecule—there could be others.

Question #8. Must. The correct answer choice is (B)

This is a very challenging problem, and only about a quarter of students answer this problem correctly. The stimulus is a fact set and offers a solution for dating an event when the usual sources offer conflicting chronologies:

1. Minimize the number of competing sources, possibly by eliminating the less credible ones.
2. Independent of the usual sources, determine which date is more likely to be right.

Notice how the test makers throw in the word “historiography” in order to be intimidating. As usual, you do not need to know the meaning of this word (or any unusual word) in order to continue with the problem. The remainder of the sentence makes clear that dating an event is the point of discussion, and you can comfortably connect the “historio” word root to “date an event” and “historians” and confidently move on with a good idea that historiography is connected to history in some way. By definition, historiography is the writing of history.

Answer choice (A): The stimulus discusses dates where there is conflict between sources. In no way does the stimulus support answer choice (A).

Answer choice (B): This is the correct answer. As stated in the last sentence, historians are on occasion unsuccessful in determining independently the date of an event. If the usual sources offered are in conflict about the date of a particular event and an analysis independent of the usual sources fails to confirm a date, then a date cannot be reliably determined for the event.

Answer choice (C): About one-third of all test takers choose this answer. The stimulus speaks specifically of dating an event *when the usual sources offer conflicting chronologies*. The stimulus does not discuss dating an event when there is no conflict of chronologies, and most likely many dates could be set with certainty in the absence of any conflict. With this in mind, the language of the answer choice becomes problematic because “attaching a reliable date to *any* event” would not “*require* determining which of several conflicting chronologies is most likely to be true.”

Must Be True Problem Set Answer Key

Answer choice (D): The language of the answer choice is too strong in saying that an independent determination is an *ineffective* way of dating events. There is simply not enough information about what constitutes a “determination independent of the usual sources” to say it is ineffective.

Answer choice (E): This is another tricky answer, and just under a quarter of test takers incorrectly select this answer. The answer claims that the soundest approach to dating an event is to *undermine the credibility* of as many of the competing sources as possible. First, the stimulus suggests that the historian should, perhaps, eliminate the less credible ones. No mention is made of eliminating as many as possible, and the stimulus indicates that several remaining sources are to be expected. Second, that same section discusses eliminating less credible sources, not undermining the credibility of those sources.

C

CHAPTER FIVE: MAIN POINT QUESTIONS

Main Point Questions

Important Note: Main Point questions appear infrequently in GMAT Critical Reasoning. However, we have included this question type for two important reasons:

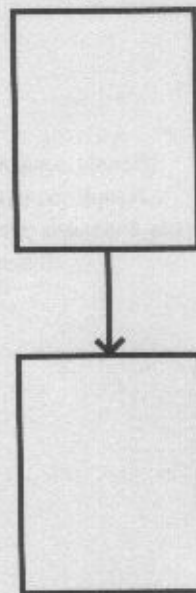
1. The process of identifying the main point is invaluable when you are attempting to perform other tasks with an argument, such as Weaken, Strengthen, etc.
2. Main Point questions appear frequently in GMAT Reading Comprehension, and therefore a discussion of this question type will benefit you when you face Reading Comprehension passages.

Main Point questions may be the question type most familiar to test takers. Many of the standardized tests you have already encountered, such as the SAT, contain questions that ask you to ascertain the Main Point. Even in daily conversation you will hear, "What's your point?" Main Point questions, as you might suspect from the name, ask you to summarize the author's point of view.

From a classification standpoint, Main Point questions are a subcategory of Must Be True questions and fall into the First Family type. As with all First Family questions, the answer you select must follow from the information in the stimulus. But be careful: even if an answer choice must be true according to the stimulus, if it fails to capture the main point it cannot be correct. This is the central truth of Main Point questions: like all Must Be True question variants the correct answer must pass the Fact Test, but with the additional criterion that the correct answer choice must capture the author's point.

Because every Main Point question stimulus contains an argument, if you apply the methods discussed in Chapters Two and Three you should already know the answer to a Main Point question by the time you read the question stem. Primary Objective #2 states that you should identify the conclusion of the argument, and the correct answer choice to these problems will be a rephrasing of the main conclusion of the argument. So, by simply taking the steps you would take to solve any question, you already have the answer to a Main Point question at your fingertips. Be careful, though: many Main Point problems

First Family
Model:



feature a structure that places the conclusion either at the beginning or in the middle of the stimulus. Most students have an unstated expectation that the conclusion will appear in the last sentence, and the test makers are able to prey upon this expectation by creating wrong answers that paraphrase the last sentence of the stimulus. To avoid this trap, simply avoid assuming that the last sentence is the conclusion.

The Main Point question stem format is remarkably consistent, with the primary feature being a request for you to identify the conclusion or point of the argument, as in the following examples:

“Which one of the following most accurately expresses the main conclusion of the argument?”

“Which one of the following most accurately expresses the conclusion of the journalist’s argument?”

“Which one of the following most accurately restates the main point of the passage?”

“The main point of the argument is that”

Two Incorrect Answer Types

Two types of answers typically appear in Main Point questions. Both are incorrect:

1. Answers that are true but do not encapsulate the author’s point.
2. Answers that repeat premises of the argument.

Each answer type is attractive because they are true based on what you have read. However, neither summarizes the author’s main point and therefore both are incorrect.

Because you have already learned the skills necessary to complete these questions, we will use the following two questions for discussion purposes. Please take a moment to complete the following problem:

1. Journalist: A free marketplace of ideas ensures that all ideas get a fair hearing. Even ideas tainted with prejudice and malice can prompt beneficial outcomes. In most countries, however, the government is responsible for over half the information released to the public through all media. For this reason, the power of governments over information needs to be curtailed. Everyone grants that governments should not suppress free expression, yet governments continue to construct near monopolies on the publication and dissemination of enormous amounts of information.

Which one of the following most accurately expresses the conclusion of the journalist's argument?

- (A) The freedom of the marketplace of ideas is in jeopardy.
- (B) Preserving a free marketplace of ideas is important.
- (C) The control that governments have over information needs to be reduced.
- (D) Ideas that have malicious content or stem from questionable sources can be valuable.
- (E) Governments have near monopolies on the dissemination of many kinds of information.

The conclusion to this argument is the fourth sentence, which begins with the conclusion indicator "For this reason..." By applying the Primary Objectives you should have identified this conclusion while reading, and then, upon classifying the question stem you should have looked for a paraphrase of this sentence. Answer choice (C) fits the bill, and is the correct answer.

Always identify the conclusion of any argument you read!

Answer choice (A): The author would agree with this statement but this is not the Main Point of the argument; rather, it is closer to a premise that might support the conclusion.

Incidentally, the author's general agreement with this answer choice is signalled by the use of "however" in the third sentence. In the stimulus, the author begins by mentioning that a free marketplace of ideas, including dangerous ideas, ensures a fair hearing of ideas. In the third sentence, the author then says, "however, the government is responsible for over half the information released to the public," indicating the author feels the government is a threat to this free marketplace.

Paraphrased answers are always correct in Must Be True questions. Answers that paraphrase the conclusion are correct in Main Point questions.

Answer choice (B): The author would also agree with this statement, but again this is not the Main Point of the argument. As discussed in the analysis of answer choice (A), the author believes that the freedom of the marketplace of ideas is at risk, and in stating that we should curtail the government's power over information, the author assumes that preserving a free marketplace of ideas is important. Thus this answer choice would be better described as an unstated premise that supports the conclusion.

Answer choice (C): This is the correct answer. Remember, any answer that is a paraphrase of the conclusion of the argument will be the correct answer to a Main Point question.

Answer choice (D): The stimulus specifically notes that malicious or prejudicial ideas can "prompt beneficial outcomes." The outcome of an idea is different from stating the ideas themselves "can be valuable."

Answer choice (E): The stimulus states that "governments continue to construct near monopolies on the publication and dissemination of enormous amounts of information." This phrasing is not the same as answer choice (E), which asserts that the government *already* has a monopoly on the dissemination of *many* kinds of information.

The lesson learned from this particular problem is that you must isolate the conclusion and then look for a paraphrase of that conclusion.

Unlike the question above, many Main Point question stimuli avoid using traditional conclusion indicators and this lack of argument indicator "guideposts" makes your task more challenging. Remember, if you are struggling to identify the conclusion in an argument, you can always use the Conclusion Identification Method discussed in Chapter Two:

If an argument contains two conclusions you will be forced to identify which one is the main conclusion and which one is the subsidiary conclusion.

Take the statements under consideration for the conclusion and place them in an arrangement that forces one to be the conclusion and the other(s) to be the premise(s). Use premise and conclusion indicators to achieve this end. Once the pieces are arranged, determine if the arrangement makes logical sense. If so, you have made the correct identification. If not, reverse the arrangement and examine the relationship again. Continue until you find an arrangement that is logical.

If you cannot identify the conclusion in a Main Point question, you must go back and apply this methodology. Otherwise, without the conclusion how can you answer the question?

Please take a moment to complete the following problem:

2. I agree that Hogan's actions resulted in grievous injury to Winters. And I do not deny that Hogan fully realized the nature of his actions and the effects that they would have. Indeed, I would not disagree if you pointed out that intentionally causing such effects is reprehensible, other things being equal. But in asking you to concur with me that Hogan's actions not be wholly condemned I emphasize again that Hogan mistakenly believed Winters to be the robber who had been terrorizing west-side apartment buildings for the past several months.

Which one of the following most accurately expresses the conclusion of the argument?

- (A) Hogan should not be considered responsible for the injuries sustained by Winters.
- (B) The robber who had been terrorizing west-side apartment buildings should be considered to be as responsible for Winters's injuries as Hogan.
- (C) The actions of Hogan that seriously injured Winters are not completely blameworthy.
- (D) Hogan thought that Winters was the person who had been terrorizing west-side apartment buildings for the last few months.
- (E) The actions of Hogan that seriously injured Winters were reprehensible, other things being equal.

The conclusion of this argument is difficult to identify because the author does not use a traditional conclusion indicator. The first three sentences are admissions by the author regarding the nature of Hogan's actions. The fourth sentence contains the conclusion and a premise, and the conclusion is that "Hogan's actions should not be wholly condemned."

If you struggled to identify the conclusion, consider how you might have applied the Conclusion Identification Methodology to the pieces of the argument. For example, consider the two parts of the last sentence. If you thought one of them might be the conclusion, place one as the conclusion and the other as a premise, as follows:

"Because I ask that Hogan's actions not be wholly condemned, therefore I emphasize again that Hogan mistakenly believed Winters to be the robber who had been terrorizing west-side apartment buildings for the past several months."

Does that configuration sound right? No. Try again by reversing the premise and conclusion pieces:

Remember: Main Point questions are Must Be True questions with an additional criterion—you must also identify the author's point.

“Because Hogan mistakenly believed Winters to be the robber who had been terrorizing west-side apartment buildings for the past several months, therefore I ask you to concur with me that Hogan’s actions not be wholly condemned.”

The relationship now sounds much more logical.

Answer choice (A): The author admits that Hogan fully realized his actions and the author asks that “Hogan’s actions not be wholly condemned.” Both of these statements are counter to the idea that Hogan should not be considered responsible for Winter’s injuries.

Answer choice (B): The only reference to the robber is that Hogan mistakenly believed that Winters was the robber. Thus, there is no evidence in the stimulus to support this answer.

Answer choice (C): This correct answer is a paraphrase of the conclusion of the argument.

Answer choice (D): According to the information in the stimulus, this answer must be true. Regardless, the answer is still incorrect because it fails to summarize the author’s main point. This type of answer—one that is true but misses the main point—is frequently featured as an incorrect answer in Main Point questions.

Answer choice (E): Like answer choice (D), this statement is true according to the stimulus. But, it is incorrect because it does not capture the main point.

Final Chapter Note

There are three elements remaining in this chapter: a review of Main Point questions; a brief Must Be True and Main Point Question Stem Mini-Drill; and two more Main Point questions with complete explanations. Please complete each element in the order presented and read the explanations carefully.

Main Point Question Type Review

From a classification standpoint, Main Point questions are a subcategory of Must Be True questions and thus fall into the First Family type.

The Main Point is the same as the conclusion of the argument. By applying the Primary Objectives you should already have the answer to a Main Point question by the time you read the question stem.

The correct answer choice must not only be true according to the stimulus, it must also summarize the author’s point. Avoid answers that are true but miss the point of the author’s argument.

Must Be True and Main Point Question Stem Mini-Drill

Each of the following items contains a question stem from a recent LSAT question. In the space provided, categorize each stem as either a Must Be True or Main Point question, and notate any Except (X) identifier you see. *Answers on Page 108*

1. Question Stem: "Which one of the following statements is most strongly supported by the information above?"

Question Type: _____

2. Question Stem: "The information above provides the LEAST support for which one of the following?"

Question Type: _____

3. Question Stem: "The educators' reasoning provides grounds for accepting which one of the following statements?"

Question Type: _____

4. Question Stem: "Which one of the following most accurately expresses the argument's conclusion?"

Question Type: _____

5. Question Stem: "Which one of the following can be inferred from the passage above?"

Question Type: _____

Must Be True and Main Point Question Stem Mini-Drill Answer Key

1. Question Type: Must Be True

In this case, the “most strongly supported” is used with the intent of proving one of the answers correct. Hence, this is a Must Be True question.

2. Question Type: Must Be True X

The presence of “LEAST” makes this an Except question and the presence of the phrase “support for which one of the following” adds the Must Be True element. The four incorrect answer choices Must Be True; the correct answer choice is not necessarily true.

3. Question Type: Must Be True

“Accepting which one of the following statements” is identical to asking you to find the answer that is proven by the information in the stimulus. Hence, this is a Must Be True question.

4. Question Type: Main Point

In asking for the argument’s conclusion, the stem asks you to identify the Main Point of the argument.

5. Question Type: Must Be True

The word “inferred” means must be true. Hence, this is a Must Be True question.

Main Point Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 110*

1. Last month OCF, Inc., announced what it described as a unique new product: an adjustable computer workstation. Three days later ErgoTech unveiled an almost identical product. The two companies claim that the similarities are coincidental and occurred because the designers independently reached the same solution to the same problem. The similarities are too fundamental to be mere coincidence, however. The two products not only look alike, but they also work alike. Both are oddly shaped with identically placed control panels with the same types of controls. Both allow the same types of adjustments and the same types of optional enhancements.

The main point of the argument is that

- (A) the two products have many characteristics in common
- (B) ErgoTech must have copied the design of its new product from OCF's design
- (C) the similarities between the two products are not coincidental
- (D) product designers sometimes reach the same solution to a given problem without consulting each other
- (E) new products that at first appear to be unique are sometimes simply variations of other products

2. Prediction, the hallmark of natural sciences, appears to have been possible by reducing phenomena to mathematical expressions. Some social scientists also want the power to predict accurately and assume they ought to perform the same reduction. But this would be a mistake; it would neglect data that are not easily mathematized and thereby would only distort the social phenomena.

Which one of the following most accurately expresses the main conclusion of the argument?

- (A) The social sciences do not have as much predictive power as the natural sciences.
- (B) Mathematics plays a more important role in the natural sciences than it does in the social sciences.
- (C) There is a need in the social sciences to improve the ability to predict.
- (D) Phenomena in the social sciences should not be reduced to mathematical formulas.
- (E) Prediction is responsible for the success of the natural sciences.

Main Point Problem Set Answer Key

Question #1. MP. The correct answer choice is (C)

Like the majority of Main Point question stimuli, the argument does not contain a traditional conclusion indicator. Thus, you must look at the pieces of the argument in order to determine the point the author is making. In this case, the conclusion is “The similarities are too fundamental to be mere coincidence.” Use the Conclusion Identification Method to help establish that point if you are unsure. The argument uses the fact that the two workstations are similar and were released in the same timespan to assume that the similarity is not caused by coincidence.

Answer choice (A): This is a repeat of a premise of the argument, not the main point. As mentioned in the discussion, in Main Point questions you should expect to see incorrect answers that repeat premises from the argument.

Answer choice (B): The statement does not pass the Fact Test. The scenario could be reversed: OCF could have copied Ergotech. Regardless, this is not the main point.

Answer choice (C): This correct answer is a paraphrase of the conclusion.

Answer choice (D): This would undermine the argument and thus it cannot be the main point.

Answer choice (E): Although the author would likely agree with this statement, this does not capture the main point, which addresses the two named products.

Question #2. MP. The correct answer choice is (D)

Like the previous problem, the conclusion is in the middle of the argument and is not prefaced by a conclusion indicator. Get used to seeing this format on Main Point questions! The author states that prediction has been made possible by reducing phenomena to mathematical expressions and that some social scientists want to have this same power. The author argues that it would be a mistake to allow social scientists to have this ability. The conclusion, therefore, is “But this would be a mistake.”

Answer choice (A): The author says, “some social scientists also want the power to predict accurately,” so the author would likely agree with this statement. Regardless, this is not the main point of the argument. Again, be careful with answers that are true according to the author—do they also address the main point?

Answer choice (B): The author might very well agree with this statement, although there is not enough information to assert that this statement is true based on the stimulus (the words “more important” are a bit strong). Regardless, this answer choice does not address the main point of the argument and is therefore wrong.

Answer choice (C): While the social scientists may believe this is true, the author’s point is a different one—that social scientists ought not perform a mathematical reduction. And, because the author believes that prediction is apparently made possible by reducing phenomena to mathematical expressions, the author would likely disagree with this statement.

Answer choice (D): This is the correct answer. The conclusion states that it would be a mistake for social scientists to have the ability to reduce phenomena to mathematical expressions. Answer choice (D) is a paraphrase of that idea.

Answer choice (E): This point is not addressed in the stimulus.

C

HAPTER SIX: WEAKEN QUESTIONS

Weaken Questions

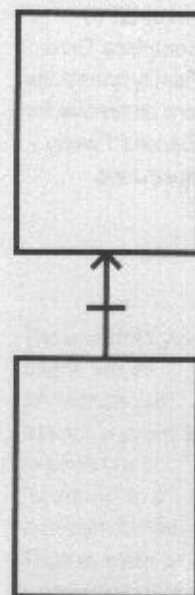
Weaken questions require you to select the answer choice that undermines the author's argument as decisively as possible. Overall, Weaken questions are the most frequently appearing Critical Reasoning question type on the GMAT.

Because Weaken questions are in the Third Family, these questions require a different approach than the Must Be True and Main Point questions we have covered so far. In addition to the Primary Objectives, keep the following rules in mind when approaching Weaken questions:

1. The stimulus will contain an argument. Because you are asked to weaken the author's reasoning, and reasoning requires a conclusion, an argument will always be present. In order to maximize your chances of success you must identify, isolate, and assess the premises and the conclusion of the argument. Only by understanding the structure of the argument can you gain the perspective necessary to attack the author's position.
2. Focus on the conclusion. Almost all correct Weaken answer choices impact the conclusion. The more you know about the specifics of the conclusion, the better armed you will be to differentiate between correct and incorrect answers.
3. The information in the stimulus is suspect. There are often reasoning errors present, and you must read the argument very carefully.
4. Weaken questions often yield strong prephrases. Be sure to actively consider the range of possible answers before proceeding to the answer choices.
5. The answer choices are accepted as given, even if they include "new" information. Unlike Must Be True questions, Weaken answer choices can bring into consideration information outside of or tangential to the stimulus. Just because a fact or idea is not mentioned in the stimulus is *not* grounds for dismissing an answer choice. Your task is to determine which answer choice best attacks the argument in the stimulus.

By following the Primary Objectives and focusing on the points above, you will maximize your chances of success on Weaken questions.

Third Family
Information
Model:



Remember, most Weaken question stems tell you to accept the answer choices as true.

Weaken question stems typically contain the following two features:

1. The stem uses the word “weaken” or a synonym. Following are some examples of words or phrases used to indicate that your task is to weaken the argument:

We discuss the Third Family before the Second Family because some of the skills required to complete Third Family questions are essential for Second Family questions.

weaken
attack
undermine
refute
argue against
call into question
cast doubt
challenge
damage
counter

2. The stem indicates that you should accept the answer choices as true, usually with the following phrase:

“Which of the following, if true, ...”

Here are several Weaken question stem examples:

“Which of the following, if true, most seriously weakens the argument above?”

“Which of the following, if true, casts the most doubt on the conclusion drawn above?”

“Which of the following, if true, most calls into question the claim above?”

“Which of the following, if true, is most damaging to the conclusion above?”

“Which of the following, if known, is evidence that contradicts the hypothesis above?”

“Which of the following, if discovered, would be evidence against the speculation above?”

How to Weaken an Argument

The key to weakening an GMAT argument is to attack the conclusion. But, keep in mind that to attack is not the same as to destroy. Although an answer that destroys the conclusion would be correct, this rarely occurs because of the minimal space allotted to answer choices. Instead, you are more likely to encounter an answer that hurts the argument but does not ultimately destroy the author's position. When evaluating an answer, ask yourself, "Would this answer choice make the author reconsider his or her position or force the author to respond?" If so, you have the correct answer.

You do not need to find an answer that destroys the author's position. Instead, simply find an answer that hurts the argument.

Because arguments are made up of premises and conclusions, you can safely assume that these are the parts you must attack in order to weaken an argument. Let us discuss each part, and the likelihood that each would be attacked by an answer choice.

1. The Premises

One of the classic ways to attack an argument is to attack the premises on which the conclusion rests. Regrettably, this form of attack is rarely used on the GMAT because when a premise is attacked, the answer choice is easy to spot. Literally, the answer will contradict one of the premises, and most students are capable of reading an argument and then identifying an answer that simply negates a premise.

In practice, almost all correct GMAT Weaken question answers leave the premises untouched.

The one time you might see an answer choice attack a premise is when that "premise" is a sub-conclusion. That is, when a conclusion of one premise is used as a premise to support another conclusion.

2. The Conclusion

The conclusion is the part of the argument that is most likely to be attacked, but the correct answer choice will not simply contradict the conclusion. Instead, the correct answer will undermine the conclusion by showing that the conclusion fails to account for some element or possibility. In this sense, the correct answer often shows that the conclusion does not necessarily follow from the premises even if the premises are true. Consider the following example:

All my neighbors own blue cars. Therefore I own a blue car.

Even though the statement that the neighbors have blue cars is entirely reasonable, the weakness in the argument is that this fact has no impact on the color of the car I own. In this overly simplified problem, the correct weakening answer would be something along the lines of, "The cars of one's neighbors have no determinative effect on the car any individual owns." Would that conclusively

disprove that I own a blue car? No. Does it show that perhaps I do not own a blue car? Yes. Does it disprove that my neighbors own blue cars? No.

Assumptions will be discussed in more detail in Chapter Eight.

Answers that weaken the argument's conclusion will attack assumptions made by the author. In the example above, the author assumes that the neighbors' ownership of blue cars has an impact on the color of the car that he owns. If this assumption were shown to be questionable, the argument would be undermined.

The stimuli for weaken questions contain errors of assumption. This makes sense, because the easiest argument to weaken is one that already has a flaw. Typically, the author will fail to consider other possibilities or leave out a key piece of information. In this sense the author assumes that these elements do not exist when he or she makes the conclusion, and if you see a gap or hole in the argument immediately consider that the correct answer might attack this hole.

As you consider possible answers, always look for the one that attacks the way the author arrived at the conclusion. Do not worry about the premises and instead focus on the effect the answer has on the conclusion.

Personalizing helps you see the argument from a very involved perspective, and that helps you assess the strength of each answer.

So, we know that we must first focus on the conclusion and how the author arrived at the conclusion. The second key to weakening arguments is to personalize the argument. Most students perform considerably better when they see the argument from their perspective as opposed to trying to understand the issues abstractly. When analyzing the author's argument, imagine how you would respond if you were talking directly to the author. Would you use answer choice (A) or would you prefer answer choice (B)? Students who personalize the argument often properly dismiss answer choices that they would have otherwise wasted time considering.

Common Weakening Scenarios

Although there are many classical logical fallacies, the most common of which we will discuss in the Flaw in the Reasoning section, several scenarios that occur in GMAT Weaken question stimuli are easy to recognize and attack:

1. **Incomplete Information.** The author fails to consider all of the possibilities, or relies upon evidence that is incomplete. This flaw can be attacked by bringing up new possibilities or information.
2. **Improper Comparison.** The author attempts to compare two or more items that are essentially different.

3. **Qualified Conclusion.** The author qualifies or limits the conclusion in such a way as to leave the argument open to attack.

While these three scenarios are not the only ways an argument can be weak, they encompass a large proportion of the errors that appear in GMAT stimuli.

Three Incorrect Answer Traps

There are certain incorrect answer choices that appear frequently in Weaken questions:

1. **Opposite Answers.** As discussed in the Must Be True question chapter, these answers do the exact opposite of what is needed. In this case, they strengthen the argument as opposed to weakening it. Although you might think answers of this type are easy to avoid, they can be very tricky. To analogize, have you ever gotten on a freeway thinking you were going south when in fact you later discovered you were going north? It is easy to make a mistake when you head in the exact opposite direction. In the same way, Opposite answers lure the test taker by presenting information that relates perfectly to the argument, but just in the wrong manner.
2. **Shell Game Answers.** Like Opposite answers, the Shell Game is the same as in the Must Be True discussion. Remember, a Shell Game occurs when an idea or concept is raised in the stimulus and then a very similar idea appears in the answer choice, but the idea is changed just enough to be incorrect but still attractive. In Weaken questions, the Shell Game is usually used to attack a conclusion that is similar to, but slightly different from, the one presented in the stimulus. Later in this chapter you will see some excellent examples of this answer type.
3. **Out of Scope Answers.** These answers simply miss the point of the argument and raise issues that are either not related to the argument or tangential to the argument.

While these three answer types are not the only ways an answer choice can be attractively incorrect, they appear frequently enough that you should be familiar with each form.

Some of the wrong answer types from the Must Be True chapter do not apply to Weaken questions. For example, the New Information answer is usually wrong in a Must Be True question, but not in a Weaken question because new information is acceptable in the answer choices.

Weaken Questions Analyzed

In the following questions we will discuss the form of the stimulus and answer choices against the background of our discussion so far. Please take a moment to complete the following problem:

1. Carl is clearly an incompetent detective. He has solved a smaller percentage of the cases assigned to him in the last 3 years—only 1 out of 25—than any other detective on the police force.

Which one of the following, if true, most seriously weakens the argument above?

- (A) Because the police chief regards Carl as the most capable detective, she assigns him only the most difficult cases, ones that others have failed to solve.
- (B) Before he became a detective, Carl was a neighborhood police officer and was highly respected by the residents of the neighborhood he patrolled.
- (C) Detectives on the police force on which Carl serves are provided with extensive resources, including the use of a large computer database, to help them solve crimes.
- (D) Carl was previously a detective in a police department in another city, and in the 4 years he spent there, he solved only 1 out of 30 crimes.
- (E) Many of the officers in the police department in which Carl serves were hired or promoted within the last 5 years.

This would be classified as an easy question, but as a starting point for our discussion that is helpful. The structure of the argument is simple, and it is easy to see why the premise does not undeniably prove the conclusion. The answers contain several predictable forms, and this is the type of question you should quickly destroy. You do not need to spend a great deal of time trying to find a specific prephrased answer because there are so many possibilities, and the answers can be eliminated without a great deal of time spent considering which are Losers and which are Contenders.

The stimulus uses a premise about success rate to form a conclusion about Carl's competency as a detective. Ask yourself—does the premise prove the conclusion? No, because there are many factors that could have affected Carl's performance. In this sense, the stimulus has incomplete information, and we should try to discover a relevant piece of information in one of the answer choices that will shed more light on why Carl's success rate is so low. Use this knowledge to make a general prephrase that indicates you are looking for a piece of information that shows Carl's success rate is not as low as it seems or that other factors limited Carl's performance.

Answer choice (A): This is the correct answer. We discover that Carl receives the hardest cases, and one would expect that the hardest cases would yield a lower success rate. Notice that this answer does not attack the premises. Even though they are still true, the conclusion is undermined by the new evidence. This is typical of most Weaken question answers—the premises are not addressed and the focus is on the conclusion.

Answer choice (B): This answer is irrelevant. It tries to use the opinion of others about Carl's performance in one capacity to refute facts about his performance in another capacity. Personalize the answer—is this the answer you would offer to weaken the argument against Carl if he were your friend?

Answer choice (C): This is an Opposite answer that strengthens the claim that Carl is incompetent by showing that Carl was not deprived of certain resources for solving cases.

Answer choice (D): This is another Opposite answer that strengthens the claim that Carl is incompetent. This time, the answer shows that Carl has a previous record of poor performance.

Answer choice (E): This answer goes beyond the scope of the argument by discussing the promotions of other officers. These promotions do not impact Carl's job and no information is given about Carl's promotions. If you are thinking that perhaps Carl's poor performance is a result of dissatisfaction over the promotions of others, then you are assuming too much.

Prephrasing is often easier with Weaken questions than with some other question types. Simply put, many people are good at attacking a position and prephrasing puts that skill to use.

Now we will move to a somewhat harder question. Please take a moment to complete the following problem:

2. Beverage company representative: The plastic rings that hold six-packs of beverage cans together pose a threat to wild animals, which often become entangled in the discarded rings and suffocate as a result. Following our lead, all beverage companies will soon use only those rings consisting of a new plastic that disintegrates after only three days' exposure to sunlight. Once we all complete the switchover from the old to the new plastic rings, therefore, the threat of suffocation that plastic rings pose to wild animals will be eliminated.

Which one of the following, if true, most seriously weakens the representative's argument?

- (A) The switchover to the new plastic rings will take at least two more years to complete.
- (B) After the beverage companies have switched over to the new plastic rings, a substantial number of the old plastic rings will persist in most aquatic and woodland environments.
- (C) The new plastic rings are slightly less expensive than the old rings.
- (D) The new plastic rings rarely disintegrate during shipping of beverage six-packs because most trucks that transport canned beverages protect their cargo from sunlight.
- (E) The new plastic rings disintegrate into substances that are harmful to aquatic animals when ingested in substantial quantities by them.

In two-speaker stimuli where you are asked to weaken the argument of one of the speakers, the test makers often use misdirection and place an answer choice that weakens the argument of the other speaker.

The conclusion of this argument is the final sentence, which contains the conclusion indicator "therefore," and the conclusion contains a qualification that the threat of suffocation will be eliminated *after* the switchover is complete. The premises supporting this conclusion are that the new plastic rings will be used by all companies and that the rings disintegrate after three days' exposure to sunlight. Personalize this argument and ask yourself—are there any holes in this argument? Yes, there are several. The most obvious is, "What if an animal becomes entangled in the new rings before they can disintegrate?" In this question, however, that avenue of attack is not used (this was a two-question stimulus and that idea was used in the other question) but there is no way to know this prior to attempting the question.

Answer choice (A): This answer does not hurt the argument because the author qualified the conclusion to account for the date of the switchover, thereby inoculating against this avenue of attack. From a personalizing standpoint,

Imagine what would happen if you raised this issue to the beverage company representative—he or she would simply say, “Yes, that may be the case, but I noted in my conclusion that the program would be effective *once the switchover is complete*.” This is an attractive answer because it raises a point that would be a difficult public relations issue to address. Regardless, this does not hurt the argument given by the beverage company representative, and that is the task at hand.

Answer choice (B): This is the correct answer. Most people select answer choice (E), but as you will see, (E) is incorrect. This answer undermines the representative’s conclusion by showing that even after the switchover is complete, the threat to animals from plastic rings will persist. Note the carefully worded nature of the conclusion—the representative does not say the threat from *new* plastic rings will be eliminated, but rather the threat from plastic rings, which includes both old and new rings.

Answer choice (C): This out-of-scope answer addresses an issue that is irrelevant to the representative’s argument.

Answer choice (D): While this is nice information from a customer service standpoint (you do not want your six-pack of beer falling apart as you walk out of the store), this answer does not affect the conclusion because it does not address the threat of suffocation to animals.

Answer choice (E): This is the most commonly chosen answer, and it is a perfect example of a Shell Game. In this case, the answer preys upon test takers who fail to heed Primary Objective #4: “Read closely and know precisely what the author said. Do not generalize!” Many test takers read the conclusion and think, “So when they start using these new rings, it will make things better for the animals.” When these test takers get to answer choice (E), the answer looks extremely attractive because it indicates that the implementation of the new rings will also have a harmful effect. With this thinking in mind, many test takers select answer choice (E) thinking it undermines the conclusion and they are certain they have nailed the question. However, the conclusion is specifically about suffocation, and answer choice (E) does not address suffocation. Instead, answer choice (E) is a shell game that attacks a conclusion that is similar to but different from the actual conclusion. Remember, one of the rules for weakening arguments is to focus on the conclusion, and knowing the details of the conclusion is part of that focus.

Finally, the placement of answer choice (E) is no accident. Most students do not immediately identify answer choice (B) as the correct answer, and even those that keep it as a Contender often feel it could be stronger. Then, just when things are starting to look bleak, answer choice (E) pops up sounding fairly reasonable. Most people breathe a sigh of relief and select the answer without carefully examining the contents. Never choose answer choice (E) just because the first four answers are not overly attractive! Always make a thorough

Answer choice (E) is a great place for the test makers to place an attractive wrong answer because (E) is the last answer that a student will read, and the contents of (E) “reverberate” in the test taker’s mind and begin to sound reasonable.

In that same vein, answer choice (A) is a great place to put the correct answer if the stimulus is exceedingly difficult to understand or if the question stem is extremely unusual. Why? Because most test takers use the first answer choice in a difficult problem to get a handle on what they are reading and the type of answers they will see. If a problem is tough, it can be difficult to immediately identify answer choice (A) as correct. Then, by the time they have read all five answers, they are prone to have forgotten the details of the first answer choice.

analysis of every answer choice and remember that the test makers know that people get nervous if none of the first four answer choices jump out at them. Do not let the test makers draw you into a trap!

Final Note

We will continue our discussion of Weaken questions in the next chapter, which addresses Cause and Effect Reasoning. We will also continue to discuss argumentation in more detail as we progress through the Second Family of questions and into Method of Reasoning and Parallel Reasoning.

The following page is a review of key points from this chapter. After the review, there is a short problem set to help test your knowledge of these ideas. The problem set is followed by an answer key with explanations. Good luck!

Weaken Question Type Review

Weaken questions require you to select an answer choice that undermines the author's argument as decisively as possible. Keep these fundamental rules in mind when you approach Weaken questions:

1. The stimulus will contain an argument.
2. Focus on the conclusion.
3. The information in the stimulus is suspect. There are often reasoning errors present, and you must read the argument very carefully.
4. Weaken questions often yield strong prephrases.
5. The answer choices are accepted as given, even if they include "new" information.

The conclusion is the part of the argument that is most likely to be attacked, but the correct answer choice will not simply contradict the conclusion. Instead, the correct answer will undermine the conclusion by showing that the conclusion fails to account for some element or possibility. In this sense, the correct answer often shows that the conclusion does not necessarily follow from the premises even if the premises are true.

Several scenarios that can occur in GMAT Weaken question stimuli are easy to recognize and attack:

1. Incomplete Information.
2. Improper Comparison.
3. Qualified Conclusion.

There are certain incorrect answer choices that appear frequently in Weaken questions:

1. Opposite Answers.
2. Shell Game Answers.
3. Out of Scope Answers.

Weaken Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 125*

1. Human beings have cognitive faculties that are superior to those of other animals, and once humans become aware of these, they cannot be made happy by anything that does not involve gratification of these faculties.

Which one of the following statements, if true, most calls into question the view above?

- (A) Certain animals—dolphins and chimpanzees, for example—appear to be capable of rational communication.
- (B) Many people familiar both with intellectual stimulation and with physical pleasures enjoy the latter more.
- (C) Someone who never experienced classical music as a child will usually prefer popular music as an adult.
- (D) Many people who are serious athletes consider themselves to be happy.
- (E) Many people who are serious athletes love gourmet food.

2. Loggerhead turtles live and breed in distinct groups, of which some are in the Pacific Ocean and some are in the Atlantic. New evidence suggests that juvenile Pacific loggerheads that feed near the Baja peninsula hatch in Japanese waters 10,000 kilometers away. Ninety-five percent of the DNA samples taken from the Baja turtles match those taken from turtles at the Japanese nesting sites.

Which one of the following, if true, most seriously weakens the reasoning above?

- (A) Nesting sites of loggerhead turtles have been found off the Pacific coast of North America several thousand kilometers north of the Baja peninsula.
- (B) The distance between nesting sites and feeding sites of Atlantic loggerhead turtles is less than 5,000 kilometers.
- (C) Loggerhead hatchlings in Japanese waters have been declining in number for the last decade while the number of nesting sites near the Baja peninsula has remained constant.
- (D) Ninety-five percent of the DNA samples taken from the Baja turtles match those taken from Atlantic loggerhead turtles.
- (E) Commercial aquariums have been successfully breeding Atlantic loggerheads with Pacific loggerheads for the last five years.

Weaken Question Problem Set

3. People who have specialized knowledge about a scientific or technical issue are systematically excluded from juries for trials where the issue is relevant. Thus, trial by jury is not a fair means of settling disputes involving such issues.

Which one of the following, if true, most seriously weakens the argument?

- (A) The more complicated the issue being litigated, the less likely it is that a juror without specialized knowledge of the field involved will be able to comprehend the testimony being given.
- (B) The more a juror knows about a particular scientific or technical issue involved in a trial, the more likely it is that the juror will be prejudiced in favor of one of the litigating parties before the trial begins.
- (C) Appointing an impartial arbitrator is not a fair means of settling disputes involving scientific or technical issues, because arbitrators tend to favor settlements in which both parties compromise on the issues.
- (D) Experts who give testimony on scientific or technical issues tend to hedge their conclusions by discussing the possibility of error.
- (E) Expert witnesses in specialized fields often command fees that are so high that many people involved in litigation cannot afford their services.

4. The five senses have traditionally been viewed as distinct yet complementary. Each sense is thought to have its own range of stimuli that are incapable of stimulating the other senses. However, recent research has discovered that some people taste a banana and claim that they are tasting blue, or see a color and say that it has a specific smell. This shows that such people, called synesthiacs, have senses that do not respect the usual boundaries between the five recognized senses.

Which one of the following statements, if true, most seriously weakens the argument?

- (A) Synesthiacs demonstrate a general, systematic impairment in their ability to use and understand words.
- (B) Recent evidence strongly suggests that there are other senses besides sight, touch, smell, hearing, and taste.
- (C) The particular ways in which sensory experiences overlap in synesthiacs follow a definite pattern.
- (D) The synesthetic phenomenon has been described in the legends of various cultures.
- (E) Synesthiacs can be temporarily rid of their synesthetic experiences by the use of drugs.

Weaken Question Problem Set

5. Archaeologist: A skeleton of a North American mastodon that became extinct at the peak of the Ice Age was recently discovered. It contains a human-made projectile dissimilar to any found in that part of Eurasia closest to North America. Thus, since Eurasians did not settle in North America until shortly before the peak of the Ice Age, the first Eurasian settlers in North America probably came from a more distant part of Eurasia.

Which one of the following, if true, most seriously weakens the archaeologist's argument?

- (A) The projectile found in the mastodon does not resemble any that were used in Eurasia before or during the Ice Age.
- (B) The people who occupied the Eurasian area closest to North America remained nomadic throughout the Ice Age.
- (C) The skeleton of a bear from the same place and time as the mastodon skeleton contains a similar projectile.
- (D) Other North American artifacts from the peak of the Ice Age are similar to ones from the same time found in more distant parts of Eurasia.
- (E) Climatic conditions in North America just before the Ice Age were more conducive to human habitation than were those in the part of Eurasia closest to North America at that time.

6. Lobsters and other crustaceans eaten by humans are more likely to contract gill diseases when sewage contaminates their water. Under a recent proposal, millions of gallons of local sewage each day would be rerouted many kilometers offshore. Although this would substantially reduce the amount of sewage in the harbor where lobsters are caught, the proposal is pointless, because hardly any lobsters live long enough to be harmed by those diseases.

Which one of the following, if true, most seriously weakens the argument?

- (A) Contaminants in the harbor other than sewage are equally harmful to lobsters.
- (B) Lobsters, like other crustaceans, live longer in the open ocean than in industrial harbors.
- (C) Lobsters breed as readily in sewage-contaminated water as in unpolluted water.
- (D) Gill diseases cannot be detected by examining the surface of the lobster.
- (E) Humans often become ill as a result of eating lobsters with gill diseases.

Weaken Question Problem Set Answer Key

Question #1. Weaken. The correct answer choice is (B)

This is a nice straightforward question to start the problem set. The conclusion of the argument appears at the end of the stimulus: human beings “cannot be made happy by anything that does not involve gratification of these [cognitive] faculties.” To weaken the argument we must show that individuals can be made happy without gratification of the cognitive faculties. If you do not know the meaning of “cognitive,” the problem can be challenging. Cognitive means “relating to the mental process of knowing, including reasoning and judgment.” In other words, cognitive faculties are thinking and analyzing, etc.

Answer choice (A): This answer attempts to attack the first premise, but fails. Although it is fantastic news that dolphins and chimps can rationally communicate, this fact has no impact on the argument at hand. Even though they have this communication ability, human cognitive faculties can still be superior.

Answer choice (B): This is the correct answer, and a somewhat risqué one at that. By showing that many people enjoy the physical more than the cognitive, the answer shows that people can be made happy by gratification of something other than cognitive faculties. Cognitive faculties, being mental in nature, are of course distinct from physical pleasures.

Additionally, this answer has the benefit of addressing the phrase in the stimulus regarding awareness of cognitive faculties: “once humans become aware of these...” In this answer, unlike others, the individuals are known to be familiar with cognitive faculties. While we believe that recognition of cognitive faculties is inherent in adults (or some of the named types in other answers, such as *serious athletes*, who by definition would have to be teens or adults), this answer is stronger because it explicitly addresses the issue.

Answer choice (C): A preference for a certain type of music is likely a cognition-driven preference, and this preference is expressed by an adult who would certainly be aware of cognitive faculties. And, since no suggestion is made that individuals can be made happy without gratification of the cognitive faculties, this answer is incorrect.

Answer choice (D): This can be an attractive answer at first, but it depends on the assumption that the serious athletes are happy due to their athletic endeavors. However, that connection is not explicitly stated, and it could be that the serious athletes are happy because of some gratification of their cognitive faculties, in their respective sport or otherwise.

Answer choice (E): This answer is similar to answer choice (D). A gourmet is a connoisseur of food and drink, and a connoisseur is a person with deep or special knowledge of a subject. In this sense, there would be a cognitive element to the enjoyment of gourmet food. As such, this answer may serve to slightly strengthen the argument because it shows that an individual with experience with the non-cognitive still retains a love of the cognitive.

Weaken Problem Set Answer Key

Question #2. Weaken. The correct answer choice is (D)

The argument uses the premise that Baja turtles and Japanese turtles share ninety-five percent of their DNA to conclude that Baja turtles hatch in Japanese waters 10,000 kilometers away. This sounds like convincing statistical evidence unless you realize that many organisms share DNA. For example, humans and chimpanzees share about 98% of their DNA (we share about 75% of our DNA with dogs, for that matter). Since Baja and Japanese turtles come from the same species, it is not surprising that they would share a high percentage of their DNA. Regardless of whether or not you saw this connection, you should have been skeptical of the reference to *juvenile* turtles travelling 10,000 kilometers. Such a lengthy trip by a juvenile animal is unlikely, and calls into question the soundness of the argument.

Answer choice (A): This answer does not impact the argument because no details—DNA or otherwise—are given about the turtles at these nesting sites off the Pacific coast of North America.

Answer choice (B): The fact that Atlantic turtles have nesting and feeding sites no more than 5,000 kilometers apart does not attack the argument because the argument is about *Baja* turtles.

Answer choice (C): This answer attempts to weaken the argument by inducing you to conclude that if the Japanese hatchlings are declining but Baja sites are constant, then the Baja sites cannot be supplied by the Japanese hatchlings. But, the answer choice moves from the number of *hatchlings* to the number of *sites*. Even with a declining number of hatchlings, the number of sites could remain constant, albeit with fewer turtles at each. Because of this possibility, the answer does not undermine the argument.

Answer choice (D): This is the correct answer. The answer shows that all turtles in the argument have the same ninety-five percent DNA, meaning that the Baja turtles did not have to take the 10,000 kilometer trip.

Answer choice (E): The breeding between species was not an issue in the stimulus.

Question #3. Weaken. The correct answer choice is (B)

The first sentence is a premise, and the second sentence is the conclusion of this argument. To attack this conclusion, look for an answer choice that shows that the exclusion of knowledgeable individuals from scientific or technical issue trials is a fair way of proceeding in these trials.

Answer choice (A): This is an Opposite answer that strengthens the conclusion. If specialized knowledge of these issues makes it more likely that the juror can comprehend the testimony being given, then these individuals should not be excluded from juries, and their exclusion makes trial by jury an unfair means of resolving a dispute.

Answer choice (B): This is the correct answer. If the specialized knowledge is likely to produce a prejudice in a juror, then by all means they should be excluded from the jury. Thus, instead of trial by jury being an unfair means, it is made more fair by the exclusion of these individuals. The answer is a tricky one because most people initially think the answer agrees with the argument. It agrees with the principle of the premise, but not with the conclusion drawn from that premise.

Weaken Problem Set Answer Key

Answer choice (C): This answer simply notes that arbitrators are not a fair means of settling scientific or technical issue debates. This has no impact on the fairness of jury trials involving these same issues.

Answer choice (D): This answer is about the *experts* testifying at scientific or technical issue trials. This information does not attack the claim that jury trials are unfair because of the exclusion of *jurors* with knowledge of these issues.

Answer choice (E): This answer can be eliminated by reasoning similar to that used to eliminate answer choice (D).

Question #4. Weaken. The correct answer choice is (A)

The conclusion is in the last sentence, that some people “have senses that do not respect the usual boundaries between the five recognized senses.” Instead of keeping their senses distinct, these individuals have an overlap.

Incidentally, the condition discussed in the stimulus is not made up: synesthiacs (or synesthetes) have a real condition known as synesthesia. Regardless of that fact, you must find an answer choice that undermines the conclusion of the argument, something that would suggest their senses do respect the usual boundaries.

Answer choice (A): This is the correct answer. If the synesthiacs have a systematic impairment in their use of language it may not be that their senses overlap but rather that they lack the ability to properly express themselves. Thus, their claim to taste a banana and see blue might not be a reflection of that actually occurring but rather a reflection of the words they use to describe taste. If so, this would undermine the conclusion that the senses of synesthiacs do overlap. This is a difficult answer to identify as correct, and less than 50% of test takers are able to do so.

Answer choice (B): The appeal of this answer—and many students keep this as a Contender—is that it suggests that perhaps other senses are operating, and some test takers make the judgment that these additional senses account for the sensory overlap in synesthiacs. Unfortunately, that judgment is not supported by the answer choice. Not enough information is provided by the answer choice to say what role, if any, is played by these other senses.

Answer choice (C): This is the most popular wrong answer choice. Do not forget to personalize the argument and consider how the author would react if faced with this answer. Would he or she surrender and admit the answer overpowers the argument? Doubtful. The author would probably react to this answer by saying something along these lines, “Exactly. Since all the individuals are synesthiacs and suffer from the same condition, it is not surprising that there would be patterns in the way the senses overlap. Just as everyone afflicted with emphysema has difficulty breathing, the sensory patterns exhibited by synesthiacs are just a product of the condition. The fact that their senses do not follow the usual boundaries and do so in certain ways is to be expected.” So, instead of surrendering to the answer, the author would indicate that the answer agrees with the conclusion.

Weaken Problem Set Answer Key

Answer choice (D): This answer is out of the scope of the argument. The “legendary” status of synesthiacs does not shed any light on the operation of their five senses.

Answer choice (E): If anything, this may strengthen the argument by indicating that the synesthiacs are experiencing some type of phenomenon. Beyond that point, however, no information is given to suggest that their senses respect the usual boundaries.

Question #5. Weaken. The correct answer choice is (A)

The stimulus sets up an interesting argument that appears fairly reasonable. A mastodon skeleton has been found containing a human-made projectile dissimilar to those of the part of Eurasia *closest* to North America and because Eurasians did not settle in North America until shortly before the peak of the Ice Age, the first Eurasian settlers of North America probably came from a *more distant* part of Eurasia than the area nearest North America. To make a very rough analogy using dialects, it is like a resident of Washington, D.C. saying, “The visitors we just met did not sound like they were from Virginia, so they must be from a much more distant part of the U.S.” Reading that rough analogy, you can see that the speaker has assumed that the visitors are from the U.S. Of course, that does not have to be the case—they could be from England or France or elsewhere. The same form of assumption has occurred in the argument, and the author has assumed that the *projectile* is of Eurasian origin.

Answer choice (A): This is the correct answer. This answer hurts the argument by indicating that the projectile is apparently not Eurasian, suggesting that the first Eurasian settlers could have come from any part of Eurasia, including the area closest to North America.

Answer choice (B): This is the most attractive wrong answer, but regardless, this answer does not hurt the argument. Some students attempt to conclude that since the people were nomadic, they could have moved to areas farther away and found projectiles like the one in the mastodon. However, even though these individuals remained nomadic, they were apparently nomadic within the area of Eurasia closest to North America because the answer clearly states, “The people who *occupied* the Eurasia area closest to North America...” Hence, they did not necessarily occupy other areas and this answer does not hurt the argument.

Answer choice (C): This Opposite answer supports the argument by showing that the projectile in the mastodon was not a one-time, anomalous occurrence. If other, similar projectiles come to light, then the author’s position would be strengthened.

Answer choice (D): This Opposite answer supports the argument by connecting other artifacts of the same age as the projectile to parts of Eurasia more distant than the area of Eurasia closest to North America. This adds further evidence to the idea that the first Eurasian settlers of North America probably came from a more distant part of Eurasia than the area nearest North America.

Answer choice (E): This Opposite answer supports the argument by indicating that the part of Eurasia closest to North America may not have been inhabited just before the Ice Age. If this area was uninhabitable, then it is more likely that settlers coming to North America came from more distant regions.

Weaken Problem Set Answer Key

Question #6. Weaken. The correct answer choice is (E)

This is a great separator question, and approximately one student in three answers this question correctly. However, some students are able to annihilate this question because they see a reference in the first line that raises an important issue that goes unanswered. That reference is to lobsters “eaten by humans.” The argument asserts that diverting the sewage in the harbor is a moot point because hardly any lobsters live long enough to be harmed by the diseases caused by the sewage. This may be, but what about the humans who eat the lobsters that live in the sewage-contaminated environment? The author fails to address this point.

The conclusion of the argument is near the end: “the proposal is pointless,” and this is based on the premise that “hardly any lobsters live long enough to be harmed by those diseases.”

Answer choice (A): The argument is based on the sewage contamination of the harbor. Although other contaminants may be present, they are not addressed by the argument, and thus this answer does not undermine the author’s position.

Answer choice (B): This answer has no impact because the argument is about lobsters that are caught *in the harbor*. So, while lobsters in the open ocean may live longer, the author’s point about lobsters in the harbor not living long enough to contract a gill disease is untouched.

Answer choice (C): The issue is not breeding frequency but longevity. So, while we are pleased to hear that lobsters in sewage-contaminated waters breed frequently, this fact does not impact an argument based on the age and disease contraction.

Answer choice (D): Although whether the lobsters contract a gill disease is a critical issue in the argument, the method of determining whether a lobster has a disease is not a critical issue. Again, keep in mind the heart of the argument:

Premise: “hardly any lobsters live long enough to be harmed by those diseases.”

Conclusion: “the proposal [to reroute harbor sewage] is pointless.”

Nothing in that argument concerns the detection of the gill diseases.

Answer choice (E): This is the correct answer. As discussed above, the author fails to address the effect of the contaminated lobsters on humans who consume them, and this answer attacks that hole. If humans become ill as a result of eating lobsters with gill diseases, and gill diseases are more likely to arise when the lobsters live in the sewage-contaminated waters, then the conclusion that the proposal is pointless is incorrect.

C

HAPTER SEVEN: CAUSE AND EFFECT REASONING

What is Causality?

When examining events, people naturally seek to explain why things happened. This search often results in cause and effect reasoning, which asserts or denies that one thing causes another, or that one thing is caused by another. On the GMAT, cause and effect reasoning appears in many Critical Reasoning problems, often in the conclusion where the author mistakenly claims that one event causes another. For example:

Last week IBM announced a quarterly deficit and the stock market dropped 10 points. Thus, IBM's announcement must have caused the drop.

Like the above conclusion, most causal conclusions are flawed because there can be alternate explanations for the stated relationship: another cause could account for the effect; a third event could have caused both the stated cause and effect; the situation may in fact be reversed; the events may be related but not causally; or the entire occurrence could be the result of chance.

In short, causality occurs when one event is said to make another occur. The *cause* is the event that makes the other occur; the *effect* is the event that follows from the cause. By definition, the cause must occur before the effect, and the cause is the “activator” or “ignitor” in the relationship. The effect always happens at some point in time after the cause.

How to Recognize Causality

A cause and effect relationship has a signature characteristic—the cause *makes* the effect happen. Thus, there is an identifiable type of expression used to indicate that a causal relationship is present. The list on the following page contains a number of the phrases used by the makers of the GMAT to introduce causality, and you should be on the lookout for those when reading Critical Reasoning stimuli.

Causality is the most-tested logical concept in GMAT Critical Reasoning stimuli. The second most tested concept is Numbers and Percentages, which will be addressed in Chapter Twelve.

As mentioned before, this is a book about GMAT logic, not general philosophy. Therefore, we will not go into an analysis of David Hume's *Inquiry* or Mill's *Methods* (both of which address causality) because although those discussions are interesting, they do not apply to the GMAT.

The following terms often introduce a cause and effect relationship:

Be sure to
memorize this
list!

caused by
because of
responsible for
reason for
leads to
induced by
promoted by
determined by
produced by
product of
played a role in
was a factor in
is an effect of

Because of the variety of the English language, there are many alternate phrases that can introduce causality. However, those phrases would all have the similar characteristic of suggesting that one event *made* another occur.

Causality in the Conclusion versus Causality in the Premises

Causal statements can be found in the premise or conclusion of an argument. If the causal statement is the conclusion, then the reasoning is flawed. If the causal statement is the premise, then the argument may be flawed, but not because of the causal statement. Because of this difference, one of the critical issues in determining whether flawed causal reasoning is present is identifying where in the argument the causal assertion is made. The classic mistaken cause and effect reasoning we will refer to throughout this book occurs when a causal assertion is made in the *conclusion*, or the conclusion presumes a causal relationship. Let us examine the difference between an argument with a causal premise and one with a causal conclusion.

This is an argument with a causal conclusion:

Premise: In North America, people drink a lot of milk.

Premise: There is a high frequency of cancer in North America.

Conclusion: Therefore, drinking milk causes cancer.

In this case, the author takes two events that occur together and concludes that one causes the other. This conclusion is in error for the reasons discussed on the first page of this chapter.

If a causal claim is made in the premises, however, then no *causal* reasoning error exists in the argument (of course, the argument may be flawed in other

In the GMAT world, when a cause and effect statement appears as the conclusion, the conclusion is flawed. In the real world that may not be the case because a preponderance of evidence can be gathered or visual evidence can be used to prove a relationship.

ways). As mentioned previously, the makers of the GMAT tend to allow premises to go unchallenged (they are more concerned with the reasoning that follows from a premise) and it is considered acceptable for an author to begin his argument by stating a causal relationship and then continuing from there:

- Premise: Drinking milk causes cancer.
- Premise: The residents of North America drink a lot of milk.
- Conclusion: Therefore, in North America there is a high frequency of cancer among the residents.

The second example is considered valid reasoning because the author takes a causal principle and follows it to its logical conclusion. Generally, causal reasoning occurs in a format similar to the first example, but there are GMAT problems similar to the second example.

Situations That Can Lead to Errors of Causality

There are two scenarios that tend to lead to causal conclusions in Critical Reasoning questions:

1. One event occurs before another

When one event occurs before another event, many people fall into the trap of assuming that the first event caused the second event. This does not have to be the case, as shown by the following famous example:

Every morning the rooster crows before the sun rises. Hence, the rooster must cause the sun to rise.

The example contains a ludicrous conclusion, and shows why it is dangerous to simply assume that the first event must have caused the second event.

2. Two (or more) events occur at the same time

When two events occur simultaneously, many people assume that one event caused the other. While one event could have caused the other, the two events could be the result of a third event, or the two events could simply be correlated without one causing the other.

The following example shows how a third event can cause both events:

The consumption of ice cream has been found to correlate with the murder rate. Therefore, consuming ice cream must cause one to be more likely to commit murder.

If you have taken a logic course, you will recognize the first scenario produces the *Post Hoc, Ergo Propter Hoc* fallacy.

In the second example, the two events could simply be correlated. A positive correlation is a relationship where the two values move together. A negative correlation is one where the two values move in opposite directions, such as with age and eyesight (the older you get, the worse your eyesight gets).

As you might imagine, the conclusion of the example does not have to be true (yes, go ahead and eat that Ben and Jerry's!), and the two events can be explained as the effects of a single cause: hot weather. When the weather is warmer, ice cream consumption and the murder rate tend to rise (this example is actually true, especially for large cities).

The Central Assumption of Causal Conclusions

Understanding the assumption that is at the heart of a causal conclusion is essential to knowing why certain answers will be correct or incorrect. Most students assume that the GMAT makes basic assumptions that are similar to the real world; this is untrue and is a dangerous mistake to make.

Understanding this assumption is absolutely critical to your GMAT success. The makers of the test will closely examine your knowledge of this idea, especially in Strengthen and Weaken questions.

When we discuss causality in the real world, there is an inherent understanding that a given cause is just one possible cause of the effect, and that there are other causes that could also produce the same effect. This is reasonable because we have the ability to observe a variety of cause and effect scenarios, and experience shows us that different actions can have the same result. The makers of the GMAT do *not* think this way. When a GMAT speaker concludes that one occurrence caused another, that speaker also assumes that the stated cause is the *only* possible cause of the effect and that consequently the stated cause will *always* produce the effect. This assumption is incredibly extreme and far-reaching, and often leads to surprising answer choices that would appear incorrect unless you understand this assumption. Consider the following example:

- | | |
|-------------|--|
| Premise: | Average temperatures are higher at the equator than in any other area. |
| Premise: | Individuals living at or near the equator tend to have lower per-capita incomes than individuals living elsewhere. |
| Conclusion: | Therefore, higher average temperatures cause lower per-capita incomes. |

This argument is a classic flawed causal argument wherein two premises with a basic connection (living at the equator) are used as the basis of a conclusion that states that the connection is such that one of the elements actually makes the other occur. The conclusion is flawed because it is not necessary that one of the elements caused the other to occur: the two could simply be correlated in some way or the connection could be random.

In the real world, we would tend to look at an argument like the one above and think that while the conclusion is possible, there are also other things that could cause the lower per-capita income of individuals residing at or near the equator,

such as a lack of natural resources. *This is not how speakers on the GMAT view the relationship.* When a GMAT speaker makes an argument like the one above, he or she believes that the *only* cause is the one stated in the conclusion and that there are *no other* causes that can create that particular effect. Why is this the case? Because for a GMAT speaker to come to that conclusion, he or she must have weighed and considered every possible alternative and then rejected each one. Otherwise, why would the speaker draw the given conclusion? In the final analysis, to say that higher average temperatures cause lower per-capita incomes the speaker must also believe that nothing else could be the cause of lower per-capita incomes.

Thus, in every argument with a causal conclusion that appears on the GMAT, the speaker believes that the stated cause is in fact the only cause and all other theoretically possible causes are not, in fact, actual causes. This is an incredibly powerful assumption, and the results of this assumption are most evident in Weaken, Strengthen, and Assumption questions. We will discuss this effect on Strengthen and Assumption questions in a later chapter. Following is a brief analysis of the effect of this assumption on Weaken questions.

How to Attack a Causal Conclusion

Whenever you identify a causal relationship in the conclusion of a GMAT problem, immediately prepare to either weaken or strengthen the argument. Attacking a cause and effect relationship in Weaken questions almost always consists of performing one of the following tasks:

A. Find an alternate cause for the stated effect

Because the author believes there is only one cause, identifying another cause weakens the conclusion.

B. Show that even when the cause occurs, the effect does not occur

This type of answer often appears in the form of a counterexample. Because the author believes that the cause always produces the effect, any scenario where the cause occurs and the effect does not weakens the conclusion.

C. Show that although the effect occurs, the cause did not occur

This type of answer often appears in the form of a counterexample. Because the author believes that the effect is always produced by the same cause, any scenario where the effect occurs and the cause does not weakens the conclusion.

Answer choices that otherwise appear irrelevant will suddenly be obviously correct when you understand the central causal assumption.

Stimuli containing causal arguments are often followed by Weaken, Strengthen, Assumption, or Flaw questions.

D. Show that the stated relationship is reversed

Because the author believes that the cause and effect relationship is correctly stated, showing that the relationship is backwards (the claimed effect is actually the cause of the claimed cause) undermines the conclusion.

E. Show that a statistical problem exists with the data used to make the causal statement

If the data used to make a causal statement are in error, then the validity of the causal claim is in question.

Diagramming Causality

Causal statements can be quickly and easily represented by an arrow diagram, and in this book we use designators ("C" for cause and "E" for effect) above the terms when diagramming. We use these designators to make the meaning of the diagram clear. During the GMAT, however, students should not write out the designators on the scratch paper (they should just use the arrow diagram) because they want to go as fast as possible.

Here is an example of a causal diagram:

Statement: "Smoking causes cancer."

S = smoking
C = cancer

C E
S → C

During the GMAT, the choice to create an arrow diagram for a causal statement is yours.

As you diagram a causal statement, you will face a decision about how to represent each element of the relationship. Because writing out the entire condition would be onerous, the best approach is to use a symbol to represent each condition. For example, we have already used "S" to represent the idea of "smoking." The choice of symbol is yours, and different students will choose different representations. For example, to represent a phrase such as "they must have studied for the test," you could choose "Study" or the more efficient "S." Whatever you decide to choose, the symbolization must make sense to you and it must be clear. Regardless of how you choose to diagram an element, once you use a certain representation within a problem, stick with that representation throughout the duration of the question.

Two Cause and Effect Problems Analyzed

Please take a moment to complete the following problem:

1. People with high blood pressure are generally more nervous and anxious than people who do not have high blood pressure. This fact shows that this particular combination of personality traits—the so-called hypertensive personality—is likely to cause a person with these traits to develop high blood pressure.

The reasoning in the argument is most vulnerable to criticism on the grounds that the argument

- (A) fails to define the term “hypertensive personality”
- (B) presupposes that people have permanent personality traits
- (C) simply restates the claim that there is a “hypertensive personality” without providing evidence to support that claim
- (D) takes a correlation between personality traits and high blood pressure as proof that the traits cause high blood pressure
- (E) focuses on nervousness and anxiety only, ignoring other personality traits that people with high blood pressure might have

This is a Flaw in the Reasoning question and although we have not yet discussed this question type, based on your knowledge of causal reasoning we can proceed without a detailed understanding of the question form. You should have identified the following argument structure in the question above:

- Premise: People with high blood pressure are generally more nervous and anxious than people who do not have high blood pressure.
- Premise: This particular combination of personality traits is called the hypertensive personality.
- Conclusion: The hypertensive personality is likely to cause a person to develop high blood pressure.

The premises indicate that certain individuals have both high blood pressure and the hypertensive personality. From this information we cannot draw any conclusions, but the author makes the classic GMAT error of concluding that one of the conditions causes the other. Your job is to find the answer that describes this error of reasoning.

Flaw in the Reasoning questions will be covered in Chapter Ten.

From the “Situations That Can Lead to Errors of Causality” discussion, the scenario in this stimulus falls under item 2—“Two (or more) events occur at the same time.” As described in that section, “While one event could have caused the other, the two events could be the result of a third event, or the two events could simply be correlated without one causing the other.” Thus, you should search either for an answer that states that the author forgot that a third event could have caused the two events or that the author mistook correlation for causation. Answer choice (D) describes the latter.

Answer choice (A): This is an Opposite answer because the stimulus defines the hypertensive personality as one with the traits of nervousness and anxiety.

Answer choice (B): The permanence of the traits is not an issue in the stimulus.

Answer choice (C): Although the argument does act as described in this answer choice, this is not an error. On the GMAT, authors have the right to make premises that contain certain claims. Remember, the focus is not on the premises but where the author goes with the argument once a premise is created.

Answer choice (D): This is the correct answer. The conclusion can be diagrammed as:

HP = hypertensive personality

HBP = high blood pressure

C

E

HP —————> HBP

This answer choice describes a classic error of causality: two events occurring simultaneously are mistakenly interpreted to be in a causal relationship. There are many other possibilities for the arrangement: the two events could be caused by a third event (for example, genetics could cause both a hypertensive personality and high blood pressure), the events could be reversed (the high blood pressure could actually cause the hypertensive personality), or there may be situations where the two do not occur together.

Answer choice (E): Although the argument does act as described in this answer choice, this is not an error. The author is allowed to focus on nervousness and anxiety to the exclusion of other traits. To analogize, imagine a speaker says, “The Kansas City Royals have bad pitching and this makes them a bad team.” The Kansas City Royals might also wear blue, but the speaker is not obligated to mention that trait when discussing why the Royals are a bad baseball team. In much the same way, the author of this stimulus is not obligated to mention other traits people with high blood pressure may have.

Please take a moment to complete the following problem:

2. High school students who feel that they are not succeeding in high school often drop out before graduating and go to work. Last year, however, the city's high school dropout rate was significantly lower than the previous year's rate. This is encouraging evidence that the program instituted two years ago to improve the morale of high school students has begun to take effect to reduce dropouts.

Which one of the following, if true about the last year, most seriously weakens the argument?

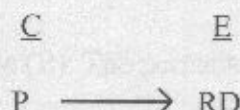
- (A) There was a recession that caused a high level of unemployment in the city.
- (B) The morale of students who dropped out of high school had been low even before they reached high school.
- (C) As in the preceding year, more high school students remained in school than dropped out.
- (D) High schools in the city established placement offices to assist their graduates in obtaining employment.
- (E) The antidropout program was primarily aimed at improving students' morale in those high schools with the highest dropout rates.

A good portion of the GMAT is about recognition of existing patterns. Recognizing these patterns in a stimulus will help you increase your speed and accuracy.

The argument concludes that a program instituted two years ago to increase morale has ultimately caused the recent decrease in high school dropouts. You must always recognize a causal conclusion when one is presented to you! Whenever you encounter a causal conclusion, ask yourself if the relationship must be as stated by the author or if another explanation can be found.

In simplified form, the conclusion appears as follows:

P = program to raise high school morale
RD = reduction in dropouts



Regardless of the question asked, this assessment is helpful. The question stem asks you to weaken the argument, and according to the “How to Attack a Causal Conclusion” section there are five main avenues of attack you should be prepared to encounter. The correct answer, (A), falls into one of the most frequently occurring of those categories—the alternate cause.

Answer choice (A): This is the correct answer. The answer attacks the conclusion by introducing an alternate cause: it was not the morale program that led to a decrease in high dropouts, but rather the fact that fewer jobs were available for individuals contemplating dropping out of high school. The job availability factor is important because the first sentence of the stimulus indicates that high school students who drop out go to work. Thus, if a recession led to a high level of unemployment, this could cause high school students to rethink dropping out and stay in school.

Answer choice (B): At best, the answer choice is irrelevant. At worst, this answer confirms that some of the high school students had low morale, and in that sense, the answer strengthens the argument.

Answer choice (C): The argument indicates that the dropout rate is *lower* relative to the preceding year; there is no claim that the dropout rate ever exceeded the retention rate. Thus, to suggest that more students stayed in school than dropped out has no effect on the argument.

Answer choice (D): This is a Shell Game answer. The stimulus refers to high school dropouts. This answer choice refers to high school *graduates*.

Answer choice (E): The argument uses information about the city’s *overall* dropout rate. Therefore, the target high schools of the antidropout program are irrelevant.

Causal Reasoning Review

Causality occurs when one event is said to make another occur. The *cause* is the event that makes the other occur; the *effect* is the event that follows from the cause.

Most causal conclusions are flawed because there can be alternate explanations for the stated relationship: some other cause could account for the effect; some third event could have caused both the stated cause and effect; the situation may in fact be reversed; the events may be related but not causally; or the entire occurrence could be the result of chance.

Causal statements can be used in the premise or conclusion of an argument. If the causal statement is the conclusion, then the reasoning is flawed. If the causal statement is a premise, then the argument may be flawed, but not because of the causal statement.

There are two scenarios that tend to lead to causal conclusions in Critical Reasoning questions:

1. One event occurs before another
2. Two (or more) events occur at the same time

When a GMAT speaker concludes that one occurrence caused another, that speaker also assumes that the stated cause is the *only* possible cause of the effect and that the stated cause will *always* produce the effect.

In Weaken questions, attacking a cause and effect relationship almost always consists of performing one of the following tasks:

- A. Find an alternate cause for the stated effect
- B. Show that even when the cause occurs, the effect does not occur
- C. Show that although the effect occurs, the cause did not occur
- D. Show that the stated relationship is in fact reversed
- E. Show a statistical problem exists with the data used to make the causal statement

Final Note

Causal reasoning occurs in many different question types, and the discussion in this chapter is designed to acquaint you with situations that produce causal statements, how to identify a causal statement, and some of the ways that causality appears in GMAT problems. We will revisit these concepts as we discuss other question types.

As you examine GMAT questions, remember that causal reasoning may or may not be present in the stimulus. Your job is to recognize causality when it appears and react accordingly. If causality is not present, you do not need to worry about it.

On the following page is a short problem set to help you work with some of the ideas. The problem set is followed by an answer key with explanations. Good luck!

Causal Reasoning Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 145*

1. The number of airplanes equipped with a new anticollision device has increased steadily during the past two years. During the same period, it has become increasingly common for key information about an airplane's altitude and speed to disappear suddenly from air traffic controllers' screens. The new anticollision device, which operates at the same frequency as air traffic radar, is therefore responsible for the sudden disappearance of key information.

Which one of the following, if true, most seriously weakens the argument?

- (A) The new anticollision device has already prevented a considerable number of mid-air collisions.
- (B) It was not until the new anticollision device was introduced that key information first began disappearing suddenly from controllers' screens.
- (C) The new anticollision device is scheduled to be moved to a different frequency within the next two to three months.
- (D) Key information began disappearing from controllers' screens three months before the new anticollision device was first tested.
- (E) The sudden disappearance of key information from controllers' screens has occurred only at relatively large airports.

2. Most antidepressant drugs cause weight gain. While dieting can help reduce the amount of weight gained while taking such antidepressants, some weight gain is unlikely to be preventable.

The information above most strongly supports which one of the following?

- (A) A physician should not prescribe any antidepressant drug for a patient if that patient is overweight.
 - (B) People who are trying to lose weight should not ask their doctors for an antidepressant drug.
 - (C) At least some patients taking antidepressant drugs gain weight as a result of taking them.
 - (D) The weight gain experienced by patients taking antidepressant drugs should be attributed to lack of dieting.
 - (E) All patients taking antidepressant drugs should diet to maintain their weight.
3. Violent crime in this town is becoming a serious problem. Compared to last year, local law enforcement agencies have responded to 17 percent more calls involving violent crimes, showing that the average citizen of this town is more likely than ever to become a victim of a violent crime.

Which one of the following, if true, most seriously weakens the argument?

- (A) The town's overall crime rate appears to have risen slightly this year compared to the same period last year.
- (B) In general, persons under the age of 65 are less likely to be victims of violent crimes than persons over the age of 65.
- (C) As a result of the town's community outreach programs, more people than ever are willing to report violent crimes to the proper authorities.
- (D) In response to worries about violent crime, the town has recently opened a community center providing supervised activities for teenagers.
- (E) Community officials have shown that a relatively small number of repeat offenders commit the majority of violent crimes in the town.

Causal Reasoning Problem Set

4. Medical researcher: As expected, records covering the last four years of ten major hospitals indicate that babies born prematurely were more likely to have low birth weights and to suffer from health problems than were babies not born prematurely. These records also indicate that mothers who had received adequate prenatal care were less likely to have low birth weight babies than were mothers who had received inadequate prenatal care. Adequate prenatal care, therefore, significantly decreases the risk of low birth weight babies.

Which one of the following, if true, most weakens the medical researcher's argument?

- (A) The hospital records indicate that many babies that are born with normal birth weights are born to mothers who had inadequate prenatal care.
 - (B) Mothers giving birth prematurely are routinely classified by hospitals as having received inadequate prenatal care when the record of that care is not available.
 - (C) The hospital records indicate that low birth weight babies were routinely classified as having been born prematurely.
 - (D) Some babies not born prematurely, whose mothers received adequate prenatal care, have low birth weights.
 - (E) Women who receive adequate prenatal care are less likely to give birth prematurely than are women who do not receive adequate prenatal care.
5. Researcher: People with certain personality disorders have more theta brain waves than those without such disorders. But my data show that the amount of one's theta brain waves increases while watching TV. So watching too much TV increases one's risk of developing personality disorders.

A questionable aspect of the reasoning above is that it

- (A) uses the phrase "personality disorders" ambiguously
- (B) fails to define the phrase "theta brain waves"
- (C) takes a correlation to imply a causal connection
- (D) draws a conclusion from an unrepresentative sample of data
- (E) infers that watching TV is a consequence of a personality disorder

6. Unlike newspapers in the old days, today's newspapers and televised news programs are full of stories about murders and assaults in our city. One can only conclude from this change that violent crime is now out of control, and, to be safe from personal attack, one should not leave one's home except for absolute necessities.

Which one of the following, if true, would cast the most serious doubt on the conclusion?

- (A) Newspapers and televised news programs have more comprehensive coverage of violent crime than newspapers did in the old days.
- (B) National data show that violent crime is out of control everywhere, not just in the author's city.
- (C) Police records show that people experience more violent crimes in their own neighborhoods than they do outside their neighborhoods.
- (D) Murder comprised a larger proportion of violent crimes in the old days than it does today.
- (E) News magazines play a more important role today in informing the public about crime than they did in the old days.

Causal Reasoning Problem Set Answer Key

Question #1. The correct answer choice is (D)

The stimulus commits the classic error of assuming that because two events occur simultaneously that one must cause the other. The phrase used to indicate causality is “responsible for.”

D = anticollision device

SD = sudden disappearance of key information

C

E

D —————> SD

The question stem asks you to weaken the argument, and according to the “How to Attack a Causal Conclusion” section you should be on the lookout for one of several primary methods of attacking the argument.

Answer choice (A): This answer presents *another effect* of the cause, but this additional effect does not weaken the argument. To analogize this answer to a different argument, imagine a scenario where a speaker concludes that playing football makes a person more prone to sustaining a leg injury. Would suggesting that playing football makes a person more prone to a head injury (another effect) undermine the first statement? No.

Answer choice (B): This is an Opposite answer that supports the conclusion. By showing that the key information did not disappear prior to the appearance of the anticollision device, the argument is strengthened because the likelihood that the device is at fault is increased.

Answer choice (C): This information has no effect on determining if the device causes the information to disappear from the screen because it references an event that has yet to occur.

Answer choice (D): This is the correct answer, and this answer falls into the third category for weakening a causal argument: “Show that although the effect exists, the cause did not occur.” In this instance, the effect of information disappearing from the screen occurred prior to the creation of the supposed causal agent, the anticollision device.

Answer choice (E): This answer choice has no impact on the argument. We cannot make a judgment based on the size of the airport because the argument did not mention airport size or anything directly related to airport size.

Causal Reasoning Problem Set Answer Key

Question #2. Must-CE. The correct answer choice is (C)

The causal relationship in this problem appears in the premise, and the argument is structured as follows:

Premise: Most antidepressant drugs cause weight gain.

Premise: Dieting can help reduce the amount of weight gained while taking such antidepressants

Conclusion: Some weight gain is unlikely to be preventable.

Note that the causal premise specifically states that “most” antidepressants cause weight gain, not necessarily all antidepressants. Also, the second premise specifically refers to antidepressants causing weight gain (the use of “such” indicates this). The second premise also indicates that the *amount gained* can be reduced, not that dieting can stop weight gain. Perhaps the antidepressants cause a twenty pound weight gain, but dieting can reduce that to a ten pound total gain.

The question stem is a Must Be True, and thus you must accept the stimulus information and find an answer that is proven by that information.

Answer choice (A): This is an Exaggerated answer. The stimulus indicates that *most* antidepressants cause weight gain, leaving open the possibility that some do not. This answer choice references *any* antidepressant drug. Further, the stimulus does not address the role of a physician or the advisability of prescribing certain drugs under certain conditions. The benefits of prescribing an antidepressant that causes weight gain to an overweight patient may well outweigh the negatives (pun intended).

Answer choice (B): This is also an Exaggerated answer. The stimulus allows for antidepressants that do not cause weight gain.

Answer choice (C): This is the correct answer. Some individuals taking antidepressants that cause weight gain will gain weight even though dieting can reduce the amount of the gain.

Answer choice (D): This is an Opposite answer. The stimulus and correct answer both indicate that people taking the weight gain-causing antidepressants will gain weight regardless of whether they diet. Thus, the weight gain cannot be attributed to a lack of dieting.

Answer choice (E): This answer is too strong. Not all patients necessarily take antidepressants that cause weight gain, so those that do not might not need to diet to maintain their weight. Also, some patients who do take weight gain-causing antidepressants might be too thin for their own good and could benefit from a weight gain-causing antidepressant.

Causal Reasoning Problem Set Answer Key

Question #3. Weaken-CE. The correct answer choice is (C)

The premise contains information concerning a rise in the number of calls involving violent crimes compared to last year. This is where smart GMAT reading comes into play: does the argument say there is more crime, or does it say there are more *calls* reporting crime? Recognizing the difference is critical for successfully solving this problem. The conclusion about citizens being more likely to be victimized by a violent crime indicates the author believes the following causal relationship:

GNC = greater number of violent crimes
MC = more calls involving violent crimes

C E
GNC → MC

Literally, the author believes that there are more violent crimes and therefore the police are responding to more violent crime calls.

The question stem asks you to weaken the argument, and the correct answer falls into one of the five basic methods for weakening a causal argument.

Answer choice (A): This is an Opposite answer that strengthens the argument.

Answer choice (B): Because the argument is about “the average citizen of this town,” information about victims of a certain age is not relevant.

Answer choice (C): This is the correct answer. By showing that people are more willing to report crimes (and thus call them in for response), an alternate cause for the rise in the number of calls is given.

Answer choice (D): This answer only addresses an effect of the concern over crime, and does not address the causal relationship that underlies the argument.

Answer choice (E): This answer does not address a possible rise in crime or the reasons for the rise in responses to calls involving violent crime.

Causal Reasoning Problem Set Answer Key

Question #4. Weaken-CE. The correct answer choice is (B)

The premises contain correlations, and the conclusion makes a causal claim:

PC = adequate prenatal care

DR = decrease risk of low birth weight babies

C E

PC $\longrightarrow$ DR

The question stem asks you to weaken the argument, and the correct answer falls into one of the five basic methods for weakening a causal argument.

Answer choice (A): The conclusion specifically states that mothers who had received adequate prenatal care were *less likely* to have low birth weight babies than mothers who had received inadequate prenatal care. Thus, although mothers who received inadequate prenatal care have a higher likelihood of having low birth weight babies, this likelihood still allows for many babies to be born of normal weight. In a later chapter we will explore the ways the GMAT uses numbers and statistics to confuse test takers, but for now, consider this analogy: The Detroit Tigers are more likely to lose a baseball game than any other team, but even so, they can still win a number of games. In the same way, the aforementioned mothers may be more likely to have low birth weight babies, but they can still give birth to babies of normal weight. Hence, answer choice (A) does not attack the argument.

Answer choice (B): This is the correct answer. The answer choice falls into the category of "Showing a statistical problem exists with the data used to make the causal statement." By indicating that mothers without prenatal care records are automatically classified as mothers receiving inadequate prenatal care, the answer undermines the relationship in the argument because the data used to make the conclusion is unreliable.

Answer choice (C): The conclusion is about low birth weight babies, not premature babies. Even if low birth weight babies were routinely classified as premature, that would not affect the conclusion.

Answer choice (D): Similar to answer choice (A), the likelihoods discussed in the stimulus allow for this possibility. Hence, this answer cannot hurt the argument.

Answer choice (E): If anything, this answer strengthens the argument since it shows that adequate prenatal care has a powerful positive effect.

Causal Reasoning Problem Set Answer Key

Question #5. Flaw-CE. The correct answer choice is (C)

This Flaw in the Reasoning problem is very similar to the Flaw problem discussed in the chapter (problem #1). A correlation involving theta waves, TV watching, and personality disorders is presented in the premises, and then the author concludes that watching too much TV causes a rise in the risk of developing a personality disorder.

Answer choice (A): Although “personality disorders” are left largely undefined (which is acceptable), the term is not used ambiguously.

Answer choice (B): This is not an error because the author is not obligated to define theta brain waves in order to make the argument understandable.

Answer choice (C): This is the correct answer.

Answer choice (D): There is no information to prove that the sample of data used was unrepresentative. Although the researcher says, “my data show...” it is possible the researcher’s data are extensive and representative.

Answer choice (E): This is a Shell Game answer because the researcher infers that the reverse is true.

Question #6. Weaken-CE. The correct answer choice is (A)

The heart of the argument is a causal claim that the reason today’s newspapers are full of stories about violent crime is that violent crime has now risen to a point where it is out of control.

MVC = more violent crimes

MNS = more news stories about violent crimes

C

E

MVC → MNS

On the basis of this relationship, the author adds for good measure that one should not leave one’s home!

From a form standpoint, this problem is very similar to #3 in this problem set. This is one of the keys to the GMAT—you must recognize the patterns that exist within the test and then capitalize on them when they appear. All the problems in the set include causality. From this point on, you must recognize causality when it appears and then properly respond to it. Your ability to recognize these forms will give you an advantage in both speed and confidence, and ultimately raise your score.

Answer choice (A): This is the correct answer. This answer presents an alternate cause to the scenario presented above, namely that more comprehensive coverage leads to more news stories, not more violent crime.

Causal Reasoning Problem Set Answer Key

Answer choice (B): This Opposite answer strengthens the argument.

Answer choice (C): This answer strengthens the argument, if anything.

Answer choice (D): This is an answer that many people select. The answer is incorrect because it fails to account for other violent crimes beside murder. Indicating that murder comprised a higher percentage of violent crimes in the old days than today does not address the total number of crimes being committed. Since the argument concludes that “*violent crime is now out of control*,” this answer is incorrect. Consider the following example:

	<u>Old Days</u>	<u>Today</u>
Total number of murders	3	1,000
Total number of violent crimes	4	50,000
Percentage of violent crimes that are murders	75%	2%

In this example, although murder was a higher proportion of the violent crimes in the old days, today there are many more violent crimes. This shows that the scenario in the answer choice does not have to undermine the argument. In the chapter on Numbers and Percentages we will revisit the concept of proportion versus total numbers and discuss how the test makers use numerical ideas to attack test takers.

Answer choice (E): The role played by magazines in informing the public does not address why there are so many stories about violent crime or whether violent crime is now out of control.

C

HAPTER EIGHT: STRENGTHEN, AND ASSUMPTION QUESTIONS

The Second Family

With this chapter, we begin our exposition of the Second Family of questions. Two of the question types within this family—Strengthen and Assumption—are considered to be among the hardest Critical Reasoning question types. These two question types are closely related and will be examined consecutively in this chapter. The remaining Second Family question type—Resolve the Paradox—will be examined in the next chapter.

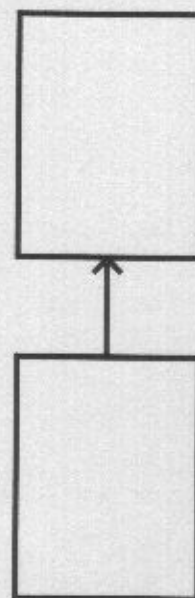
Although all Second Family question types are related by their shared information model, there are distinct differences between each question type that ultimately determine the exact nature of the correct answer. Your performance on these questions will depend on your ability to distinguish each question type and understand the task you must fulfill.

Some students compare the Second Family information model diagram to the Third Family (Weaken) model and assume the two groups are exact opposites. While Strengthen and Weaken questions require you to perform opposite tasks, there are many similarities between the two types in terms of how information is used in each question. Assumption questions are variations on the Strengthen theme.

In addition to the Primary Objectives, keep these fundamental rules in mind when approaching Strengthen and Assumption questions:

1. The stimulus will contain an argument. Because you are being asked about the author's reasoning, and reasoning requires a conclusion, an argument will almost always be present. In order to maximize your chances of success you must identify, isolate, and assess the premises and the conclusion of the argument. Only by understanding the structure of the argument can you gain the perspective necessary to understand the author's position.
2. Focus on the conclusion. Almost all correct answer choices impact the conclusion. The more you know about the specifics of the conclusion, the better armed you will be to differentiate between correct and incorrect answers.
3. The information in the stimulus is suspect. There are often reasoning errors present, and you must read the argument very carefully in

Second Family
Information
Model:



order to know how to shore up the argument.

4. These questions often yield strong prephrases. Make sure you actively consider the range of possible answers before proceeding to the answer choices.
5. The answer choices are accepted as given, even if they include “new” information. Like Weaken questions, the answer choices to the problems in this chapter can bring into consideration information outside of or tangential to the stimulus. Just because a fact or idea is not mentioned in the stimulus is *not* grounds for dismissing an answer choice.

By following the Primary Objectives and focusing on the points above, you will maximize your chances for success on these questions.

The Difference Between Strengthen and Assumption Questions

Chapter Three contained a basic definition of each question type. Now we will expand those definitions and compare and contrast each type:

Strengthen questions ask you to support the argument in any way possible. This type of answer has great range, as the additional support provided by the answer choice could be relatively minor or major. Speaking in numerical terms, any answer choice that strengthens the argument, whether by 1% or by 100%, is correct.

Assumption questions ask you to identify a statement that the argument assumes or supposes. An assumption is simply an unstated premise—what must be true in order for the argument to be true. An assumption can therefore be defined as something that is *necessary* for the argument to be true.

Because the two question types are confusingly similar, let’s use a simple example to clarify the difference among the correct answer choices that appear with each question type:

An argument concludes that a teenager is an outstanding golfer.

- In an Assumption question, the correct answer could be: “The teenager almost always hits the ball” or “The teenager almost never swings and misses the ball.” Either statement is an assumption of the argument; otherwise how could the teenager be an outstanding golfer?

An assumption is simply an unstated premise of the argument.

In a Strengthen question, the correct answer could be: "The teenager won a local club tournament." This answer choice supports the idea that the teenager is an outstanding golfer, but does not undeniably prove the teenager to be outstanding (what if the tournament was composed primarily of pre-teen players?) nor is the answer an assumption of the conclusion.

Whether you are finding an assumption of the argument or strengthening the conclusion, you are doing something positive for the stimulus.

Admittedly, this is a simple example, but take a moment to examine the different types of answers to each question.

Strengthen Questions

Strengthen questions ask you to identify the answer choice that best supports the argument. The correct answer choice does not necessarily justify the argument, nor is the correct answer choice necessarily an assumption of the argument. The correct answer choice simply helps the argument in some way.

Most Strengthen question stems typically contain the following two features:

1. The stem uses the word "strengthen" or a synonym. Following are some examples of words or phrases used to indicate that your task is to strengthen the argument:

strengthen
support
helps
most justifies

2. The stem indicates that you should accept the answer choices as true, usually with the following phrase:

"Which of the following, if true, ..."

Following are several Strengthen question stem examples:

"Which of the following, if true, most strengthens the argument?"

"Which of the following, if true, most strongly supports the statement above?"

"Which of the following, if true, does most to justify the conclusion above?"

"Each of the following, if true, supports the claim above EXCEPT:"

How to Strengthen an Argument

Use the following points to effectively strengthen arguments:

1. Identify the conclusion—this is what you are trying to strengthen!

Because Strengthen questions are the polar opposite of Weaken questions, the correct approach to supporting an GMAT argument is to help the author's conclusion. When evaluating an answer, ask yourself, "Would this answer choice assist the author in some way?" If so, you have the correct answer.

2. Personalize the argument.

Personalizing allows you to see the argument from a very involved perspective and helps you assess the strength of each answer.

3. Look for weaknesses in the argument.

This may seem like a strange recommendation since your task is to strengthen the argument, but a weak spot in an argument is tailor-made for an answer that eliminates that weakness. If you see a weakness or flaw in the argument, look for an answer that eliminates the weakness. In other words, close any gap or hole in the argument.

Many Strengthen questions require students to find the missing link between a premise and the conclusion. These missing links are assumptions made by the author, and bringing an assumption to light strengthens the argument because it validates part of the author's thinking. This idea will be discussed further in the Assumption section of this chapter.

4. Arguments that contain analogies or use surveys rely upon the validity of those analogies and surveys. Answer choices that strengthen the analogy or survey, or establish their soundness, are usually correct.
5. Remember that the correct answer can strengthen the argument just a little or a lot. This variation is what makes these questions difficult.

Three Incorrect Answer Traps

The same type of wrong answer traps appear in Strengthen as in Weaken questions:

1. **Opposite Answers.** These answers do the exact opposite of what is needed—they weaken the argument. Because of their direct relation to the conclusion they are tempting, despite the fact that they result in consequences opposite of those intended.
2. **Shell Game Answers.** Remember, a Shell Game occurs when an idea or concept is raised in the stimulus and then a very similar idea appears in the answer choice, but the idea is changed just enough to be incorrect but still attractive. In Strengthen questions, the Shell Game is usually used to support a conclusion that is similar to, but slightly different from, the one presented in the stimulus.
3. **Out of Scope Answers.** These answers simply miss the point of the argument and support issues that are either unrelated to the argument or tangential to the argument.

These three answer types are not the only ways an answer choice can be attractively incorrect, but they appear frequently enough that you should be familiar with each form.

The stimuli for Strengthen and Weaken questions tend to be similar: both often contain faulty reasoning.

Strengthen Questions Analyzed

Please take a moment to complete the following problem:

1. Advertisement: At most jewelry stores, the person assessing the diamond is the person selling it so you can see why an assessor might say that a diamond is of higher quality than it really is. But because all diamonds sold at Gem World are certified in writing, you're assured of a fair price when purchasing a diamond from Gem World.

The reasoning in the advertisement would be most strengthened if which one of the following were true?

- (A) Many jewelry stores other than Gem World also provide written certification of the quality of their diamonds.
- (B) The certifications of diamonds at Gem World are written by people with years of experience in appraising gems.
- (C) The diamonds sold at Gem World are generally of higher quality than those sold at other jewelry stores.
- (D) The diamond market is so volatile that prices of the most expensive diamonds can change by hundreds of dollars from one day to the next.
- (E) The written certifications of diamonds at Gem World are provided by an independent company of gem specialists.

The stimulus is prefaced by the word "advertisement." One quirk of the GMAT is that most GMAT stimuli preceded by this word contain faulty or deceptive logic. Thus, whenever you see this word prefacing a stimulus, be on the lookout for misleading or flawed reasoning.

The argument is constructed as follows:

Premise: At most jewelry stores, the person assessing the diamond is the person selling it.

Premise/Sub-conclusion: So you can see why an assessor might say that a diamond is of higher quality than it really is.

Premise: All diamonds sold at Gem World are certified in writing.

Conclusion: You're assured of a fair price when purchasing a diamond from Gem World.

Remember, a conclusion that is then used as a premise to support another conclusion is called a Sub-conclusion.

The first sentence contains a premise and conclusion that relies on the assumption that financial motivation might cause a person to lie about the quality of the item. According to the advertisement, at Gem World there is no such worry because the diamonds are certified in writing. Think for a moment—does that reasoning sound bulletproof? If you were standing there in the store and you were told that Gem World has written certification, wouldn't you ask *who* does the certification? This is the essence of personalizing the argument—place yourself inside the situation and think how you would react. As soon as you do that in this question, the weakness in the argument becomes apparent. Then, since this is a Strengthen question, you can look for an answer choice that eliminates this weakness. Answer choice (E) addresses the hole in the argument by indicating that the individuals who provide the written certification are not the same people who are selling the diamonds at Gem World.

There are other errors in the stimulus, such as assuming that a written certification equals a fair price. The certification may have no impact on the actual price of the diamond, or perhaps it could even be used to raise the price unjustly. These problems are ignored by the answer choices, and the test makers have that right.

Answer choice (A): The conclusion addresses the fair price of diamonds *at Gem World*, not other stores. Hence, the fact that other stores have written certification does not help the Gem World advertisement.

Answer choice (B): This is an answer many people keep as a Contender. The answer is incorrect because it fails to address the point raised in the first sentence, namely that the person assessing the diamond has a personal stake in the outcome. This “accountability” issue is the central point of the argument, and without knowing the source of the certifications, this answer does not strengthen the argument.

Answer choice (C): The argument asserts that a fair price is assured when purchasing a diamond at Gem World. No claim to comparative quality is made in the advertisement, and thus this answer does not strengthen the argument.

Answer choice (D): If anything, this answer may hurt the argument since it indicates that a fair price may not be obtainable at Gem World due to price volatility. If prices change daily, then Gem World may be selling diamonds at a price that does not reflect current market value. However, the answer choice specifically mentions “the most expensive diamonds” and there is no guarantee that Gem World carries diamonds in this price range. So, at best, the answer choice has no effect on the argument and is therefore incorrect.

Answer choice (E): This is the correct answer. As mentioned above, this answer addresses the separation of the certification writer from the seller and thereby strengthens the reasoning.

One thing that makes the GMAT difficult is that the test makers have so many options for testing you. In this question they could have chosen to strengthen a different part of the argument.

Please take a moment to complete the following problem:

2. Statistician: A financial magazine claimed that its survey of its subscribers showed that North Americans are more concerned about their personal finances than about politics. One question was: "Which do you think about more: politics or the joy of earning money?" This question is clearly biased. Also, the readers of the magazine are a self-selecting sample. Thus, there is reason to be skeptical about the conclusion drawn in the magazine's survey.

Each of the following, if true, would strengthen the statistician's argument EXCEPT:

- (A) The credibility of the magazine has been called into question on a number of occasions.
- (B) The conclusions drawn in most magazine surveys have eventually been disproved.
- (C) Other surveys suggest that North Americans are just as concerned about politics as they are about finances.
- (D) There is reason to be skeptical about the results of surveys that are biased and unrepresentative.
- (E) Other surveys suggest that North Americans are concerned not only with politics and finances, but also with social issues.

This problem is more difficult than the previous problem, in part because this is an Except question. As you recall, in a Strengthen Except question the four incorrect answers strengthen the argument and the correct answer either has no effect on the argument or weakens the argument.

The statistician's statement begins with a variation of the classic GMAT construction "Some people claim..." As discussed in Chapter Two, when this construction is used, the author almost always argues against the claim made by the people. Here, a financial magazine has claimed that a survey proves that North Americans are more concerned about personal finances than politics. The statistician attacks two elements of the survey—there was a biased question and the sampling was faulty—and concludes the magazine's claim is questionable. Let us take a closer look at the statistician's two premises:

1. One question was biased.

The key to understanding this claim is the phrasing of the question in the magazine: "the joy of earning money." By describing politics neutrally but describing earning money as a fun activity, the question inappropriately suggests to the magazine reader that one activity is more

interesting than the other. This bias undermines the integrity of the survey.

2. The sample was self-selecting.

A self-selecting sample is one in which individuals decide whether to participate. As you might expect, only those interested in the topic tend to participate and this creates a bias in the results. Because the survey was of subscribers to a financial magazine and not of the general North American population, those participating in the sample are not necessarily representative of North Americans and thus the magazine cannot reliably draw a conclusion about North Americans.

As mentioned previously, surveys that are conducted properly are considered reliable by the makers of the GMAT.

Hence, the statistician's position appears reasonably strong. Nonetheless, you are asked to eliminate four answers that will strengthen it further.

Earlier in this chapter we mentioned that the test makers believe in the validity of surveys, polls, etc. This question does not affect that position; in this situation the survey itself is the topic of discussion. Normally, that is not the case, and unless a survey or poll is shown to be questionable, you can typically accept the results knowing that the test makers believe survey results are valid.

Answer choice (A): This answer asserts that the magazine has credibility issues and thereby supports the conclusion that there should be skepticism regarding the magazine's activities.

Answer choice (B): This answer attacks the integrity of magazine surveys, and therefore supports the idea that there is reason to be skeptical of this magazine survey. Frankly, this is a weak answer because the validity of surveys in other magazines do not necessarily reflect on the validity of this magazine's survey. Nonetheless, only about five percent of test takers select this answer, as most people are able to recognize the intent of the test makers.

Answer choice (C): This answer supports the argument because other surveys suggest that North Americans are not more concerned about finances than politics. Because this counters the claim of the magazine, the answer supports the statistician's conclusion that there is reason to be skeptical of the magazine's survey.

Answer choice (D): Because the statistician has shown the survey to be biased and unrepresentative, this answer choice supports the statistician's conclusion.

Answer choice (E): This is the correct answer. The answer has no impact on the statistician's argument because a third topic—social issues—was not part of the magazine's survey, nor does this answer suggest anything about the preference of North Americans for finance or politics. Because the answer has no impact, it is correct in a StrengthenX question.

Causality and Strengthen Questions

Because Strengthen and Weaken questions require you to perform opposite tasks, to strengthen a causal conclusion you take the exact opposite approach that you would in a Weaken question.

In Strengthen questions, supporting a cause and effect relationship almost always consists of performing one of the following tasks:

A. Eliminate any alternate causes for the stated effect

Because the author believes there is only one cause (the stated cause in the argument), eliminating other possible causes strengthens the conclusion.

B. Show that when the cause occurs, the effect occurs

Because the author believes that the cause always produces the effect, any scenario where the cause occurs and the effect follows lends credibility to the conclusion. This type of answer can appear in the form of an example.

C. Show that when the cause does not occur, the effect does not occur

Using the reasoning in the previous point, any scenario where the cause does not occur and the effect does not occur supports the conclusion. This type of answer also can appear in the form of an example.

D. Eliminate the possibility that the stated relationship is reversed

Because the author believes that the cause and effect relationship is correctly stated, eliminating the possibility that the relationship is backwards (the claimed effect is actually the cause of the claimed cause) strengthens the conclusion.

E. Show that the data used to make the causal statement are accurate, or eliminate possible problems with the data

If the data used to make a causal statement are in error, then the validity of the causal claim is in question. Any information that eliminates error or reduces the possibility of error will support the argument.

Take a moment to consider each of these items, as they will reappear in the discussion of causality and Assumption questions—the approach will be identical for that combination.

Remember, to strengthen a causal argument you must perform tasks that are opposite of those that weaken a causal argument.

Please take a moment to complete the following problem:

3. Modern navigation systems, which are found in most of today's commercial aircraft, are made with low-power circuitry, which is more susceptible to interference than the vacuum-tube circuitry found in older planes. During landing, navigation systems receive radio signals from the airport to guide the plane to the runway. Recently, one plane with low-power circuitry veered off course during landing, its dials dimming, when a passenger turned on a laptop computer. Clearly, modern aircraft navigation systems are being put at risk by the electronic devices that passengers carry on board, such as cassette players and laptop computers.

Which one of the following, if true, LEAST strengthens the argument above?

- (A) After the laptop computer was turned off, the plane regained course and its navigation instruments and dials returned to normal.
- (B) When in use all electronic devices emit electromagnetic radiation, which is known to interfere with circuitry.
- (C) No problems with navigational equipment or instrument dials have been reported on flights with no passenger-owned electronic devices on board.
- (D) Significant electromagnetic radiation from portable electronic devices can travel up to eight meters, and some passenger seats on modern aircraft are located within four meters of the navigation systems.
- (E) Planes were first equipped with low-power circuitry at about the same time portable electronic devices became popular.

The conclusion of the argument is based on the causal assumption that electronic devices cause a disturbance in low-power circuitry, creating an obvious danger:

ED = electronic devices

I = interference with low-power circuitry

C

E

ED $\longrightarrow$ I

The "Least equals Except" principle applies only when the terms appear in the question stem.

The question stem is a StrengthenX (remember, *Least* works like *Except* in question stems) and thus the four incorrect answers will each strengthen the argument. As you attack the answer choices, look for the five causal strengthening answer types discussed earlier.

Answer choice (A): This answer choice strengthens the argument by showing that when the cause is absent, the effect does not occur (Type C). Once the laptop was turned off, the cause disappeared, and according to the author's beliefs, the effect should then disappear as well.

Answer choice (B): This answer strengthens the argument by showing that the data used to make the conclusion are accurate (Type E). By stating that *all* electronic devices emit radiation, the answer choice closes a hole in the argument.

Answer choice (C): This answer choice strengthens the argument by showing that when the cause is absent, the effect does not occur (Type C).

Answer choice (D): This answer strengthens the argument by showing that the data used to make the conclusion are accurate (Type E). By showing that radiation can travel far enough to reach the cockpit, the cause is confirmed as possible.

Answer choice (E): This is the correct answer. The fact that the circuitry and electronic devices became popular at the same time does not offer any supporting evidence to the contention that the electronic devices cause the interference with the low power circuitry. This answer has no effect on the argument and is therefore correct.

This is the third Strengthen question in a row with (E) as the correct answer choice. This is not a pattern, just an incidental and meaningless result of the questions selected for this section.

Please take a moment to complete the following problem:

4. Amphibian populations are declining in numbers worldwide. Not coincidentally, the earth's ozone layer has been continuously depleted throughout the last 50 years. Atmospheric ozone blocks UV-B, a type of ultraviolet radiation that is continuously produced by the sun, and which can damage genes. Because amphibians lack hair, hide, or feathers to shield them, they are particularly vulnerable to UV-B radiation. In addition, their gelatinous eggs lack the protection of leathery or hard shells. Thus, the primary cause of the declining amphibian population is the depletion of the ozone layer.

Each of the following, if true, would strengthen the argument EXCEPT:

- (A) Of the various types of radiation blocked by atmospheric ozone, UV-B is the only type that can damage genes.
- (B) Amphibian populations are declining far more rapidly than are the populations of nonamphibian species whose tissues and eggs have more natural protection from UV-B.
- (C) Atmospheric ozone has been significantly depleted above all the areas of the world in which amphibian populations are declining.
- (D) The natural habitat of amphibians has not become smaller over the past century.
- (E) Amphibian populations have declined continuously for the last 50 years.

This question is much more difficult than the previous question, in part because one of the wrong answer choices is very attractive.

The conclusion of the argument is a causal statement that the depletion of the ozone layer is the primary cause of the declining amphibian population:

DO = depletion of the ozone layer
DA = decline of amphibian population

C E

DO → DA

This conclusion is based on the fact that the ozone layer blocks harmful UV-B radiation, which amphibians are vulnerable to in both adult and egg form.

Although the argument mentions UV-B radiation, which may sound impressive, the structure of the reasoning is easy to follow and no knowledge of the radiation is needed. The conclusion is clearly stated and easy to spot due to the indicator “thus.” The question stem is a StrengthenX and therefore the four incorrect answers will each strengthen the argument. As with the previous question, look for answers that fit the five causal strengthening answer types discussed earlier.

Answer choice (A): This is the correct answer. The answer fails to shed any light—positive or negative—on the connection between the ozone depletion and the amphibian population decline. Because the argument is concerned with the damage done by UV-B radiation, the fact that UV-B is the only damaging type of radiation blocked by ozone is irrelevant.

Answer choice (B): This answer choice strengthens the argument by showing that when the cause is absent in nonamphibian populations, the effect does not occur (Type C).

Answer choice (C): This answer strengthens the argument by showing that the areas of ozone depletion and amphibian decline match each other, thereby affirming the data used to make the conclusion (Type E).

Answer choice (D): This was the answer most frequently chosen by test takers. This answer choice strengthens the argument by eliminating an alternate cause for the effect (Type A). Had the natural habitat become smaller over the years (from say, human encroachment or climatic change) then that shrinkage would have offered an alternate explanation for the decline in the amphibian population. By eliminating the possibility of habitat shrinkage, the stated cause in the argument is strengthened.

Answer choice (E): This answer strengthens the argument by showing that the decline of the amphibians has mirrored the decline of the ozone layer, thereby affirming the data used to make the conclusion (Type E).

Strengthen Question Type Review

Strengthen questions ask you to identify the answer choice that best supports the argument.

Use the following points to effectively strengthen arguments:

1. Identify the conclusion—this is what you are trying to strengthen!
2. Personalize the argument.
3. Look for weaknesses or holes in the argument.

The same type of wrong answer traps appear in Strengthen as in Weaken questions:

1. Opposite Answers.
2. Shell Game Answers.
3. Out of Scope Answers.

In Strengthen questions, supporting a cause and effect relationship almost always consists of performing one of the following tasks:

- A. Eliminate any alternate causes for the stated effect
- B. Show that when the cause occurs, the effect occurs
- C. Show that when the cause does not occur, the effect does not occur
- D. Eliminate the possibility that the stated relationship is reversed
- E. Show that the data used to make the causal statement is accurate, or eliminate possible problems with the data

Although you do not need to memorize the types of wrong answer choices that appear in Strengthen questions, you must memorize the ways to strengthen a causal argument.

Strengthen Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 168*

1. According to the theory of continental drift, in prehistoric times, many of today's separate continents were part of a single huge landmass. As the plates on which this landmass rested began to move, the mass broke apart, and ocean water filled the newly created chasms. It is hypothesized, for example, that South America was once joined on its east coast with what is now the west coast of Africa.

Which one of the following discoveries, if it were made, would most support the above hypothesis about South America and Africa?

- (A) A large band of ancient rock of a rare type along the east coast of South America is of the same type as a band on the west coast of Africa.
- (B) Many people today living in Brazil are genetically quite similar to many western Africans.
- (C) The climates of western Africa and of the east coast of South America resemble each other.
- (D) Some of the oldest tribes of people living in eastern South America speak languages linguistically similar to various languages spoken by certain western African peoples.
- (E) Several species of plants found in western Africa closely resemble plants growing in South America.

2. Medical doctor: Sleep deprivation is the cause of many social ills, ranging from irritability to potentially dangerous instances of impaired decision making. Most people today suffer from sleep deprivation to some degree. Therefore we should restructure the workday to allow people flexibility in scheduling their work hours.

Which one of the following, if true, would most strengthen the medical doctor's argument?

- (A) The primary cause of sleep deprivation is overwork.
- (B) Employees would get more sleep if they had greater latitude in scheduling their work hours.
- (C) Individuals vary widely in the amount of sleep they require.
- (D) More people would suffer from sleep deprivation today than did in the past if the average number of hours worked per week had not decreased.
- (E) The extent of one's sleep deprivation is proportional to the length of one's workday.

Strengthen Question Problem Set

3. Toxicologist: A survey of oil-refinery workers who work with MBTE, an ingredient currently used in some smog-reducing gasolines, found an alarming incidence of complaints about headaches, fatigue, and shortness of breath. Since gasoline containing MBTE will soon be widely used, we can expect an increased incidence of headaches, fatigue, and shortness of breath.

Each of the following, if true, strengthens the toxicologist's argument EXCEPT:

- (A) Most oil-refinery workers who do not work with MBTE do not have serious health problems involving headaches, fatigue, and shortness of breath.
- (B) Headaches, fatigue, and shortness of breath are among the symptoms of several medical conditions that are potentially serious threats to public health.
- (C) Since the time when gasoline containing MBTE was first introduced in a few metropolitan areas, those areas reported an increase in the number of complaints about headaches, fatigue, and shortness of breath.
- (D) Regions in which only gasoline containing MBTE is used have a much greater incidence of headaches, fatigue, and shortness of breath than do similar regions in which only MBTE-free gasoline is used.
- (E) The oil-refinery workers surveyed were carefully selected to be representative of the broader population in their medical histories prior to exposure to MBTE, as well as in other relevant respects.

4. Galanin is a protein found in the brain. In an experiment, rats that consistently chose to eat fatty foods when offered a choice between lean and fatty foods were found to have significantly higher concentrations of galanin in their brains than did rats that consistently chose lean over fatty foods. These facts strongly support the conclusion that galanin causes rats to crave fatty foods.

Which one of the following, if true, most supports the argument?

- (A) The craving for fatty foods does not invariably result in a rat's choosing those foods over lean foods.
- (B) The brains of the rats that consistently chose to eat fatty foods did not contain significantly more fat than did the brains of rats that consistently chose lean foods.
- (C) The chemical components of galanin are present in both fatty foods and lean foods.
- (D) The rats that preferred fatty foods had the higher concentrations of galanin in their brains before they were offered fatty foods.
- (E) Rats that metabolize fat less efficiently than do other rats develop high concentrations of galanin in their brains.

Strengthen Problem Set Answer Key

Question #1. Strengthen. The correct answer choice is (A)

The theory discussed in the stimulus is a real scientific hypothesis, often called the “Pangaea Theory.” Alfred Wegener, who has been the subject of other GMAT questions, theorized in 1915 that Pangaea was a “supercontinent” composed of all landmasses. The theory is attractive because when the shape of today’s continents is examined, the continents roughly fit together.

The question stem specifically asks you to strengthen the hypothesis that South America and Africa were once joined. To do so, you must identify evidence about the landmasses, as this is the evidence that the hypothesis in the stimulus relies upon.

Answer choice (A): This is the correct answer, and this is the only answer that addresses the land. By tying the rock strata of each continent together, the answer supports the idea that there was once a physical connection between the two continents. A high percentage of test takers correctly identify this answer.

Answer choice (B): This answer addresses people, not land. As with the earlier turtle question, the genetic similarity could be the result of humans from different areas sharing a large amount of DNA.

Answer choice (C): The similarity of climates does not help establish that the landmasses were once connected. For example, the similarity could be the result of both continents largely straddling the equator.

Answer choice (D): The language of the people does not mean the continents were connected. Australians and Americans share the same language, but this is because both areas were populated in modern times by English-speaking people from Britain.

Answer choice (E): The resemblance of plants in both areas does not suggest or strengthen the idea that the continents were joined. Plant similarities could be the result of climate, or perhaps of man-made propagation efforts.

Strengthen Problem Set Answer Key

Question #2. Strengthen. The correct answer choice is (B)

Following is the structure of the medical doctor's argument:

- Premise: Sleep deprivation is the cause of many social ills, ranging from irritability to potentially dangerous instances of impaired decision making.
- Premise: Most people today suffer from sleep deprivation to some degree.
- Conclusion: Therefore we should restructure the workday to allow people flexibility in scheduling their work hours.

The first premise contains a causal assertion (not a causal conclusion), and the second premise indicates that most people suffer from the stated cause. This combination would lead to the conclusion that most people have a social ill (which could be irritability or impaired decision making, or something in between). However, the conclusion in the argument leaps over this idea to conclude that the workday should be restructured. The missing link—or assumption—in the argument is that restructuring the workday would alleviate the sleep deprivation. As always, whenever you see a gap in the argument, you can strengthen the argument by eliminating that gap. By relating sleep to work, answer choice (B) closes the gap in the argument.

Answer choice (A): This is a tricky answer, and the key word is “overwork.” While the author clearly believes that work schedules affect sleep, this does not mean that employees are being overworked. For example, a person may be sleep deprived because they have to come into work at 8 A.M. Perhaps they have children so they must get up very early to take care of their family. The person might then work a normal eight hour day and be sleep deprived not because of overwork but because of rising early.

Answer choice (B): This is the correct answer. By indicating that employees would avoid sleep deprivation with a revised workday, this answer affirms that the leap made in the argument is not an unreasonable one.

Answer choice (C): This answer may hurt the argument by suggesting that some individuals cannot be helped by the restructuring of the workday. At best, this answer has no impact on the argument because we already know that most people suffer from sleep deprivation to some degree.

Answer choice (D): This answer addresses the fact that the hours worked per week has decreased. But the argument is not about the average number of hours worked, but rather the way that those hours affect sleep. Thus, this answer does not help the conclusion that people should be allowed flexibility in scheduling.

Answer choice (E): The argument does not suggest that the workday will be shortened, only that the day will be structured so that people have more flexibility in scheduling their hours. Thus, knowing that the extent of sleep deprivation is proportional to the length of one's workday does not strengthen the argument.

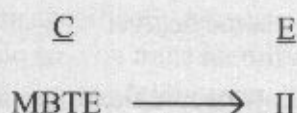
Strengthen Problem Set Answer Key

Question #3. StrengthenX-CE. The correct answer choice is (B)

The conclusion of the argument reflects a causal relationship:

MBTE = MBTE used

II = increased incidence of headaches, fatigue, and shortness of breath



The question stem is a StrengthenX, and therefore the four wrong answers will support the argument. With a stimulus containing causal reasoning and a StrengthenX question, expect to see wrong answers that come from the five different “Causality and Strengthen Questions” categories to help the argument.

Answer choice (A): This answer shows that when the cause is not present, then the effect is not present. Thus, the answer strengthens the argument and is incorrect.

Answer choice (B): This is the correct answer. By indicating that the symptoms discussed in the stimulus can be the effects of several potentially serious public health threats, the author offers up possible alternate causes for the symptoms. These alternate causes would weaken the argument, and therefore this is the correct answer.

Answer choice (C): This answer affirms that when the cause occurs, then the effect occurs. The answer therefore strengthens the argument.

Answer choice (D): Like answer choice (C), this answer shows that when the cause is present, then the effect is present, and makes the case stronger by comparing that scenario to regions where the cause is absent, and the effect is not as pronounced as when the cause is present.”

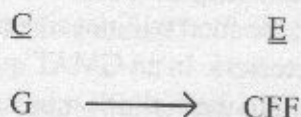
Answer choice (E): This answer choice strengthens the argument by showing that the data used to make the argument are accurate.

Strengthen Problem Set Answer Key

Question #4. Strengthen-CE. The correct answer choice is (D)

This stimulus also contains causal reasoning—the conclusion takes a correlation and turns it into a causal relationship:

G = higher concentration of galanin in the brain
CFF = crave fatty foods



As with all causal arguments, once you identify the causality, you must immediately look to the question stem and then attack. In this instance, the author simply assumes that galanin is the cause. Why can't the fatty foods lead to higher concentrations of galanin?

Answer choice (A): If anything, this answer choice may hurt the argument by showing that the cravings do not always lead to choosing fatty foods. But, since the author uses the phrase “consistently chose” to describe the choices of the rats, an answer stating that rats did not “invariably” choose fatty foods has no effect on the argument.

Answer choice (B): This is a Shell Game answer because the test makers try to get you to fall for an answer that addresses the wrong issue. The argument discusses the concentration of galanin in the brains of rats; no mention is made of the fat content of the brains of rats. This answer, which focuses on the fat content in the brains of rats, therefore offers no support to the argument. Even though the brain might not contain more fat, a rat could still consistently choose and eat foods with a higher fat content.

Answer choice (C): The argument is that galanin *in the brain* causes rats to crave fatty foods. The fact that galanin is in the food does not help that assertion and may actually hurt the argument.

Answer choice (D): This is the correct answer. The answer strengthens the argument by eliminating the possibility that the stated causal relationship is reversed: if the rats had higher concentrations of galanin prior to eating the fatty foods, then the fatty foods cannot be the cause of the higher concentration of galanin. As discussed earlier in the chapter, this approach strengthens the argument by making it more likely that the author had the original relationship correct.

Answer choice (E): This answer choice hurts the argument by suggesting that the causal relationship in the conclusion is reversed. Remember that in Strengthen questions you can expect to see Opposite answers, and this is one.

Assumption Questions

An argument can be analogized to a house: the premises are like walls, the conclusion is like the roof, and the assumptions are like the foundation.

As with a house foundation, an assumption is a hidden part of the structure, but critical to the integrity of the structure—all the other elements rest upon it.

The correct answer to an Assumption question is a statement the author must believe in order for the conclusion to make sense.

For many students, Assumption questions are the most difficult type of Critical Reasoning problem. An assumption is simply an unstated premise of the argument; that is, an integral component of the argument that the author takes for granted and leaves unsaid. In our daily lives we make thousands of assumptions, but they make sense because they have context and we have experience with the way the world works. Think for a moment about the many assumptions required during the simple act of ordering a meal at a restaurant. You assume that: the prices on the menu are correct; the items on the menu are available; the description of the food is reasonably accurate; the waiter will understand what you say when you order; the food will not sicken or kill you; the restaurant will accept your payment, etcetera. In an GMAT question, you are faced with the difficult task of figuring out the author's mindset and determining what assumption he or she made when formulating the argument. This task is unlike any other on the GMAT.

Because an assumption is an integral component of the author's argument, a piece that must be true in order for the conclusion to be true, assumptions are *necessary* for the conclusion. Hence, the answer you select as correct must contain a statement that the author relies upon and is fully committed to in the argument. Think of an assumption as the foundation of the argument, a statement that the premises and conclusion rest upon. If an answer choice contains a statement that the author might only think *could* be true, or if the statement contains additional information that the author is not committed to, then the answer is incorrect. In many respects, an assumption can be considered a minimalist answer. Because the statement must be something the author believed when forming the argument, assumption answer choices cannot contain extraneous information. For example, let us say that an argument requires the assumption "all dogs are intelligent." The correct answer could be that statement, or even a subset statement such as "all black dogs are intelligent" or "all large dogs are intelligent" (black dogs and large dogs being subsets of the overall group of dogs, of course). But, additional information would rule out the answer, as in the following case: "All dogs and cats are intelligent." The additional information about cats is not part of the author's assumption, and would make the answer choice incorrect.

Because assumptions are described as what must be true in order for the conclusion to be true, some students ask about the difference between Must Be True question answers and Assumption question answers. The difference is one that can be described as *before* versus *after*. Assumption answers contain statements that were *used to make* the conclusion; Must Be True answers contain statements that *follow from* the argument made in the stimulus. In both cases, however, there is a stringent requirement that must be met: Must Be True answers must be proven by the information in the stimulus; Assumption answers contain statements the author must believe in order for the conclusion to be valid.

Question stem examples:

“The argument in the passage depends on which of the following assumptions?”

“The argument above assumes that”

“The conclusion above is based on which of the following assumptions?”

“Which of the following is an assumption made in drawing the conclusion above?”

“The conclusion of the argument above cannot be true unless which of the following is true”

The Supporter/Defender Assumption Model™

Most GMAT publications and courses present a limited description of assumptions. An assumption is described solely as a linking statement, one that links two premises or links a premise to the conclusion. If no other description of assumptions is given, this limited presentation cheats students of the possibility of fully understanding the way assumptions work within arguments and the way they are tested by the makers of the exam.

On the GMAT, assumptions play one of two roles—the Supporter or the Defender. The Supporter role is the traditional linking role, where an assumption connects the pieces of the argument. Consider the following example:

All male citizens of Athens had the right to vote. Therefore, Socrates had the right to vote in Athens.

The linking assumption is that Socrates was a male citizen of Athens. This connects the premise element of male citizens having the right to vote and the conclusion element that Socrates had the right to vote (affiliated assumptions are “Socrates was male” and “Socrates was a citizen of Athens”).

Supporters often connect “new” or “rogue” pieces of information in the argument, and we typically use the term “new” or “rogue” to refer to an element that appears only in the conclusion or only in a premise. Thus, the conclusion in a Supporter argument often contains a piece of information not previously seen in the argument. In the example above, for instance, “Socrates” is a new element in the conclusion. These “new” elements create gaps in the argument, and Supporter assumptions on the GMAT are often relatively easy for students to identify because they can see the gap in the argument. The Supporter assumption, by definition, closes the hole by linking the elements together. Should you ever see a gap or a new element in the conclusion, a Supporter assumption answer will almost certainly close the gap or link the new element back to the premises.

The Defender role is entirely different, and Defender assumptions protect the argument by eliminating ideas that could weaken the argument. Consider our discussion from Chapter Two:

“When you read an GMAT argument from the perspective of the author, keep in mind that he or she believes that their argument is sound. In other words, they do not knowingly make errors of reasoning. This is a fascinating point because it means that GMAT authors, as part of the GMAT world, function as if the points they raise and the conclusions they make have been well-considered and are airtight.”

If you see a weakness in the argument, look for an answer that eliminates the weakness or assumes that it does not exist. In other words, close the gaps in the argument.

This fundamental truth of the GMAT has a dramatic impact when you consider the range of assumptions that must be made by an GMAT author. In order to believe the argument is “well-considered and airtight,” an author must assume that every possible objection has been considered and rejected. Consider the following causal argument:

People who read a lot are more intelligent than other people. Thus, reading must cause a person to be intelligent.

Although the conclusion is questionable (for example, the situation may be reversed: intelligence might be the cause of reading a lot), in the author’s mind *all* other alternative explanations are assumed not to exist. Literally, the author assumes that any idea that would weaken the argument is impossible and cannot occur. Consider some of the statements that would attack the conclusion above:

Sleeping more than eight hours causes a person to be intelligent.

Regular exercise causes a person to be intelligent.

A high-protein diet causes a person to be intelligent.

Genetics cause a person to be intelligent.

Each of these ideas would undermine the conclusion, but they are assumed by the author *not* to be possible, and the author therefore makes the following assumptions in the original argument:

Sleeping more than eight hours does not cause a person to be intelligent.

Regular exercise does not cause a person to be intelligent.

A high-protein diet does not cause a person to be intelligent.

Genetics do not cause a person to be intelligent.

These assumptions protect the argument against statements that would undermine the conclusion. In this sense, they “defend” the argument by showing that a possible avenue of attack has been eliminated (assumed not to exist). As you can see, this list could go on and on because the author assumes every alternate cause does not exist. This means that although the argument only discussed reading and intelligence, we suddenly find ourselves with assumptions addressing a wide variety of topics that were never discussed in the stimulus. In a typical argument, there are an infinite number of assumptions possible, with most of those coming on the Defender side. Books and courses that focus solely on the Supporter role miss these assumptions, and students who do not understand how Defenders work will often summarily dismiss answer choices that later prove to be correct.

Supporter answer choices lend themselves well to prephrasing. Defender answers do not because there are too many possibilities to choose from.

By assuming that any threat to the argument does not exist, the author can present the argument and claim it is valid. If the author knew of imperfections and still presented the argument without a caveat, then the author would be hard-pressed to claim that this conclusion—especially an absolute one—was reasonable.

If there is no obvious weakness in the argument and you are faced with an Assumption question, expect to see a Defender answer choice.

Let's review the two roles played by assumptions:

- Supporter Assumption:** These assumptions link together new or rogue elements in the stimulus or fill logical gaps in the argument.
- Defender Assumption:** These assumptions contain statements that eliminate ideas or assertions that would undermine the conclusion. In this sense, they "defend" the argument by showing that a possible source of attack has been eliminated.

Let us examine examples of each type. Please take a moment to complete the following question:

1. Art historian: Great works of art have often elicited outrage when first presented; in Europe, Stravinsky's *Rite of Spring* prompted a riot, and Manet's *Déjeuner sur l'herbe* elicited outrage and derision. So, since it is clear that art is often shocking, we should not hesitate to use public funds to support works of art that many people find shocking.

Which one of the following is an assumption that the art historian's argument requires in order for its conclusion to be properly drawn?

- (A) Most art is shocking.
- (B) Stravinsky and Manet received public funding for their art.
- (C) Art used to be more shocking than it currently is.
- (D) Public funds should support art.
- (E) Anything that shocks is art.

Once you understand the way Supporters work, they can often be predicted after you read an argument.

This is a very challenging Supporter assumption, and only about half of the test takers identify the correct answer. Take a close look at the conclusion: "we should not hesitate to use public funds to support works of art that many people find shocking." Did "public funds" appear anywhere else in the argument? No. Given our discussion about linking new elements that appear in the conclusion, you should have recognized that a new element was present and responded accordingly. Given that Supporters connect new elements, one would suspect that the correct answer would include this element and that either answer choice (B) or (D) was correct. Take a look at the argument structure:

Premise: Great works of art have often elicited outrage when first presented; in Europe, Stravinsky's *Rite of Spring* prompted a riot, and Manet's *Déjeuner sur l'herbe* elicited outrage and derision.

Premise: Art is often shocking.

Conclusion: We should not hesitate to use public funds to support works of art that many people find shocking.

However, because the structure of the last sentence in the stimulus ("So, since...") suggests that the author uses the second premise to prove the conclusion, you should focus on the relationship between those two pieces. For the author to say that art is shocking and therefore art should be publicly funded, the author must assume that art is worthy of public support. This assumption is reflected in answer choice (D), the correct answer.

Answer choice (A): The author states that "art is often shocking" but does not assume that *most* art is shocking.

Answer choice (B): This is the most popular wrong answer choice. In the argument, is the author committed to believing that Stravinsky and Manet received public funding? Does the author need this statement in order for the rest of the argument to work? No. The author uses Stravinsky and Manet as examples of artists whose work caused shock, but the author never assumes that those individuals received public funding. Think for a moment—does the conclusion rest on the fact that Stravinsky and Manet received public funding?

Answer choice (C): The author makes no statement regarding the "shock level" of today's art, and thus there is no way to determine if an assumption has been made comparing the shock level of past and present art.

Answer choice (D): This is the correct answer. The answer acts as a Supporter and connects the elements in the final sentence.

Answer choice (E): The author states that "art is often shocking," but there is no indication that a conditional assumption has been made stating that anything that shocks is art.

As is often the case with GMAT stimuli, the argument is based on real events. During the notorious 1913 premiere of the ballet *Rite of Spring*, the rioting crowd inside and outside the theater was so loud the pit orchestra director had difficulty conducting.

Now let us look at a Defender assumption. Please take a moment to complete the following question:

2. In Western economies, more energy is used to operate buildings than to operate transportation. Much of the decline in energy consumption since the oil crisis of 1973 is due to more efficient use of energy in homes and offices. New building technologies, which make lighting, heating, and ventilation systems more efficient, have cut billions of dollars from energy bills in the West. Since energy savings from these efficiencies save several billion dollars per year today, we can conclude that 50 to 100 years from now they will save more than \$200 billion per year (calculated in current dollars).

On which one of the following assumptions does the argument rely?

- (A) Technology used to make buildings energy efficient will not become prohibitively expensive over the next century.
- (B) Another oil crisis will occur in the next 50 to 100 years.
- (C) Buildings will gradually become a less important consumer of energy than transportation.
- (D) Energy bills in the West will be \$200 billion lower in the next 50 to 100 years.
- (E) Energy-efficient technologies based on new scientific principles will be introduced in the next 50 to 100 years.

Unlike Supporter assumptions, Defender assumptions are extremely hard to prephrase because there are so many possibilities for the test makers to choose from. The correct answer in this problem is a Defender, but it is unlikely that anyone could have predicted the answer. Compare this to the previous problem, where many students were able to prephrase the correct Supporter answer.

Now, focus on the final sentence of the argument, which contains a premise and conclusion:

Premise: Energy savings from these efficiencies [new building technologies] save several billion dollars per year today.

Conclusion: 50 to 100 years from now they will save more than \$200 billion per year (calculated in current dollars).

So, according to the author, the new building technologies—which are already saving billions—will continue to do the same in the future and the savings will be even greater, relatively.

Answer choice (A): This is the correct answer, and a classic Defender. If the money-saving and energy-saving technology becomes too expensive to use in the next 100 years, the savings expected will not materialize. Because this idea would clearly weaken the argument, the author assumes that it does not exist, and answer choice (A) denies that the technology will become prohibitively expensive over the next century.

Answer choice (B): Although there has been an energy usage decline since the 1973 oil crisis, the author does not assume that there will be another crisis in the next 50 to 100 years. Look at the conclusion—does there seem to be a reliance on the idea in this answer? No.

Answer choice (C): Although this answer plays with the idea mentioned in the first sentence of the stimulus—that more energy is used to operate buildings than to operate transportation—no assumption is made that buildings will become a less important consumer of energy. True, buildings have saved billions in operating in costs, but the conclusion is about future savings and not about comparing buildings to transportation.

Answer choice (D): The argument is specific about technologies *saving* more than \$200 billion per year; the author does not assume that the *total* bill in the next 50 to 100 years will be lower by \$200 billion.

Answer choice (E): The argument is about current technologies saving money in the future. The author does not make an assumption regarding new technologies being introduced in the future.

The Assumption Negation Technique™

Only a few types of GMAT questions allow you to double-check your answer. Assumption questions are one of those types, and you should use the Assumption Negation Technique to decide between Contenders or to confirm that the answer you have chosen is correct.

The purpose of this technique is to take an Assumption question, which is generally difficult for most students, and turn it into a Weaken question, which is easier for most students. *This technique can only be used on Assumption questions.* To apply the technique take the following steps:

1. Logically negate the answer choices under consideration.

We will discuss negation later in this section, but negating a statement means to alter the sentence so the meaning is logically opposite of what was originally stated. Negation largely consists of taking a “not” out of a sentence when one is present, or putting a “not” in a sentence if one is not present. For example, “The congressman always votes for gun control” becomes “The congressman does not always vote for gun control” when properly negated.

2. The negated answer choice that attacks the argument will be the correct answer.

When the correct answer choice is negated, the answer *must* weaken the argument. This will occur because of the *necessary* nature of an assumption.

The consequence of negating an assumption is that the validity of the conclusion is called into question. In other words, when you take away (negate) an assumption—a building block of the argument—it calls into question the integrity of the entire reasoning structure. Accordingly, negating the answer choices turns an Assumption question into a Weaken question.

Do not use the Assumption Negation Technique on all five answer choices. The process is too time-consuming and you can usually knock out a few answer choices without working too hard. Only apply the technique once you have narrowed the field.

Negating Statements

Negating a statement consists of creating the *logical* opposite of the statement. The logical opposite is the statement that denies the truth of the original statement, and a logical opposite is different than the *polar* opposite. For example, consider the following statement:

I went to the beach every day last week.

The logical opposite is the statement requiring the least amount of “work” to negate the original statement:

I did not go to the beach every day last week.

The polar opposite typically goes much further:

I did not go to the beach *any* day last week.

For GMAT purposes, the logical opposite is the statement you should seek when negating, and in order to do this you must understand logical opposition.

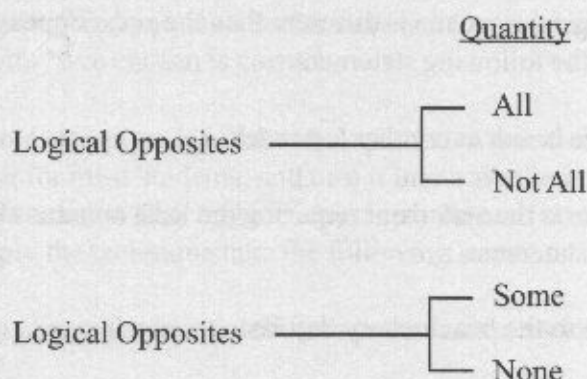
Logical Opposition

The concept of logical opposition appears frequently on the GMAT in a variety of forms. A complete knowledge of the logical opposites that most often appear will provide you with a framework that eliminates uncertainties and ultimately leads to skilled GMAT performance. Consider the following question:

What is the logical opposite of sweet?

Most people reply “sour” to the above question. While “sour” is an opposite of “sweet,” it is considered the polar opposite of “sweet,” not the logical opposite. A logical opposite will always completely divide the subject under consideration into two parts. Sweet and sour fail as logical opposites since tastes such as bland or bitter remain unclassified. The correct logical opposite of “sweet” is in fact “not sweet.” “Sweet” and “not sweet” divide the taste spectrum into two complete parts, and tastes such as bland and bitter now clearly fall into the “not sweet” category. This same type of oppositional reasoning also applies to other everyday subjects such as color (what is the logical opposite of white?) and temperature (what is the logical opposite of hot?).

To help visualize pairs of opposites within a subject, we use an Opposition Construct. An Opposition Construct efficiently summarizes subjects within a limited spectrum of possibilities, such as quantity:



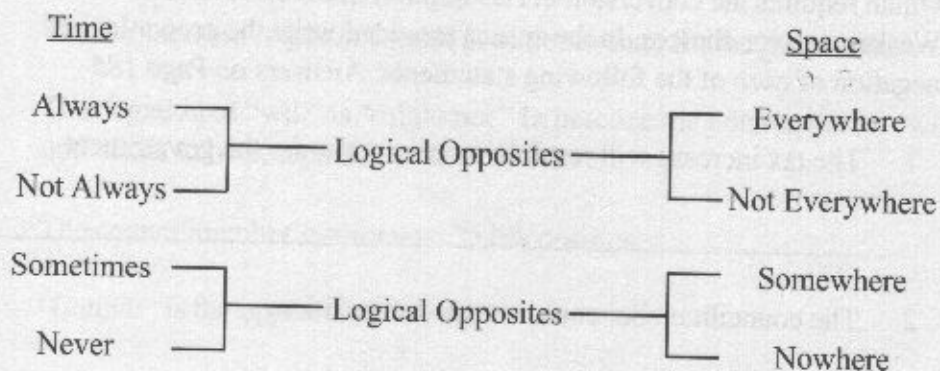
In this quantity construct, the range of possibilities extends from All to None. Thus, these two “ends” are polar opposites. There are also two pairs of logical opposites: All versus Not All and Some versus None. These logical opposites hold in both directions: for example, Some is the precise logical opposite of None, and None is the precise logical opposite of Some. The relationship between the four logical possibilities of quantity becomes more complex when we examine pairs such as Some and All. Imagine for a moment that we have between 0 and 100 marbles. According to the above construct, each logical possibility represents the following:

<u>Quantity</u>		
	All	= 100
	Not All	= 0 to 99 (everything but All)
	Some	= 1 to 100 (everything but None)
	None	= 0

By looking closely at the quantities each possibility represents, we can see that Some (1 to 100) actually includes All (100). This makes sense because Some, if it is to be the exact logical opposite of None, should include every other possibility besides None. The same relationship also holds true for Not All (0 to 99) and None (0).

The relationship between Some and Not All is also interesting. Some (1 to 100) and Not All (0 to 99) are largely the same, but they differ significantly at the extremes. Some actually includes All, the opposite of Not All, and Not All includes None, the opposite of Some. As a point of definition Not All is the same as Some Are Not.

The same line of reasoning applies to other subjects that often appear on the GMAT:



The Time and Space constructs are very similar to the Quantity construct. For example, Always is somewhat equivalent to "All of the time." Everywhere could be said to be "All of the space." Thus, learning one of these constructs makes it easy to learn the other two.

Statement Negation Drill

This drill will test your ability to use the Assumption Negation Technique™, which requires the conversion of Assumption question answer choices to Weaken answer choices. In the spaces provided write the proper logical negation of each of the following statements. *Answers on Page 185*

1. The tax increase will result in more revenue for the government.

2. The councilmember could reverse her position.

3. The voting patterns in this precinct changed significantly in the past year.

4. The pattern of behavior in adolescents is not necessarily determined by the environment they are raised in.

5. Organic farming methods promote crop resistance to pest attack.

6. All of the missions succeeded.

7. The positive effects of the U.S. immigration policy are everywhere.

8. Exactly one police car will reach the scene in time.

Statement Negation Drill Answer Key

The correct answer is listed below, with the negating elements italicized.

1. The tax increase *might not* result in more revenue for the government.

The negation of "will" is "might not." In practice the polar opposite "will not" tends to be acceptable.

2. The councilmember *cannot* reverse her position.

"Cannot" is the opposite of "could."

3. The voting patterns in this precinct *did not* change significantly in the past year.

4. The pattern of behavior in adolescents is *necessarily* determined by the environment they are raised in.

5. Organic farming methods *do not* promote crop resistance to pest attack.

6. *Not all* of the missions succeeded.

7. The positive effects of the U.S immigration policy are *not* everywhere.

Note that "positive" in this sentence does not become "negative." To say "The negative effects of the U.S immigration policy are everywhere" would not negate the original.

8. *Not exactly one* police car will reach the scene in time.

Typically, there are two ways to negate a phrase containing the words "only one" or "exactly one." One possibility is to use the term "none" and the other possibility is to use the phrase "more than once." Both are logical negations since you are attempting to negate a statement where something occurred a precise number of times. In this case, any statement that differs in number from the original statement will be a negation.

Three Quirks of Assumption Question Answer Choices

Over the years, certain recurring traits have appeared in Assumption answer choices. Recognizing these quirks may help you eliminate wrong answers or more quickly identify the correct answer at crunch time.

1. Watch for answers starting with the phrase “at least one” or “at least some.”

For some reason, when an Assumption answer choice starts with either of the above constructions the chances are unusually high that the answer will be correct. However, if you spot an answer with that construction, do not simply assume the answer is correct; instead, use the proper negation (“None”) and check the answer with the Assumption Negation Technique.

2. Avoid answers that claim an idea was the most important consideration for the author.

These answers typically use constructions such as “the primary purpose,” “the top priority,” or “the main factor.” In every Assumption question these answers have been wrong. And, unless, the author specifically discusses the prioritization of ideas in the stimulus, these answers will continue to be wrong because an author can always claim that the idea under discussion was very important but not necessarily the most important idea.

3. Watch for the use of “not” or negatives in assumption answer choices.

Because most students are conditioned to think of assumptions as positive connecting elements, the appearance of a negative in an Assumption answer choice often causes the answer to be classified a Loser. Do not rule out a negative answer choice just because you are used to seeing assumptions as a positive part of the argument. As we have seen with Defender answer choices, one role an assumption can play is to eliminate ideas that could attack the argument. To do so, Defender answer choices frequently contain negative terms such as “no,” “not,” and “never.” One benefit of this negative language is that Defender answer choices can usually be negated quite easily.

In an Assumption question, there can be only one answer that will hurt the argument when negated. If you negate the answers and think that two or more hurt the argument, you have made a mistake.

Assumptions and Causality

The central assumption of causality was stated in the last chapter:

“When an GMAT speaker concludes that one occurrence caused another, that speaker also assumes that the stated cause is the only possible cause of the effect and that the stated cause will always produce the effect.”

Thus, because the author always assumes that the stated cause is the only cause, Assumption answer choices tend to work exactly like Strengthen answer choices in arguments with causal reasoning. The correct answer to an Assumption question will normally fit one of the following categories:

A. Eliminates an alternate cause for the stated effect

Because the author believes there is only one cause (the stated cause in the argument), the author assumes no other cause exists.

B. Shows that when the cause occurs, the effect occurs

Because the author believes that the cause always produces the effect, assumption answers will affirm this relationship.

C. Shows that when the cause does not occur, the effect does not occur

Using the reasoning in the previous point, the author will always assume that when the cause does not occur, the effect will not occur.

D. Eliminates the possibility that the stated relationship is reversed

Because the author believes that the cause-and-effect relationship is correctly stated, the author assumes that the relationship cannot be backwards (the claimed effect is actually the cause of the claimed cause).

E. Shows that the data used to make the causal statement are accurate, or eliminates possible problems with the data

If the data used to make a causal statement are in error, then the validity of the causal claim is in question. The author assumes that this cannot be the case and that the data are accurate.

The above categories should be easy to identify because you should have already memorized them from the Strengthen question section. From now on, when you encounter Assumption questions containing causal reasoning, you will be amazed at how obvious the correct answer will seem. These types of

Increasing your GMAT “speed” is a result of recognizing the patterns and elements that appear within GMAT questions, and then understanding exactly how to respond. The faster you are at recognition-response, the more questions you will complete.

patterns within questions are what make improvement on the GMAT possible, and when you become comfortable with the ideas, your speed will also increase.

Please take a moment to complete the following problem:

3. Doctors in Britain have long suspected that patients who wear tinted eyeglasses are abnormally prone to depression and hypochondria. Psychological tests given there to hospital patients admitted for physical complaints like heart pain and digestive distress confirmed such a relationship. Perhaps people whose relationship to the world is psychologically painful choose such glasses to reduce visual stimulation, which is perceived as irritating. At any rate, it can be concluded that when such glasses are worn, it is because the wearer has a tendency to be depressed or hypochondriacal.

The argument assumes which one of the following?

- (A) Depression is not caused in some cases by an organic condition of the body.
- (B) Wearers do not think of the tinted glasses as a means of distancing themselves from other people.
- (C) Depression can have many causes, including actual conditions about which it is reasonable for anyone to be depressed.
- (D) For hypochondriacs wearing tinted glasses, the glasses serve as a visual signal to others that the wearer's health is delicate.
- (E) The tinting does not dim light to the eye enough to depress the wearer's mood substantially.

The conclusion of this argument is causal in nature ("because" is the indicator):

Depression = tendency to be depressed or hypochondriacal
Glasses = glasses

Glasses = glasses are worn



The answer choices are very interesting as they all relate to either the cause or effect, or both. Answer choices (A) and (C) are similar in that they both discuss what causes depression (the cause of the cause). But the author has made no assumption about what *causes* depression, only that depression causes a person to wear glasses. Therefore, both of these answers are incorrect. Similarly, answer choices (B) and (D) both discuss the effects of wearing glasses (the effects of the effect). Again, this is not a part of the author's argument. Because answer choices (A), (B), (C), and (D) discuss issues that occur either "before" or "after" the causal relationship in the conclusion, they are incorrect.

Answer choice (E): This is the correct answer. Answer choice (E) is a Defender that eliminates the possibility that the stated relationship is reversed (Type D in the Assumptions and Causality discussion). Remember, if the glasses actually cause the wearer to be depressed, this scenario would hurt the argument, so the author assumes the possibility cannot exist. Note how tricky this answer could be, especially if you had not been exposed to the way the test makers think about causality and assumptions. With the right information, the answer can be identified as part of a larger pattern on the GMAT, and this allows you to solve the problem quickly and confidently. While it may take a bit of work to memorize the different assumptions inherent in causal arguments, the payoff is more than worth the effort.

Assumption—Fill in the Blank Questions

A number of GMAT questions contain a stimulus that ends with a blank space. The question stem then asks you to fill in the blank with an appropriate answer. While not one of the most common question types, a Fill in the Blank question can throw off test takers who are surprised by the unusual stimulus formation. No need to worry; on the GMAT these are almost always Assumption questions in disguise (and when they are not Assumption questions they are Must Be True/Main Point questions—more on this in a moment).

The placement of the blank in the stimulus is not random—the blank is always at the very end of the stimulus. There is a premise indicator at the start of the sentence to help you recognize that you are being asked to fill in a missing premise, which is of course the same as an assumption. In order to achieve this goal, you must read the stimulus for clues revealing the direction of the argument and the author's beliefs.

First, here are some sample final sentences drawn from GMAT questions to give you an example of how the sentence with the blank appears:

“...because _____.”

“...is the fact that _____.”

“...is that _____.”

“...since _____.”

As you can see, just prior to the blank is a premise indicator; this is the signal that you must supply an assumption of the argument.

Main Point—Fill in the Blank Questions

Although extremely rare on the GMAT, the test makers can offer up “fill in the blank” questions that ask for a conclusion of the argument. In these instances, the blank would be preceded by a conclusion indicator (as opposed to a premise indicator). In each case, you should fill the blank with the answer choice that best represents the main point of the argument. Just as with the Assumption—Fill in the Blank questions, in order to achieve this goal you must read the stimulus for clues revealing the direction of the argument and the author’s intent.

Here are some sample final stimulus sentences to give you an example of how a Main Point—fill in the Blank question would appear:

“Therefore, _____.”

“Hence, in the new century, the stability of a nation’s cultural identity will likely _____.”

“Thus, in many cases, by criminals’ characterization of their situations, _____.”

As you can see, each sentence above begins with a conclusion indicator that modifies the blank. This is the signal that you must supply the conclusion. Simply look for the answer that best summarizes the point of the author’s argument.

Assumption Question Type Review

An assumption is simply an unstated premise of the argument; that is, an integral component of the argument that the author takes for granted and leaves unsaid.

The answer you select as correct must contain a statement that the author relies upon and is fully committed to in the argument.

On the GMAT, assumptions play one of two roles: the Supporter or the Defender:

Supporter Assumption: These assumptions link together new or rogue elements in the stimulus or fill logical gaps in the argument.

Defender Assumption: These assumptions contain statements that eliminate ideas or assertions that would undermine the conclusion. In this sense, they “defend” the argument by showing that a possible avenue of attack has been eliminated (assumed not to exist).

Use the Assumption Negation Technique to decide between Contenders or to confirm that the answer you have chosen is correct. The purpose of this technique is to take an Assumption question, which is generally more difficult, and turn it into a Weaken question. *This technique can only be used on Assumption questions.* Take the following steps to apply this technique:

1. Logically negate the answer choices under consideration.
2. The negated answer choice that attacks the argument will be the correct answer.

Negating a statement consists of creating the *logical* opposite of the statement. The logical opposite is the statement that denies the truth of the original statement, and the logical opposite is different than the polar opposite.

Assumption answer choices tend to work exactly like Strengthen answer choices in arguments with causal reasoning. Because the author always assumes the stated cause is the only cause, the correct answer to an Assumption question will normally fit one of the following categories:

- A. Eliminates an alternate cause for the stated effect
- B. Shows that when the cause occurs, the effect occurs

- C. Shows that when the cause does not occur, the effect does not occur
- D. Eliminates the possibility that the stated relationship is reversed
- E. Shows that the data used to make the causal statement are accurate, or eliminates possible problems with the data

Fill in the Blank questions are almost always Assumption questions in disguise (and when they are not Assumption questions they are Must Be True/Main Point questions). The placement of the blank is always at the very end of the stimulus. There is a premise indicator at the start of the sentence to help you recognize that you are being asked to fill in a missing premise, which is of course the same as an assumption. In order to achieve this goal, you must read the stimulus for clues revealing the direction of the argument and the author's beliefs.

Assumption Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 196*

1. Barnes: The two newest employees at this company have salaries that are too high for the simple tasks normally assigned to new employees and duties that are too complex for inexperienced workers. Hence, the salaries and the complexity of the duties of these two newest employees should be reduced.

Which one of the following is an assumption on which Barnes's argument depends?

- (A) The duties of the two newest employees are not less complex than any others in the company.
- (B) It is because of the complex duties assigned that the two newest employees are being paid more than is usually paid to newly hired employees.
- (C) The two newest employees are not experienced at their occupations.
- (D) Barnes was not hired at a higher-than-average starting salary.
- (E) The salaries of the two newest employees are no higher than the salaries that other companies pay for workers with a similar level of experience.

2. The current pattern of human consumption of resources, in which we rely on nonrenewable resources, for example metal ore, must eventually change. Since there is only so much metal ore available, ultimately we must either do without or turn to renewable resources to take its place.

Which one of the following is an assumption required by the argument?

- (A) There are renewable resource replacements for all of the nonrenewable resources currently being consumed.
- (B) We cannot indefinitely replace exhausted nonrenewable resources with other nonrenewable resources.
- (C) A renewable resource cannot be exhausted by human consumption.
- (D) Consumption of nonrenewable resources will not continue to increase in the near future.
- (E) Ultimately we cannot do without nonrenewable resources.

Assumption Question Problem Set

3. In humans, ingested protein is broken down into amino acids, all of which must compete to enter the brain. Subsequent ingestion of sugars leads to the production of insulin, a hormone that breaks down the sugars and also rids the bloodstream of residual amino acids, except for tryptophan. Tryptophan then slips into the brain uncontested and is transformed into the chemical serotonin, increasing the brain's serotonin level. Thus, sugars can play a major role in mood elevation, helping one to feel relaxed and anxiety-free.

Which one of the following is an assumption on which the argument depends?

- (A) Elevation of mood and freedom from anxiety require increasing the level of serotonin in the brain.
 - (B) Failure to consume foods rich in sugars results in anxiety and a lowering of mood.
 - (C) Serotonin can be produced naturally only if tryptophan is present in the bloodstream.
 - (D) Increasing the level of serotonin in the brain promotes relaxation and freedom from anxiety.
 - (E) The consumption of protein-rich foods results in anxiety and a lowering of mood.
4. Publicity campaigns for endangered species are unlikely to have much impact on the most important environmental problems, for while the ease of attributing feelings to large mammals facilitates evoking sympathy for them, it is more difficult to elicit sympathy for other kinds of organisms, such as the soil microorganisms on which large ecosystems and agriculture depend.

Which one of the following is an assumption on which the argument depends?

- (A) The most important environmental problems involve endangered species other than large mammals.
- (B) Microorganisms cannot experience pain or have other feelings.
- (C) Publicity campaigns for the environment are the most effective when they elicit sympathy for some organism.
- (D) People ignore environmental problems unless they believe the problems will affect creatures with which they sympathize.
- (E) An organism can be environmentally significant only if it affects large ecosystems or agriculture.

5. Historian: Leibniz, the seventeenth-century philosopher, published his version of calculus before Newton did. But then Newton revealed his private notebooks, which showed he had been using these ideas for at least a decade before Leibniz's publication. Newton also claimed that he had disclosed these ideas to Leibniz in a letter shortly before Leibniz's publication. Yet close examination of the letter shows that Newton's few cryptic remarks did not reveal anything important about calculus. Thus, Leibniz and Newton each independently discovered calculus.

Which one of the following is an assumption required by the historian's argument?

- (A) Leibniz did not tell anyone about calculus prior to publishing his version of it.
- (B) No third person independently discovered calculus prior to Newton and Leibniz.
- (C) Newton believed that Leibniz was able to learn something important about calculus from his letter to him.
- (D) Neither Newton nor Leibniz knew that the other had developed a version of calculus prior to Leibniz's publication.
- (E) Neither Newton nor Leibniz learned crucial details about calculus from some third source.

Assumption Problem Set Answer Key

Question #1. Assumption. The correct answer choice is (C)

The stimulus to this problem contains a Shell Game, and you must read closely in order to identify it: in the first sentence the author equates “new employees” with “inexperienced workers.” Of course, a new employee is not necessarily inexperienced (the employee could have transferred from another company, etc.). The assumption that new employees are inexperienced is reflected in the correct answer, (C).

Answer choice (A): The author notes that the duties of the two new employees are too complex for them, but the author does not compare or imply a comparison to the tasks of other workers.

Answer choice (B): The author makes no assumption as to why the two new employees are being paid the salary they receive, only that their salary should be reduced. For example, the reason the employees are paid more could be that they are related to the owner of the company.

Answer choice (C): This is the correct answer, a Supporter.

Answer choice (D): This answer is an immediate Loser. No discussion or assumption is made about Barnes’ salary.

Answer choice (E): This answer would hurt the argument, and therefore it can never be an assumption of the argument.

Question #2. Assumption. The correct answer choice is (B)

The structure of the argument is as follows:

Premise:	There is only so much metal ore available.
Subconclusion/ Premise:	Ultimately we must either do without or turn to renewable resources to take its place.
Conclusion:	The current pattern of human consumption of resources, in which we rely on nonrenewable resources, for example metal ore, must eventually change.

At first glance the argument does not seem to have any holes. This would suggest a Defender answer is coming, and indeed that is the case.

Answer choice (A): The author does not need to assume this statement because the stimulus specifically indicates that “we must either *do without* or turn to renewable resources.” Since doing without is an option, the author is not assuming there are renewable replacements for all nonrenewable resources currently being consumed.

Assumption Problem Set Answer Key

Answer choice (B): This is the correct answer. This answer defends the conclusion that the consumption pattern must change by indicating that it would *not* be possible to simply replace one nonrenewable resource with another nonrenewable resource. If this answer did not make sense at first glance, you should have noted the negative language and then negated the answer. Using the Assumption Negation Technique, the following would clearly attack the conclusion: “We *can* indefinitely replace exhausted nonrenewable resources with other nonrenewable resources.” If the nonrenewable resources can be indefinitely replaced, why do we need to change our consumption habits?

Answer choice (C): The author’s argument concerns changing current consumption habits. Although the author does suggest turning to renewable resources, this alone would represent a change. The author does not make a long-term assumption that renewable resources can never be depleted. When faced with the negation of the answer choice, the author would likely reply: “If that eventuality does occur, then perhaps we will have to do without. In the meantime, we still need to change our consumption habits.” As you can see, the negation has not undermined the author’s position, and so this answer is incorrect.

Answer choice (D): The author does not make statements or assumptions about actual consumption patterns in the *near future*, only statements regarding what must *eventually* occur.

Answer choice (E): This answer, when rephrased to eliminate the double negative, reads as “Ultimately we must have nonrenewable resources.” Because this answer hurts the argument, the answer is incorrect.

Question #3. Assumption. The correct answer choice is (D)

The importance of this problem is not just in answering it correctly, but also in answering it quickly. A major portion of GMAT success is speed related, and a question like this is an opportunity to gain time. The first step is to recognize the argument structure:

- Premise: In humans, ingested protein is broken down into amino acids, all of which must compete to enter the brain.
- Premise: Subsequent ingestion of sugars leads to the production of insulin, a hormone that breaks down the sugars and also rids the bloodstream of residual amino acids, except for tryptophan.
- Premise: Tryptophan then slips into the brain uncontested and is transformed into the chemical serotonin, increasing the brain’s serotonin level.
- Conclusion: Sugars can play a major role in mood elevation, helping one to feel relaxed and anxiety-free.

At this point in your preparation, you should constantly be on the lookout for new elements that appear in the conclusion. This problem contains the new conclusion element of “a major role in mood elevation, helping one to feel relaxed and anxiety-free.” Because this element immediately follows the assertion that the brain’s serotonin level has been increased, you should attack the answer choices by looking for an

Assumption Problem Set Answer Key

answer that fits the Supporter relationship that an increase serotonin leads to an elevated mood. Only answer choices (A) and (D) contain these two elements, and you should examine them first as you seek to accelerate through this problem:

Answer choice (A): Although the author assumes that raising the level of serotonin is sufficient to elevate mood, this answer claims that it is necessary. Hence, this answer is incorrect.

Answer choice (D): This is the correct answer. The author states that after the action of the sugars, more serotonin enters the brain. The author then concludes that this leads to a mood elevation. Thus, the author assumes that serotonin has an effect on the mood level.

Answer choice (B): The argument refers to what happens when sugars are ingested. No assumption is made about what occurs when foods rich in sugars are not ingested.

Answer choice (C): Although the argument states that tryptophan is transformed into serotonin, no assumption is made that this is the only way serotonin is produced.

Answer choice (E): The author does not assume the statement in this answer. We know from the first sentence of the stimulus that ingested protein is broken down into amino acids which compete to enter the brain. This competition could result in mood elevation even without the ingestion of sugars since some amino acids will enter the brain (some could be tryptophan, for example). Thus, since the author's argument contains a scenario that would allow for the opposite of this answer choice to occur, this answer is not an assumption of the argument.

Question #4. Assumption. The correct answer choice is (A)

This is a challenging problem because two of the wrong answer choices are attractive. The argument itself is not overly complex, but you must pay attention to the language. Consider the conclusion of the argument:

“Publicity campaigns for endangered species are unlikely to have much impact on the most important environmental problems.”

Ask yourself, why is it that these campaigns are unlikely to have much impact on the *most important* problems? According to the premises, the reason is that “it is more difficult to elicit sympathy for other kinds of organisms [than large mammals].” The reasoning shows that the author believes there is a connection between the important problems and organisms that are not large mammals. This Supporter connection is perfectly reflected in answer choice (A), the correct answer. Again, when faced with an Assumption question, remember to look for connections between rogue elements in the argument, and then seek that connection in the answer choices.

Answer choice (B): The argument is about eliciting sympathy, and no assumption is made about microorganisms *experiencing* pain.

Assumption Problem Set Answer Key

Answer choice (C): This is a Shell Game answer. The conclusion is specific about “publicity campaigns for endangered species” as they relate to environmental problems. This answer refers to “publicity campaigns” in general—a different concept. It may be that the most effective publicity campaign for the environment has nothing to do with organisms. Consequently, this answer is not an assumption of the argument.

Answer choice (D): This answer choice is worded too strongly and is an Exaggerated answer. “Ignore” goes further than what the author implies. The author indicates that it is “*more difficult* to elicit sympathy for other kinds of organisms,” but the author does not say it is impossible to get sympathy from individuals if a non-large mammal is involved. Further, the argument is specific about the impact on the “most important” problems, and this answer goes well beyond that domain.

Answer choice (E): The microorganisms discussed at the end of the argument are an example (“such as”); therefore, the author does not assume this type of relationship must be true in order for the conclusion to be true.

Question #5. Assumption. The correct answer choice is (E)

The conclusion of the argument asserts that Leibniz and Newton each independently discovered calculus, and in drawing the conclusion the author addresses the possibility Newton may have influenced Leibniz, and then rejects that possibility. A review of the argument does not reveal any conspicuous flaws, and so upon encountering the question stem, you should expect to see a Defender answer. As such, do not spend time trying to prephrase an answer—just make sure you know the facts of the argument.

Answer choice (A): The argument is about the independent discovery of calculus; the author makes no assumption that Leibniz did not tell anyone else, and indeed the fact that Newton did tell Leibniz is accepted by the author as not undermining the conclusion.

Answer choice (B): Negate the answer: “A third person independently discovered calculus prior to Newton and Leibniz.” Would this negated answer attack the argument? No, the author would just assert that three different parties independently discovered calculus.

Answer choice (C): The author cites Newton’s letter as evidence that Newton felt he had disclosed ideas to Leibniz prior to Leibniz’s publication date. No assumption is made that Newton felt that what was disclosed allowed Leibniz to learn something important. If you are uncertain of this answer, negate the choice to see if it weakens the argument.

Answer choice (D): This is clearly not an assumption of the argument because the author discusses Newton’s letter to Leibniz prior to Leibniz’s publication date.

Answer choice (E): This is the correct answer. The answer can be difficult because it is somewhat similar to answer choice (B), which many people already eliminated by the time they reached this answer. Answer (E) is different from answer (B) because it involves learning details from a third source. This is important because the conclusion references the *independent discovery* of calculus, and so the author must believe that neither Newton nor Leibniz learned anything substantial about calculus from other sources.

Assumption Problem Set Answer Key

This elimination of an idea that weakens the argument is the essence of a Defender answer choice. To further confirm the answer, consider the negation of this answer choice ("neither...nor" becomes "either...or"): "Either Newton or Leibniz learned crucial details about calculus from some third source." This negated answer undermines the assertion that Leibniz and Newton each independently discovered calculus. Consequently, this is the correct answer.

C HAPTER NINE: RESOLVE THE PARADOX QUESTIONS

Resolve the Paradox Questions

Resolve the Paradox questions are generally easy to spot because of their distinctive stimuli: each stimulus presents a situation where two ideas or occurrences contradict each other. Because most people are very good at recognizing these paradox scenarios, they usually know after reading the stimulus that a Resolve the Paradox question is coming up.

Stimulus Peculiarities

Besides the discrepant or contradictory facts, most Resolve the Paradox stimuli contain the following features:

1. No conclusion

One of the hallmarks of a Resolve the Paradox question is that the stimulus does not contain a conclusion. The author is not attempting to persuade you, he or she just presents two sets of contradictory facts. Thus, when you read a stimulus without a conclusion that contains a paradox, expect to see a Resolve question. If you read a fact set that does not contain a paradox, expect to see a Must Be True question or a Cannot Be True question (less likely).

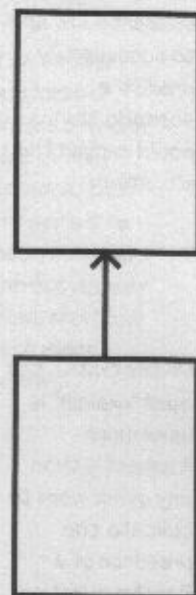
2. Language of contradiction

In order to present a paradox, the test makers use language that signals a contradiction is present, such as:

But
However
Yet
Although
Paradoxically
Surprisingly

If you can recognize the paradox present in the stimulus, you will have a head start on prephrasing the answer and completing the problem more quickly.

Second Family
Information
Model:



Question Stem Features

Resolve the Paradox question stems are easy to identify, and typically contain the following features:

1. An indication that the answer choices should be accepted as true

You should attempt to prephrase an answer; many students are able to successfully predict a scenario that would explain the situation.

Because Resolve the Paradox questions fall into the Second Question Family, you must accept the answer choices as true and then see if they resolve the paradox. Typically, the question stem will contain a phrase such as, "which of the *following*, if true, ..."

2. Key words that indicate your task is to resolve a problem

To convey the nature of your task, Resolve the Paradox question stems usually use words from both of the lists below. The first list contains words used to describe the action you must take, the second list contains words used to describe the paradox present in the stimulus:

On the GMAT, the word "explain" is used more frequently than any other word to indicate the presence of a Resolve question.

Action

Resolve
Explain
Reconcile

Problem

Paradox
Discrepancy
Contradiction
Conflict
Puzzle

Here are several Resolve the Paradox question stem examples:

A Resolve question would present four incorrect answers that resolve or explain the situation. The one correct answer would either confuse the situation, or, more likely, have no impact on the situation.

"Which of the following, if true, most helps to resolve the apparent paradox?"

"Which of the following, if true, most helps to explain the discrepancy described above?"

"Which of the following, if true, best reconciles the seeming discrepancy described above?"

"Which of the following hypotheses best explains the contrast described above?"

Active Resolution

When first presented with a Resolve question, most students seek an answer choice that destroys or disproves one side of the situation. They follow the reasoning that if one side can be proven false, then the paradox will be eliminated. While this is true, the test makers know that such an answer would be obvious (it would simply contradict part of the facts given in the stimulus) and thus this type of answer does not appear in these questions. Instead, the correct answer will actively resolve the paradox, that is, it will allow both sides to be factually correct and it will either explain how the situation came into being or add a piece of information that shows how the two ideas or occurrences can coexist.

Because you are not seeking to disprove one side of the situation, you must select the answer choice that contains a *possible cause* of the situation. So, when examining answers, ask yourself if the answer choice could lead to the situation in the stimulus. If so, the answer is correct.

Please take a moment to complete the following problem:

1. Provinces and states with stringent car safety requirements, including required use of seat belts and annual safety inspections, have on average higher rates of accidents per kilometer driven than do provinces and states with less stringent requirements. Nevertheless, most highway safety experts agree that more stringent requirements do reduce accident rates.

Which one of the following, if true, most helps to reconcile the safety experts' belief with the apparently contrary evidence described above?

- (A) Annual safety inspections ensure that car tires are replaced before they grow old.
- (B) Drivers often become overconfident after their cars have passed a thorough safety inspection.
- (C) The roads in provinces and states with stringent car safety programs are far more congested and therefore dangerous than in other provinces and states.
- (D) Psychological studies show that drivers who regularly wear seat belts often come to think of themselves as serious drivers, which for a few people discourages reckless driving.
- (E) Provinces and states with stringent car safety requirements have, on average, many more kilometers of roads than do other provinces and states.

The correct answer will positively resolve the paradox so that both sides are true and the conditions in the stimulus have been met.

If an answer supports or proves only one side of the paradox, that answer will be incorrect. The correct answer must show how both sides coexist.

If the stimulus contains a paradox where two items are similar, then an answer choice that explains a difference between the two cannot be correct.

Conversely, if the stimulus contains a paradox where two items are different, then an answer choice that explains why the two are similar cannot be correct.

In short, a similarity cannot explain a difference, and a difference cannot explain a similarity.

The paradox in the argument is that the provinces and states that have more stringent safety requirements also have higher average rates of accidents. Even so, experts agree that the more stringent requirements actually are effective. This type of “surprisingly low/high rate of success” scenario has appeared in a number of Resolve the Paradox questions, including the following:

An anti-theft device is known to reduce theft, but cars using the anti-theft device are stolen at a higher rate than cars without the device.

Explanation: The device is placed on highly desirable cars that are prone to being stolen, and the device actually lessens the rate at which they are stolen.

A surgeon has a low success rate while operating, but the director of the hospital claims the surgeon is the best on the staff.

Explanation: The surgeon operates on the most complex and challenging cases.

A bill collector has the lowest rate of success in collecting bills, but his manager claims he is the best in the field.

Explanation: The bill collector is assigned the toughest cases to handle.

These scenarios underscore the issue present in the question: other factors in the situation make it more difficult to be successful. With the car safety requirements, you should look for an answer that shows that there is a situation with the roads that affects the accident rates. A second possible explanation is that the seat belts are not actually used by a majority of drivers and the safety inspections are not made or are rubber-stamp certifications. This answer is less likely to appear because it is fairly obvious.

Answer choice (A): The stimulus specifies that annual safety inspections—regardless of what is examined—are already in place. Therefore, this answer does not explain why the average rate of accidents is higher in those states.

Answer choice (B): Assuming that overconfidence leads to accidents, the answer could support the assertion that states with more stringent requirements have higher accident rates. But, this answer would also suggest that the experts are wrong in saying that more stringent standards reduce accident rates, so this answer cannot be correct.

Answer choice (C): This is the correct answer, and the answer conforms to the discussion above. If the roads are generally more dangerous, then the stringent requirements could reduce the accident rate while at the same time the accident rate could remain relatively high. Since this scenario allows all sides of the

situation to be correct and it explains how the situation could occur, this is the correct answer.

Answer choice (D): This answer supports only one side of the paradox. The answer confirms that the experts are correct, but it does not explain why these provinces have higher accident rates. Thus, as explained in the second sidebar on page 203, it does not resolve the paradox.

Answer choice (E): This answer appears attractive at first, but the number of miles of roadway in the provinces is irrelevant because the stimulus specifically references "accidents per kilometer driven." Since the accident rate is calculated as per-miles-driven, the actual number of miles of roadway is irrelevant.

Address the Facts

When attempting to resolve the paradox in the stimulus, you must address the facts of the situation. Many incorrect answers will try to lure you with reasonable solutions that do not quite meet the stated facts. These answers are incorrect. The correct answer *must* conform to the specifics of the stimulus otherwise how could it resolve or explain the situation?

Please take a moment to complete the following problem:

2. Calories consumed in excess of those with which the body needs to be provided to maintain its weight are normally stored as fat and the body gains weight. Alcoholic beverages are laden with calories. However, those people who regularly drink two or three alcoholic beverages a day and thereby exceed the caloric intake necessary to maintain their weight do not in general gain weight.

Which one of the following, if true, most helps to resolve the apparent discrepancy?

- (A) Some people who regularly drink two or three alcoholic beverages a day avoid exceeding the caloric intake necessary to maintain their weight by decreasing caloric intake from other sources.
- (B) Excess calories consumed by people who regularly drink two or three alcoholic beverages a day tend to be dissipated as heat.
- (C) Some people who do not drink alcoholic beverages but who eat high-calorie foods do not gain weight.
- (D) Many people who regularly drink more than three alcoholic beverages a day do not gain weight.
- (E) Some people who take in fewer calories than are normally necessary to maintain their weight do not lose weight.

The paradox in this problem is that alcohol drinkers who surpass the threshold for calorie intake should gain weight, but they do not. Most people, upon reading the stimulus, prephrase an answer involving exercise or some other way to work off the expected weight gain. Unfortunately, a perfect match to this prephrase does not appear, and instead students are faced with a tricky answer that preys upon this general idea while at the same time it fails to meet the circumstances in the stimulus.

Answer choice (A): Read closely! The stimulus specifies that people who regularly drink two or three alcoholic beverages a day thereby *exceed* the necessary caloric intake. This answer, which discusses individuals who *avoid exceeding* the caloric intake necessary, therefore addresses a different group of people from that in the stimulus. Since information about a different group of people does not explain the situation, this answer is incorrect.

This answer is attractive because it uses the idea of getting rid of or avoiding calories, but it violates one of the precepts of the stimulus. Remember, you must look very closely at the circumstances in the stimulus and make sure that the answer you select matches those circumstances.

Answer choice (B): This is the correct answer. If the excess calories are dissipated as heat, then there would be no weight gain. Hence, alcohol drinkers can consume excess calories and still not gain weight.

Some students object to this answer because the situation seems unrealistic. Can heat dissipation actually work off dozens if not hundreds of calories? According to the question stem, yes. Remember, the question stem tells you that each answer choice should be taken as true. Since this answer choice clearly states that the excess calories tend to be dissipated, you must accept that as true and then analyze what effect that would have.

Answer choice (C): The stimulus discusses “people who regularly drink two or three alcoholic beverages a day and thereby exceed the caloric intake necessary.” This answer choice addresses a different group of people than those discussed in the stimulus.

Answer choice (D): The first flaw in this answer is that it simply states that individuals consuming alcohol do not gain weight but it offers no *explanation* for why these people have no weight gain. The second flaw in the problem is that it addresses the wrong group of people. The stimulus discusses people who drink two or three alcoholic beverages a day; this answer addresses people who drink *more than* three alcoholic beverages a day.

Answer choice (E): Again, this answer discusses a different group of people than those in the stimulus. The stimulus discusses people who exceed the necessary caloric intake; this answer addresses people who do not meet the necessary caloric intake.

Resolve the Paradox Question Review

Each Resolve the Paradox stimulus presents a situation where two ideas or occurrences contradict each other.

Besides the discrepant or contradictory facts, most Resolve the Paradox stimuli contain the following features:

1. No conclusion
2. Language of contradiction

The correct answer will actively resolve the paradox—it will allow both sides to be factually correct and it will either explain how the situation came into being or add a piece of information that shows how the two ideas or occurrences can coexist.

Because you are not seeking to disprove one side of the situation, you must select the answer choice that contains a *possible cause* of the situation. So, when examining answers, ask yourself if the answer choice could lead to the situation in the stimulus. If so, the answer is correct. The following types of answers are incorrect:

1. Explains only one side of the paradox

If an answer supports or proves only one side of the paradox, that answer will be incorrect. The correct answer must show how both sides coexist.

2. Similarities and differences

If the stimulus contains a paradox where two items are similar, then an answer choice that explains a difference between the two cannot be correct.

Conversely, if the stimulus contains a paradox where two items are different, then an answer choice that explains why the two are similar cannot be correct.

In short, a similarity cannot explain a difference, and a difference cannot explain a similarity.

When attempting to resolve the problem in the stimulus, you must address the facts of the situation. Many answers will try to lure you with reasonable solutions that do not quite meet the stated facts. These answers are incorrect.

All Resolve the Paradox questions require you to seek a cause of the scenario in the stimulus. However, we do not classify these questions as "CE" questions because the causality does not appear in the stimulus. The CE designator is reserved solely for indicating when causality is featured as the form of reasoning in an argument.

Resolve the Paradox Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 210*

1. Industry experts expect improvements in job safety training to lead to safer work environments. A recent survey indicated, however, that for manufacturers who improved job safety training during the 1980s, the number of on-the-job accidents tended to increase in the months immediately following the changes in the training programs.

Which one of the following, if true, most helps to resolve the apparent discrepancy in the passage above?

- (A) A similar survey found that the number of on-the-job accidents remained constant after job safety training in the transportation sector was improved.
- (B) Manufacturers tend to improve their job safety training only when they are increasing the size of their workforce.
- (C) Manufacturers tend to improve job safety training only after they have noticed that the number of on-the-job accidents has increased.
- (D) It is likely that the increase in the number of on-the-job accidents experienced by many companies was not merely a random fluctuation.
- (E) Significant safety measures, such as protective equipment and government safety inspections, were in place well before the improvements in job safety training.

2. Cigarette companies claim that manufacturing both low- and high-nicotine cigarettes allows smokers to choose how much nicotine they want. However, a recent study has shown that the levels of nicotine found in the blood of smokers who smoke one pack of cigarettes per day are identical at the end of a day's worth of smoking, whatever the level of nicotine in the cigarettes they smoke.

Which one of the following, if true, most helps to explain the finding of the nicotine study?

- (A) Blood cannot absorb more nicotine per day than that found in the smoke from a package of the lowest-nicotine cigarettes available.
- (B) Smokers of the lowest-nicotine cigarettes available generally smoke more cigarettes per day than smokers of high-nicotine cigarettes.
- (C) Most nicotine is absorbed into the blood of a smoker even if it is delivered in smaller quantities.
- (D) The level of tar in cigarettes is higher in low-nicotine cigarettes than it is in some high-nicotine cigarettes.
- (E) When taking in nicotine by smoking cigarettes is discontinued, the level of nicotine in the blood decreases steadily.

Resolve the Paradox Problem Set

3. Raisins are made by drying grapes in the sun. Although some of the sugar in the grapes is caramelized in the process, nothing is added. Moreover, the only thing removed from the grapes is the water that evaporates during the drying, and water contains no calories or nutrients. The fact that raisins contain more iron per calorie than grapes do is thus puzzling.

Which one of the following, if true, most helps to explain why raisins contain more iron per calorie than do grapes?

- (A) Since grapes are bigger than raisins, it takes several bunches of grapes to provide the same amount of iron as a handful of raisins does.
- (B) Caramelized sugar cannot be digested, so its calories do not count toward the calorie content of raisins.
- (C) The body can absorb iron and other nutrients more quickly from grapes than from raisins because of the relatively high water content of grapes.
- (D) Raisins, but not grapes, are available year-round, so many people get a greater share of their yearly iron intake from raisins than from grapes.
- (E) Raisins are often eaten in combination with other iron-containing foods, while grapes are usually eaten by themselves.

4. Vervet monkeys use different alarm calls to warn each other of nearby predators, depending on whether the danger comes from land or from the air.

Which one of the following, if true, contributes most to an explanation of the behavior of vervet monkeys described above?

- (A) By varying the pitch of its alarm call, a vervet monkey can indicate the number of predators approaching.
- (B) Different land-based predators are responsible for different numbers of vervet monkey deaths.
- (C) No predators that pose a danger to vervet monkeys can attack both from land and from the air.
- (D) Vervet monkeys avoid land-based predators by climbing trees but avoid predation from the air by diving into foliage.
- (E) Certain land-based predators feed only on vervet monkeys, whereas every predator that attacks vervet monkeys from the air feeds on many different animals.

Resolve the Paradox Problem Set Answer Key

Question #1. Resolve. The correct answer choice is (B)

The paradox in the stimulus is: for manufacturers who improved job safety training during the 1980s there was an increase in the number of on-the-job accidents.

Answer choice (A): This answer does not provide an explanation for the paradox in the stimulus. Some students eliminate this answer because it addresses the transportation industry, but information about the transportation industry could be used to analogically explain the issue in the manufacturing industry (but, to be correct the answer would have to offer some further relevant parallel between the two industries).

Answer choice (B): This is the correct answer. If the workforce is increasing, more accidents would be expected. Thus, safety training could improve the safety of the work environment (as measured by average number of accidents per worker, for example) while at the same time the number of total accidents could increase. Because this answer allows both sides to be true and it explains the circumstance in the stimulus, this answer is correct. In Chapter Twelve we will discuss average versus total numbers, and that will further explain the construction of this question.

Answer choice (C): This would explain an increase in accidents *before* the improvements in job safety training, but the issue in the stimulus is an increase *after* the improvements in safety training.

Answer choice (D): This answer further confuses the issue. If the fluctuation *was* random, that could explain how an increase in accidents could follow safety training. By stating that the increase was *not* random, a possible cause of the scenario is eliminated.

Answer choice (E): This answer shows that the level of safety was at least minimal prior to the safety training, but this does not help explain why an increase in accidents followed the training.

Question #2. Resolve. The correct answer choice is (A)

In rough terms, the paradox in the stimulus is that smokers of one pack of low-nicotine cigarettes have an identical nicotine level at the end of the day as smokers of one pack of high-nicotine cigarettes. This similarity must be explained by a similarity, not a difference.

Answer choice (A): This is the correct answer. The answer choice indicates that there is a similarity in the blood such that the maximum amount of nicotine absorbed is identical for everyone. Because the maximum amount of nicotine absorbed per day is equal to the amount of nicotine in a pack of low-nicotine cigarettes, each person absorbs the amount of nicotine equal to that in the low-nicotine pack regardless of the type of cigarette smoked. Additional nicotine is not absorbed into the blood of smokers of the high-nicotine brand. Since this answer explains the paradox, this is the correct answer.

Answer choice (B): Read closely! The stimulus is specifically about smokers who “smoke one pack of cigarettes per day.” This answer discusses smoking different numbers of cigarettes and thus it fails to meet the circumstances in the stimulus.

Answer choice (C): This answer confuses the issue because it indicates that most nicotine is absorbed into

Resolve the Paradox Problem Set Answer Key

the system. From this fact one would expect that those smoking high-nicotine cigarettes would have higher nicotine levels than low-nicotine cigarette smokers.

Answer choice (D): The stimulus does not address the level of tar in cigarettes, nor can we make any judgment about how tar affects nicotine levels.

Answer choice (E): This would apply to any smoker, and as this addresses an effect that occurs after smoking is stopped, it does not help us understand why the nicotine rose to identical levels regardless of the kind of cigarette smoked.

Question #3. Resolve. The correct answer choice is (B)

The paradox in the stimulus is that raisins contain more iron per calorie than grapes even though the two are almost identical in composition. But there is a difference: "some of the sugar in grapes is caramelized" as the grapes are dried in the sun. Since this is the only stated difference between the two that could affect the calorie count (water has no calories), you should focus on an answer that discusses this difference.

Answer choice (A): This answer essentially states that grapes are bigger than raisins, and you need several bunches to equal a handful of raisins. The issue is not the size of the grapes or raisins!

Answer choice (B): This is the correct answer. If the iron content in the raisins and grapes is identical, but raisins have fewer calories for counting purposes, then the iron per calorie will be higher for raisins, as highlighted by the following example:

	<u>Raisins</u>	<u>Grapes</u>
Units of Iron	100	100
Countable Calories	10	20
Iron per Calorie	10	5

Note that the paradox could have addressed any common element between raisins and grapes (such as fiber or fat), and raisins would always have the higher per calorie content since they contain fewer countable calories.

Answer choice (C): The paradox in the stimulus does not involve the rate at which the body can absorb iron or any other nutrient. This answer misses the point and is incorrect.

Answer choice (D): The availability of raisins and grapes is not an issue in the stimulus. The answer then discusses iron, but the point made about yearly intake is irrelevant.

Answer choice (E): The comparison in the stimulus is between grapes and raisins. This answer, which brings in other food items, is irrelevant.

Resolve the Paradox Problem Set Answer Key

Question #4. Resolve. The correct answer choice is (D)

The situation in the stimulus is that vervet monkeys use different calls depending on where predators come from. The correct answer must explain why the calls are different (again, difference versus similarity is an issue). Note that the stimulus does not contain a true paradox, just an odd situation that is presented without explanation.

Answer choice (A): This answer states that vervet monkeys vary the calls in order to indicate the number of predators, but the answer does not explain why different calls are used for land versus air predators. This answer is attractive because it shows that different calls can be used to indicate different things, but it is wrong because it does not explain the behavior of the monkeys as described in the stimulus.

Answer choice (B): This answer addresses only land-based predators and does not explain the difference described in the stimulus.

Answer choice (C): This answer states that the predators using land attacks are different from the predators using air attacks, but this information does not explain why vervet monkeys use different calls to indicate that fact.

Answer choice (D): This is the correct answer. Because vervet monkeys react to predators in different ways, they would need to know if the predator was coming by land or air. Hence, the different calls are used to tell the monkeys whether they should climb trees or dive into the foliage. Since this answer explains the behavior of vervet monkeys, this answer is correct.

Answer choice (E): The diet of selected predators of vervet monkeys is irrelevant and does not help explain why vervet monkeys use different calls depending on the direction of the attack.

CHAPTER TEN: METHOD OF REASONING AND FLAW IN THE REASONING QUESTIONS

Method of Reasoning Questions

Method of Reasoning questions require you to select the answer choice that best describes the method used by the author to make the argument. Structurally, Method of Reasoning questions are simply abstract Must Be True questions: instead of identifying the facts of the argument, you must identify the logical organization of the argument.

As part of the First Family of Questions, Method of Reasoning questions feature the following information structure, modified slightly for the abstract nature of these questions:

1. You can use only the information in the stimulus to prove the correct answer choice.
2. Any answer choice that describes an element or a situation that does not occur in the stimulus is incorrect.

The stimulus in a Method question can contain valid or flawed reasoning.

Method of Reasoning question stems use a variety of formats, but in each case the stem refers to the method, technique, strategy, or process used by the author while making the argument. Here are several question stem examples:

"The method of the argument is to"

"The argument proceeds by"

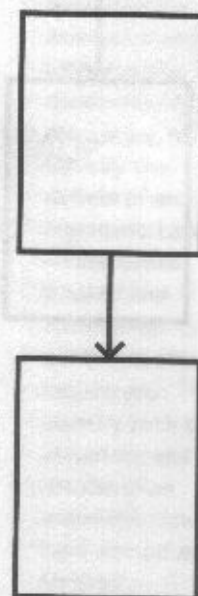
"The argument derives its conclusion by"

"Which of the following describes the technique of reasoning used above?"

"Which of the following is an argumentative strategy employed in the argument?"

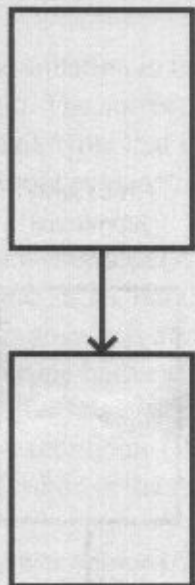
"The argument employs which one of the following reasoning techniques?"

First Family
Information
Model:



As you attack each question, keep in mind that Method of Reasoning questions are simply abstract Must Be True questions. Use the information in the stimulus to prove or disprove each answer choice.

First Family
Information
Model:



In the online student area for this book we have included an extended discussion of common errors of reasoning.

Flaw in the Reasoning Questions

Flaw in the Reasoning questions are exactly the same as Method of Reasoning questions with the important exception that the question stem indicates that the reasoning in the stimulus is flawed. Because the question stem reveals that a flaw is present, you need not make a determination of the validity of the stimulus; the question stem makes the determination for you. This information provides you with a tremendous advantage because you can identify the error of reasoning in the stimulus *before* proceeding to the answer choices. And, if you did not realize there was an error of reasoning in the stimulus, the question stem gives you the opportunity to re-evaluate the argument and find the error of reasoning.

When indicating that a flaw is present in the argument, the test makers will use phrases such as “the reasoning is flawed” and “the argument is vulnerable,” or synonymous phrases. Here are several example question stems:

“Which of the following most accurately describes a flaw in the argument’s reasoning?”

“The reasoning in the argument is most vulnerable to criticism on the grounds that the argument”

“The reasoning above is flawed because it fails to recognize that”

“A questionable aspect of the reasoning above is that it”

To identify the right answer choice, carefully consider the reasoning used in the stimulus. The correct answer will identify the error in the author’s reasoning and then describe that error in general terms. Beware of answers that describe a portion of the stimulus but fail to identify the error in the reasoning.

Because Flaw in the Reasoning questions are so similar to Method of Reasoning questions, we will discuss the two in tandem throughout this chapter.

Important Note: Method and Flaw questions appear infrequently in GMAT Critical Reasoning. However, we have included this question type for two important reasons:

1. Method and Flaw questions are more likely to show up when a test taker is doing very well on the GMAT.
2. The process of identifying and understanding the method of reasoning in the argument invaluable when you are attempting to perform other tasks with an argument, such as Weaken, Strengthen, etc.

Prephrasing in Method and Flaw Questions

Method of Reasoning and Flaw in the Reasoning questions are challenging because they involve abstract thinking, which focuses on the *form* of the argument instead of the concrete facts of the argument. The answer choices will therefore describe the argument in abstract terms, and many students have difficulty because the test makers are experts at manipulating those terms to describe the argument in unexpected and deceptive ways. Often, students will have a firm grasp of the structure of the argument only to struggle when none of the answers match their prephrase. This situation occurs because the test makers can use one or two words to describe entire sections of the stimulus, and you are rigorously tested on your knowledge of the mechanics of the argument and your ability to discern the references in the answer choice.

When prephrasing in Method and Flaw questions, you may understand the details of the stimulus but not understand the structure of the argument. Thus, each answer may sound implausible since they are related primarily to the logical organization of the argument. Therefore, you must think about the structure of the argument *before* examining the answer choices. However, do not expect to see your exact prephrase as the answer; there are simply too many variations on the way an argument can be described. Instead, make a general, abstract prephrase of what occurred in the argument and then rigorously examine each answer choice to see if the test makers have created an answer that paraphrases your prephrase. Many students are deceived by the description used by the test makers, and the only way to overcome this problem is to compare the description given in the answer choice to the stimulus.

The Fact Test in Method and Flaw Questions

Because Method of Reasoning and Flaw in the Reasoning questions are similar to Must Be True questions, you can use the principle behind the Fact Test to destroy incorrect answers. In Method and Flaw question, the Fact Test works as follows:

If an answer choice describes an event that did not occur in the stimulus, then that answer is incorrect.

The test makers will try to entice you by creating incorrect answer choices that contain elements that did not occur, and you must avoid those answers and select the answer choice that describes what occurred in the stimulus. For example, if an answer choice states, "The argument accepts a claim on the basis of public opinion of the claim," *all* parts of the answer must be identifiable in the stimulus. First you must be able to identify where the author "accepts a claim," and then you must be able to identify where that is done "on the basis of public opinion of the claim." If you cannot identify part of an answer as having occurred in the stimulus, that answer is incorrect.

You may not have noticed, but this book began with the most concrete questions and slowly moved towards the most abstract questions. For example, we began with Must Be True questions, which require you to identify the details of an argument. Later we discussed Weaken and Strengthen questions, which require you to identify both the structure and details of an argument. Now we have arrived at Method questions, which focus much more on structure. Because abstract thinking requires more work than concrete thinking, most students find abstract questions difficult.

Watch out for answers that are partially true—that is, answers that contain a description of something that happened in the argument but that also contain additional things that did not occur. For example, an answer choice states that, “The author disagrees with the analogy used by the critic.” When examining this answer, you must find both the “disagreement” and the “analogy”; if you can only find one, or neither, the answer is wrong. But let us say you know the author disagrees with the critic. That is a good start, but you will still have to find disagreement with the analogy for the answer to be correct.

Stimulus Notes

The stimuli for both Method and Flaw questions will contain an argument, and in the case of a Method question the argument can contain either valid or invalid reasoning; in the case of a flaw question the argument must contain invalid reasoning.

Because recognizing argument structure is such an important part of attacking Method and Flaw questions, you must watch for the presence of the premise and conclusion indicators discussed in Chapter Two. These indicators will help you identify the structure of the argument and help you better understand the answer choices.

Incorrect Answers in Method and Flaw Questions

In Chapter Four we discussed several types of incorrect answers that appear in Must Be True questions. In this section we will review selected answer types from that chapter that apply to Method and Flaw questions and add an additional wrong answer type.

1. “New” Element Answers

Because correct Method of Reasoning answers must be based on elements of the stimulus, an answer that describes something that did not occur or describes an element new to the argument cannot be correct. All of the wrong answer choices described below are simply very specific variations on this theme.

2. Half Right, Half Wrong Answers

The makers of the GMAT love to present answers that start out by describing something that in fact occurred in the stimulus. Unfortunately, they often end by describing something that did *not* occur in the stimulus. The rule for these answers is that half wrong equals all wrong, and these answers are always incorrect.

Some Method of Reasoning answer choices can be difficult to understand because they are written in a way that is obviously designed to be confusing. The test makers excel at using deceptive language to make wrong answers attractive and to hide the correct answer.

3. Exaggerated Answers

Exaggerated Answers take a situation from the stimulus and stretch that situation to make an extreme statement that is not supported by the stimulus. Be careful, though! Just because an answer choice contains extreme language does not mean that the answer is incorrect.

4. The Opposite Answer

As the name suggests, the Opposite Answer provides an answer that is exactly opposite of correct.

5. The Reverse Answer

The Reverse Answer is attractive because it contains familiar elements from the stimulus, but reverses them in the answer. Since the reversed statement does not describe what occurred in the stimulus, it must be incorrect.

Interestingly, the incorrect answer choices in any Method or Flaw question can be a helpful study aid in preparing for future questions. Since the makers of the GMAT tend to reuse certain methods of reasoning, familiarizing yourself with those methods and the language used to describe them helps you prepare for when you encounter them again. You should carefully study all Method of Reasoning and Flaw in the Reasoning answers—correct and incorrect—and it would not be unreasonable to keep a list of the different types of methods you encounter. Remember, the wrong answer choice on one question could be the right answer choice on another question. After you complete the problem and are reviewing each wrong answer choice, try to imagine what type of argument would be needed to fit that answer. This exercise will strengthen your ability to recognize any type of argument structure.

As part of the First Family, Method and Flaw questions are grouped with Must Be True, Main Point, etc. Each type of question shares similar characteristics, but the exact execution of each is different. For example, one way to compare Must Be True questions to Method and Flaw questions is to use an analogy about trees in a forest. A Must Be True question is like examining a single tree and looking at the details: the bark, the branches, the leaves, etc. A Method or a Flaw question requires you to look at that same tree, but from a different perspective, one that is farther away and places that tree in the context of the forest. You are no longer looking at the individual branches and leaves, but rather at the general structure of the tree.

Idea Application: Correct and Incorrect Answers Analyzed

In this section we present and analyze two Critical Reasoning questions. We will use the two examples to discuss the various answer types presented in the previous section and to discuss the language used by the test makers in the answer choices.

Please take a moment to complete the following problem:

1. Garbage in this neighborhood probably will not be collected until Thursday this week. Garbage is usually collected here on Wednesdays, and the garbage collectors in this city are extremely reliable. However, Monday was a public holiday, and after a public holiday that falls on a Monday, garbage throughout the city is supposed to be collected one day later than usual.

The argument proceeds by

- (A) treating several pieces of irrelevant evidence as though they provide support for the conclusion
- (B) indirectly establishing that one thing is likely to occur by directly ruling out all of the alternative possibilities
- (C) providing information that allows application of a general rule to a specific case
- (D) generalizing about all actions of a certain kind on the basis of a description of one such action
- (E) treating something that is probable as though it were inevitable

As usual, we begin by analyzing the structure of the problem:

- Premise: Garbage is usually collected here on Wednesdays, and the garbage collectors in this city are extremely reliable.
- Premise: Monday was a public holiday.
- Premise: After a public holiday that falls on a Monday, garbage throughout the city is supposed to be collected one day later than usual.
- Conclusion: Garbage in this neighborhood probably will not be collected until Thursday this week.

The argument is sound and the conclusion seems reasonable. The language in the conclusion is not absolute (“probably”), and this is justified since the language used in the argument—“usually” and “supposed to be”—is also probabilistic. Knowing that the argument is valid, the question you must ask yourself is, “How would I describe the structure of this argument?”

Answer choice (A): This answer forces you to make an assessment of the premises (the “evidence”) as they relate to the conclusion. Are the premises irrelevant to the conclusion? Clearly not. Therefore, this answer is incorrect.

Answer choice (B): This is a Half Right, Half Wrong answer. The argument does establish “that one thing is likely to occur.” But, is this established by ruling out *all* of the alternative possibilities? No, to do that would mean presenting arguments against the garbage being collected on Friday, Saturday, Sunday, etc. Since this section of the answer choice does not occur, this answer is incorrect.

Also, because the argument does not rule out all the alternatives, the conclusion is not established “indirectly.”

Answer choice (C): This is the correct answer. Consider each piece of the argument:

“providing information”—a variety of information about the garbage situation is provided.

“application of a general rule”—the general rule is that “After a public holiday that falls on a Monday, garbage throughout the city is supposed to be collected one day later than usual.”

“to a specific case”—the specific case is the pickup of garbage this week in this neighborhood.

Students who are good at Method and Flaw questions tend to be good at other question types as well. Why? Because question types such as Weaken and Strengthen require a knowledge of how the argument is structured. Thus, studying Method and Flaw questions will improve your ability to solve other question types.

Given that all elements occurred and the answer presents an accurate

description of the way the author made his or her argument, this answer is correct. Now, take a moment and compare this answer to the prephrase you made after reading the stimulus. How similar are the two? Given that you may not be familiar with the language used by the test makers, the two may not be very similar. As your preparation continues, you will become more comfortable with the language and your Method of Reasoning prephrasing will improve. For example, note the use in this answer of “general rule” to describe the last sentence of the stimulus. The test makers could also have used a phrase like “basic principle” to achieve the same result. Your job is to match their language to what occurred in the stimulus.

Answer choice (D): This answer is an overgeneralization—a situation where one instance is used to make a broad based conclusion. This is a Reverse Answer since the stimulus actually uses a general principle and applies it to one instance. In addition, the language in the answer is far too strong in saying “all actions of a certain kind” when the language in the stimulus was probabilistic.

Answer choice (E): This is an Exaggerated Answer. The conclusion states that “Garbage in this neighborhood *probably* will not be collected until Thursday this week” and the use of “probably” is a clear and obvious indication that the author does not think the Thursday garbage pickup is inevitable.

Now try another. Please take a moment to complete the following problem:

2. Jane: Professor Harper’s ideas for modifying the design of guitars are of no value because there is no general agreement among musicians as to what a guitar should sound like and, consequently, no widely accepted basis for evaluating the merits of a guitar’s sound.

Mark: What’s more, Harper’s ideas have had enough time to be adopted if they really resulted in superior sound. It took only ten years for the Torres design for guitars to be almost universally adopted because of the improvement it makes in tonal quality.

Which one of the following most accurately describes the relationship between Jane’s argument and Mark’s argument?

- (A) Mark’s argument shows how a weakness in Jane’s argument can be overcome.
- (B) Mark’s argument has a premise in common with Jane’s argument.
- (C) Mark and Jane use similar techniques to argue for different conclusions.
- (D) Mark’s argument restates Jane’s argument in other terms.
- (E) Mark’s argument and Jane’s argument are based on conflicting suppositions.

First take a close look at the statements made by Jane and Mark.

Jane's position: Jane concludes that Professor Harper's ideas are valueless because there is no way to evaluate a guitar's sound and determine what constitutes a better-sounding guitar.

Mark's position: Mark also agrees that Professor Harper's ideas are valueless, but Mark's reasoning is that if Harper's ideas really worked, then they would have been adopted by now. In making this analysis, Mark reveals that he believes there is a way to determine that one guitar sounds better than another.

Like all GMAT questions, you must lock down the exact nature of the premises and conclusions! Mark's initial comment of "What's more" leads most people to believe he is in complete agreement with Jane. Yes, he agrees with her conclusion, but his reason for doing so is completely contrary to Jane's reason. Mark actually misinterprets Jane's claim, and this is why he says "What's more," as if he is adding an additional piece of information that supports her position. He is not—the premise that he uses contradicts Jane's premises. If you simply accept "What's more" to mean that he is in complete agreement with Jane, you will most certainly miss the question, and have no idea you have done so.

The problem becomes even more challenging because the answer choices are brilliantly constructed:

Answer choice (A): Mark does not address a weakness in Jane's argument or show how one could be overcome. Do not mistake the use of "What's more" to automatically mean that he is adding something helpful to the situation.

Answer choice (B): This is an answer chosen by many people, and it has Shell game aspects. Mark's argument does not have a *premise* in common with Jane's argument; rather, Mark's argument has the *conclusion* in common with Jane's argument.

Before you select this answer, use the Fact Test and ask yourself, "Which premise do the two arguments have in common?" You won't be able to find one, and that would instantly disprove the answer.

Answer choice (C): This is a very clever Reverse Answer choice. The answer states:

"Mark and Jane use *similar* techniques to argue for *different* conclusions."

In fact, the following happens in the stimulus:

“Mark and Jane use *different* techniques to argue for *similar* conclusions.”

If you had any doubt that the makers of the GMAT put the same amount of work into the wrong answers as the correct answers, this answer choice should convince you that they do.

Answer choice (D): An argument is the sum of the premises and conclusion. Although Mark restates Jane’s conclusion, he does not restate her premises. Therefore, he does not restate her argument and this answer is incorrect.

Answer choice (E): This is the correct answer. As discussed in the argument analysis, Jane believes that there is no way to evaluate the merit of a guitar’s sound. On the opposite side, Mark’s response indicates he believes that there is a way to evaluate the merit of a guitar’s sound (“because of the improvement it makes in tonal quality”) and thus the two have conflicting positions.

This is another great example of a separator question: one that scorers in a certain range will get and scorers in a lower range will not get. This is also a dangerous question because many people think they have chosen the correct answer when in fact they have missed it. The lesson here is that you must be an active, prepared reader. Do not allow yourself to be lulled by Mark’s comment of “What’s more” into believing that he automatically is in agreement with Jane. The test makers use that phrase to see if you will read closely enough to discern his real argument or if you will simply gloss over his comments on the basis of how they are introduced. The GMAT always makes you pay if you gloss over any section of a stimulus.

Method of Reasoning—Bolded Argument Part Questions

Argument Part (AP) questions are a very rare subset of Method of Reasoning questions. In Method-AP questions, the question stem cites a specific portion or portions of the stimulus and then asks you to identify the role the cited portion plays in the structure of the argument or about the role the two portions play in relation to each other. Here are several example question stems:

“The claim that inventors sometimes serve as their own engineers plays which one of the following roles in the argument?”

“The statement ‘thinking machines closely modeled on the brain are also likely to fail’ serves which one of the following roles in Yang’s argument?”

“In the argument above, the two **boldface** portions play which of the following roles?”

The answer choices in each problem then describe the structural role of the citation, often using terms you are already familiar with such as “premise,” “assumption,” and “conclusion.” At this point in the book, you are uniquely positioned to answer these questions because the Primary Objectives have directed you from the start to isolate the structure of each argument and to identify each piece of the argument. Method-AP questions reward the knowledge you naturally gain from this process.

Method-AP Stimulus Structure

The stimuli that accompany Method-AP questions tend to be more complex than the average GMAT stimulus. Some problems feature two conclusions (one is the main conclusion, the other is a subsidiary conclusion), and often the stimulus includes two different viewpoints or the use of counterpremises. Thus, the ability to identify argument parts using indicator words is important.

As you know from the discussion in Chapter Two, the order in which the conclusion and premises are presented is not relevant to the logical validity of the argument. Still, many people have difficulty becoming accustomed to arguments where the conclusion appears first, and we will discuss those arguments in a moment. Regardless, a large number of Method-AP problems feature the traditional formation with the conclusion at the end of the argument. If you do see the main conclusion at the end of a Method-AP problem, be prepared to answer a question about a part of the argument *other than* the conclusion. The test makers do this because they know students are very good at identifying the conclusion when it appears in the last sentence.

For more information on argument indicators, please review Chapter Two.

Please take a moment to complete the following problem:

3. Mayor: Some of my critics claim that the city's current budget deficit has been caused by my policies, and that I am responsible for the deficit. Although I admit that **the city has run a budget deficit during my tenure**, I do not agree that I am at fault for this problem. The economic policies of the prior administration caused the current deficit, and **were it not for the economic policies of my administration, the current deficit would be even worse.**

In the mayor's argument, the two boldface portions play which of the following roles?

- (A) The first is a premise that has been used against the mayor; the second supports the critics of the mayor.
- (B) The first is a statement accepted by the mayor; the second is a consequence of the critics' claims.
- (C) The first is a fact that the mayor believes does not contradict his conclusion; the second offers support in consideration of that conclusion.
- (D) The first is evidence of unlawful activity by the mayor; the second is evidence offered by the mayor to explain that activity.
- (E) The first is evidence that undermines the mayor's main position; the second is a statement that follows from that position.

The presence of Method-AP questions signals that the makers of the GMAT expect you to understand argument structure. At the same time, the presence of this question type indicates that many students are unable to do so. Amazingly, you can gain time and points on the GMAT simply by doing the very things you already learned in order to succeed on the test.

This argument begins with the classic “some of my critics claim” construction discussed in Chapter Two. As we know from that discussion, the conclusion of the argument will typically be the opposite of the claim. In this case, the conclusion comes in the second sentence when the mayor states the following:

Conclusion: I do not agree that I am at fault for this problem [the budget deficit].

Because neither bolded portion overlaps the conclusion, the bolded portions must be premises or counterpremises. Take a moment to go back and look at some of the indicator words—see the “although” just before the first bolded portion? The presence of that word means that the first bolded portion is given as a counterpremise to the author’s conclusion. That is, the mayor admits that there was a budget deficit, and this fact possibly undermines his or her argument in some way, but the mayor still believes that the conclusion is true despite this fact.

The second bolded portion comes after the conclusion and is used as a premise to support the conclusion. Thus, one bolded portion is a counterpremise, and the other is a premise, and the correct answer must reflect that fact.

In summary, the pertinent portions of the argument appear as follows:

- Critics claim: The critics claim that the mayor is responsible for the current budget deficit.
- Bolded portion: In this counterpremise the mayor admits that there is a budget deficit.
- Conclusion: The conclusion indicates that even though there is a budget deficit, the mayor is not responsible for the deficit, contrary to the claim of the critics.
- Bolded portion: This is a premise that indicates that the mayor’s economic policies have actually benefitted the city, not hurt the city.

A quick scan of the answer choices reveals that each will be broken into two parts: the first part will describe the first bolded section and the second part will describe the second bolded section.

Answer choice (A): The first half of this answer is a classic Contender. It may very well be that the counterpremise has been used against the mayor. Setting that aside, however, the description of the second bolded portion is inaccurate, and so this answer choice is incorrect.

Answer choice (B): This is classic Half-Right, Half-Wrong answer choice. The

If the use of premise/ conclusion identifier words fails to identify the main conclusion, then use the Conclusion Identification Method described in Chapter Two: use one statement as a conclusion and the other as a premise and see if the arrangement makes sense.

first bolded portion is a statement accepted by the mayor; however, it is not the case that the second bolded portion is a “consequence of the critics’ claims.”

Answer choice (C): This is the correct answer. In this case, although the mayor admits that the first bolded portion is true, he or she does not believe that fact has a negative impact on the conclusion.

Answer choice (D): This answer begins poorly because we do not know that the first boldface portion is evidence of unlawful activity by the mayor.

Answer choice (E): This is another answer where the first bolded portion causes many people to leave the answer as a Contender. However, the description of the second bolded portion is inaccurate because the second portion is not a consequence of the first bolded portion (this is a direct test of your ability to discern a premise from a conclusion).

A Common Wrong Answer

One trick used by the test makers in Method-AP questions is to create wrong answers that describe parts of the argument other than the part named in the question stem. These answers are particularly attractive because they do describe a part of the argument, just not the part referenced in the question stem. Before proceeding to the answer choices, make sure you know exactly what part of the argument you are being asked about.

Final Note

This chapter is the first of two chapters that focus on questions that are primarily structural in nature. In the next chapter we will discuss Parallel Reasoning, which is very structurally oriented

Method of Reasoning and Flaw in the Reasoning Question Type Review

Method of Reasoning questions require you to select the answer choice that best describes the method used by the author to make the argument. Structurally, Method of Reasoning questions are simply abstract Must Be True questions: instead of identifying the facts of the argument, you must identify the logical organization of the argument. The stimulus for a Method Reasoning question will contain an argument, and the argument can contain either valid or invalid reasoning.

Flaw in the Reasoning questions are exactly the same as Method of Reasoning questions with the important exception that the question stem indicates that the reasoning in the stimulus is flawed. Because the question stem reveals that a flaw is present, you need not make a determination of the validity of the stimulus.

As part of the First Family of Questions, Method and Flaw questions feature the following information structure:

1. You can use only the information in the stimulus to prove the correct answer choice.
2. Any answer choice that describes information or a situation that does not occur in the stimulus is incorrect.

You must watch for the presence of the premise and conclusion indicators discussed in Chapter Two.

Use the Fact Test to eliminate answers in Method and Flaw questions:

If an answer choice describes an event that did not occur in the stimulus, then that answer is incorrect.

Several types of incorrect answers regularly appear in Method and Flaw questions:

1. "New" Element Answers
2. Half Right, Half Wrong Answers
3. Exaggerated Answers
4. The Opposite Answer
5. The Reverse Answer

Method of Reasoning and Flaw in the Reasoning Question Type Review

Argument Part (AP) questions are a specific subset of Method of Reasoning questions. In Method-AP questions, the question stem cites a specific portion of the stimulus and then asks you to identify the role that the cited portion plays in the structure of the argument, or alternately the stem cites two portions of the stimulus and about the role the two portions play in relation to each other.

The stimuli that accompany Method-AP questions tend to be more complex than the average GMAT stimulus.

One trick used by the test makers in Method-AP questions is to create wrong answers that describe parts of the argument other than the part named in the question stem.

Method of Reasoning and Flaw in the Reasoning Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 231*

1. Jorge: You won't be able to write well about the rock music of the 1960s, since you were just an infant then. Rock music of the 1960s was created by and for people who were then in their teens and early twenties.

Ruth: Your reasoning is absurd. There are living writers who write well about ancient Roman culture, even though those writers are obviously not a part of ancient Roman culture. Why should my youth alone prevent me from writing well about the music of a period as recent as the 1960s?

Ruth responds to Jorge's criticism by

- (A) challenging his claim that she was not in her teens or early twenties during the 1960s
- (B) clarifying a definition of popular culture that is left implicit in Jorge's argument
- (C) using the example of classical culture in order to legitimize contemporary culture as an object worthy of serious consideration
- (D) offering an analogy to counter an unstated assumption of Jorge's argument
- (E) casting doubt on her opponent's qualification to make judgments about popular culture

2. Anne: Halley's Comet, now in a part of its orbit relatively far from the Sun, recently flared brightly enough to be seen by telescope. No comet has ever been observed to flare so far from the Sun before, so such a flare must be highly unusual.

Sue: Nonsense. Usually no one bothers to try to observe comets when they are so far from the Sun. This flare was observed only because an observatory was tracking Halley's Comet very carefully.

Sue challenges Anne's reasoning by

- (A) pointing out that Anne's use of the term "observed" is excessively vague
- (B) drawing attention to an inconsistency between two of Anne's claims
- (C) presenting evidence that directly contradicts Anne's evidence
- (D) offering an alternative explanation for the evidence Anne cites
- (E) undermining some of Anne's evidence while agreeing with her conclusion

Method/Flaw Problem Set

3. Seemingly inconsequential changes in sea temperature due to global warming eventually result in declines in fish and seabird populations. A rise of just two degrees prevents the vertical mixing of seawater from different strata. This restricts the availability of upwelling nutrients to phytoplankton. Since zooplankton, which feed upon phytoplankton, feed the rest of the food chain, the declines are inevitable.

Which one of the following most accurately describes the role played in the argument by the statement that zooplankton feed upon phytoplankton?

- (A) It is a hypothesis supported by the fact that phytoplankton feed on upwelling nutrients.
 - (B) It is intended to provide an example of the ways in which the vertical mixing of seawater affects feeding habits.
 - (C) It helps show how global temperature changes affect larger sea animals indirectly.
 - (D) It is offered as one reason that global warming must be curtailed.
 - (E) It is offered in support of the idea that global warming poses a threat to all organisms.
4. Cotrell is, at best, able to write magazine articles of average quality. The most compelling pieces of evidence for this are those few of the numerous articles submitted by Cotrell that are superior, since Cotrell, who is incapable of writing an article that is better than average, must obviously have plagiarized superior ones.

The argument is most vulnerable to criticism on which one of the following grounds?

- (A) It simply ignores the existence of potential counterevidence.
- (B) It generalizes from atypical occurrences.
- (C) It presupposes what it seeks to establish.
- (D) It relies on the judgment of experts in a matter to which their expertise is irrelevant.
- (E) It infers limits on ability from a few isolated lapses in performance.

5. Activist: Food producers irradiate food in order to prolong its shelf life. Five animal studies were recently conducted to investigate whether this process alters food in a way that could be dangerous to people who eat it. The studies concluded that irradiated food is safe for humans to eat. However, because these studies were subsequently found by a panel of independent scientists to be seriously flawed in their methodology, it follows that irradiated food is not safe for human consumption.

The reasoning in the activist's argument is flawed because that argument

- (A) treats a failure to prove a claim as constituting proof of the denial of that claim
- (B) treats methodological flaws in past studies as proof that it is currently not possible to devise methodologically adequate alternatives
- (C) fails to consider the possibility that even a study whose methodology has no serious flaws nonetheless might provide only weak support for its conclusion
- (D) fails to consider the possibility that what is safe for animals might not always be safe for human beings
- (E) fails to establish that the independent scientists know more about food irradiation than do the people who produced the five studies

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

Question #1. Method. The correct answer choice is (D)

The arguments of Jorge and Ruth can be analyzed as follows:

Jorge's Argument

- Premise: Rock music of the 1960s was created by and for people who were then in their teens and early twenties.
- Premise: You were just an infant then [in the 1960s].
- Conclusion: You won't be able to write well about the rock music of the 1960s.

Ruth's Argument

- Premise: There are living writers who write well about ancient Roman culture, even though those writers are obviously not a part of ancient Roman culture.
- Premise: Why should my youth alone prevent me from writing well about the music of a period as recent as the 1960s?
- Conclusion: Your reasoning is absurd.

Note that the question stem asks you to identify how Ruth responded. When two-speaker stimuli are combined with Method of Reasoning questions, you are typically asked to identify the reasoning of only one of the speakers (usually the second speaker). However, you must still understand the argument of the other speaker as the answer choices often refer to it.

Now let's use the answer choices to discuss the structure of the argument.

Answer choice (A): Ruth does not challenge Jorge's claim about her age. To the contrary, she seemingly admits he is correct when she says "Why should my youth alone..."

Answer choice (B): Although Ruth uses an example that cites culture, she does not clarify a definition of popular culture, and certainly not one left implicit in Jorge's argument.

Answer choice (C): This is a Half Right, Half Wrong answer. The first part of the answer choice—"using the example of classical culture"—does occur in Ruth's response, but she does not use that example "in order to legitimize contemporary culture as an object worthy of serious consideration."

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

Answer choice (D): This is the correct answer. An analogy is a comparison between two items. In argumentation, analogies are often used to clarify the relationship between the items or reveal a fundamental truth about one of the items, as in "To better understand the operating system of your computer, think of it as the *brain* of your system." The use of "brain" in the preceding sentence is the analogy.

Analogies can be used to challenge a position or support a position, but their strength often rests on the relevant similarities between the two items or scenarios. In the next chapter we will discuss False Analogies, where an author uses an analogy that is dissimilar enough to be nonapplicable.

As referenced in this answer choice, Ruth analogizes writing about Roman culture to writing about the 1960s to show that it is not unreasonable that someone who was an infant can write about that time period. Jorge's assumption is that if a person was not a teen or older during the 1960s, then they cannot write well about the music of that period. Since all elements described in the answer choice occur and the answer describes the method used by Ruth, this is the correct answer.

Answer choice (E): Ruth does not attack Jorge's qualification to make his argument, just his pronouncement that she will not be able to write well about the rock music of the 1960s.

Question #2. Method-CE. The correct answer choice is (D)

The stimulus in this problem appeared in Chapter Two as an example of a stimulus with two separate speakers (however, no analysis was given at that time).

The arguments of Anne and Sue can be analyzed as follows:

Anne's Argument

Premise: Halley's Comet, now in a part of its orbit relatively far from the Sun, recently flared brightly enough to be seen by telescope.

Premise: No comet has ever been observed to flare so far from the Sun before.

Conclusion: Such a flare must be highly unusual.

Sue's Argument

Premise: Usually no one bothers to try to observe comets when they are so far from the Sun.

Premise: This flare was observed only because an observatory was tracking Halley's Comet very carefully.

Conclusion: [Your conclusion is] Nonsense.

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

As is often the case with two-speaker stimuli, the speakers disagree. In this case, Anne uses causal reasoning to indicate that the cause of the sighting is unusual activity with Halley's comet:

FU = the flare is highly unusual

NCO = no comet has ever been observed to flare so far from the sun

C E

FU $\longrightarrow$ NCO

Sue counters by citing an alternate cause: no one has been looking for such a flare.

NO = no one bothers to try to observe comets when they are so far from the Sun

NCO = no comet has ever been observed to flare so far from the sun

C E

NO $\longrightarrow$ NCO

The problem now becomes an exercise in figuring out how the test makers will describe the alternative cause cited by Sue.

Answer choice (A): This answer quickly fails the Fact Test. Sue does not comment on the *use* of the term "observed" (other than to explain why the flare was observed).

Answer choice (B): Although Sue cites an explanation that is inconsistent with Anne's claim, she does not point out an *inconsistency between* two of Anne's claims

Answer choice (C): Remember, evidence is the same as premises. Does Sue contradict Anne's premises? No, she only contradicts her conclusion. Do not be drawn in by the word "nonsense." That word is used to attack the conclusion, not the premises of the argument.

Answer choice (D): This is the correct answer. In this answer, the alternate cause is described as an "alternative explanation." In most cases, a causal counterargument can be described as offering an alternative explanation.

Answer choice (E): This is a Reverse Answer. The answer appears as follows:

"undermining *some of Anne's evidence* while agreeing with *her conclusion*"

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

If the answer choice was reversed in the following manner, it would be correct:

“undermining *her [Anne’s] conclusion* while agreeing with *some of Anne’s evidence*”

The evidence she agrees with is the first sentence of Anne’s argument (the premise in the second sentence is not directly addressed).

Question #3. Method-AP, CE. The correct answer choice is (C)

The argument is structured as follows:

- Premise: A rise of just two degrees prevents the vertical mixing of seawater from different strata.
- Premise: This restricts the availability of upwelling nutrients to phytoplankton.
- Premise: Zooplankton, which feed upon phytoplankton, feed the rest of the food chain.
- Conclusion: Seemingly inconsequential changes in sea temperature due to global warming eventually result in declines in fish and seabird populations.

The conclusion in the first line is echoed again in the final sentence. The argument part referenced in the question stem is a premise (note the use of the premise indicator “since” in the last line), and your answer must indicate that the role played by the argument part is that of a premise.

Answer choice (A): The portion referenced in the question stem is not a hypothesis, but rather a statement of fact.

Answer choice (B): The statement referenced in the question stem is not an *example* of the way the mixing of seawater affects feeding habits, but rather another premise that is then combined with the vertical mixing premise to help support the conclusion.

Answer choice (C): This is the correct answer. The phrase “it helps show” describes a premise, and in this case the premise is used to support a statement about the effect of temperature changes on fish and seabirds.

Answer choice (D): The argument does not take a position that global warming should be curtailed. Instead, the argument shows how small changes in sea temperature lead to population declines, and no opinion of those effects is stated.

Answer choice (E): This is an Exaggerated Answer. The argument specifically indicates that fish and seabirds populations will decline. This answer choice states that *all* organisms are threatened.

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

Question #4. Flaw. The correct answer choice is (C)

As always, look closely at the structure of the argument—specifically the relationships between the premises and conclusion. This breakdown presents the pieces in the order given in the argument:

Conclusion: Cotrell is, at best, able to write magazine articles of average quality.

Subconclusion/

Premise: The most compelling pieces of evidence for this are those few of the numerous articles submitted by Cotrell that are superior.

Premise: Cotrell, who is incapable of writing an article that is better than average, must obviously have plagiarized superior ones.

Examine the language in the conclusion (“Cotrell is, at best, able to write magazine articles of average quality”) and the premise (“Cotrell, who is incapable of writing an article that is better than average”). The two are identical in meaning, and thus we have an argument with Circular Reasoning. In Circular Reasoning the author assumes as true what is supposed to be proved. Consider the following example:

“This essay is the best because it is better than all the others.”

In this example the premise and the conclusion are identical in meaning. As we know, the conclusion should always follow from the premise. In the example above, the premise supports the conclusion, but the conclusion equally supports the premise, creating a “circular” situation where you can move from premise to conclusion, and then back again to the premise, and so on. Here is another example: “I must be telling the truth because I’m not lying.”

Do not be distracted by the plagiarism argument in the middle of the text—that is a tool used to physically separate the conclusion and premise, making it harder to recognize that the two are identical.

Answer choice (A): The argument does not ignore the potential counterevidence to the conclusion. The potential counterevidence is the few articles submitted by Cotrell that are superior, and the author dismisses them by claiming they are plagiarized. Although the reasoning used to dismiss the good articles is flawed, it is an attempt to address the evidence, and thus the argument cannot be said to “simply ignore the existence of potential counterevidence.”

Answer choice (B): This answer choice describes an Overgeneralization. The answer is wrong because the argument generalizes by dismissing the atypical occurrences (the superior articles), as opposed to generalizing *from* them.

Answer choice (C): This is the correct answer, and one of several different ways to describe Circular Reasoning, which occurs when an author repeats the premises in the conclusion. More often than not, when you see Circular Reasoning it will be an incorrect answer choice, but you cannot be complacent and simply assume it will be wrong every time you see it. This problem proves that it does appear as the correct answer on occasion.

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

Answer choice (D): This answer fails the Fact Test because there is no reference to the judgment of experts.

Answer choice (E): This answer is similar to answer choice (B). The answer starts out reasonably well—"it infers limits on ability." The argument does attempt this (depending on your definition of "infer"). But, does the argument make this inference based on a "few isolated lapses in performance?" No, the argument *dismisses* the few superior performances. In this sense the answer is Half Right, Half Wrong. Therefore, it is incorrect.

Question #5. Flaw. The correct answer choice is (A)

The structure of the argument is as follows:

- Premise: Food producers irradiate food in order to prolong its shelf life.
- Premise: Five animal studies were recently conducted to investigate whether this process alters food in a way that could be dangerous to people who eat it. The studies concluded that irradiated food is safe for humans to eat.
- Premise: These studies were subsequently found by a panel of independent scientists to be seriously flawed in their methodology.
- Conclusion: Irradiated food is not safe for human consumption.

The author uses the fact that the studies were flawed to conclude that irradiated food is not safe for human consumption. Is this a reasonable conclusion? No. The studies purported to prove that irradiated food is safe. The fact that the studies used flawed methodology should have been used to prove that the studies did not prove that irradiated food was safe. Instead, the activist takes the argument too far, believing that because the studies did not prove that irradiated food is safe, therefore irradiated food is not safe. Answer choice (A) perfectly describes this mistake.

Answer choice (B): Use the Fact Test to easily eliminate this answer. Although past studies were shown to have methodological flaws, this evidence is not used to prove that methodologically sound alternatives are impossible to achieve.

Answer choice (C): It's true, the argument does fail to consider the possibility that a non-flawed study might provide only weak support for its conclusion. But—and this is the critical question—is that a flaw in the reasoning of the activist? No, it is perfectly acceptable for the author to ignore an issue (non-flawed studies) that does not relate to his argument. Remember, the correct answer choice must describe a *flaw* in the reasoning of the argument, not just something that occurred in the argument.

Method of Reasoning and Flaw in the Reasoning Problems Answer Key

Answer choice (D): As with answer choice (C), the author has failed to consider the statement in this answer choice. But is this a flaw? No. The fact that animal testing is widely done and the results are accepted as indicative of possible problems with humans falls under the “commonsense information” discussed back in Chapter Two. Testing products on animals is a current fact of life, and the author did not make a reasoning error by failing to consider the possibility that what is safe for animals might not always be safe for human beings.

Another way of looking at this answer is that it effectively states that the author has failed to consider that there is a False Analogy between animals and humans. He fails to consider it because the analogy between animals and humans is not false.

Answer choice (E): Again, the activist does fail to establish this, but it is not necessary since the independent scientists only commented on the methodology of the study, not the irradiated food itself.

C HAPTER ELEVEN: PARALLEL REASONING QUESTIONS

Parallel Reasoning Questions

Parallel Reasoning questions ask you to identify the answer choice that contains reasoning most similar in structure to the reasoning in the stimulus. Since this task requires you to first identify the method of argumentation used by the author and then to match that reasoning to the reasoning presented in each answer choice, these questions can be quite time consuming (a fact known to and exploited by the test makers).

Like Method of Reasoning and Flaw in the Reasoning questions, Parallel Reasoning questions are in the First Family and have the same information structure. However, because of the abstract nature of these questions, comparing the stimulus to the answer choices takes on a different dimension, and we will address this issue in a moment in the section entitled *Solving Parallel Reasoning Questions*.

Question stem examples:

“Which one of the following is most closely parallel in its reasoning to the reasoning in the argument above?”

“Which one of the following exhibits a pattern of reasoning most similar to that exhibited by the argument above?”

“Which one of the following arguments is most similar in its logical features to the argument above?”

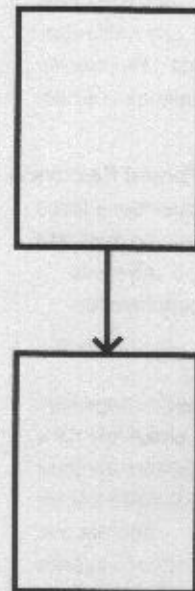
“Which one of the following arguments is most similar in its pattern of reasoning to the argument above?”

“The structure of the reasoning in the argument above is most parallel to that in which one of the following?”

Parallel Flaw Questions

The stimulus for a Parallel Reasoning question can contain either valid or invalid reasoning. When a Parallel Reasoning stimulus contains flawed reasoning, we identify it as a Parallel Flaw question. Like Flaw in the Reasoning questions, Parallel Flaw questions use many of the common forms of erroneous reasoning.

First Family
Information
Model:



Parallel Reasoning questions appear infrequently on the GMAT, but as with all the rare question types, they appear more frequently if you are doing well.

If the reasoning is flawed, the question stem will state that the reasoning is bad by using words such as "flawed" or "questionable."

Parallel Reasoning questions force you to evaluate six different arguments.

Here are two Parallel Flaw question stem examples. They are virtually identical to the previous Parallel Reasoning questions stems with the exception that they contain a term indicating that the reasoning in the stimulus is invalid:

"The flawed reasoning in which one of the following is most similar to the flawed reasoning in the argument above?"

"The questionable pattern of reasoning in the argument is most similar to that in which one of the following?"

The Peril of Abstraction

Parallel Reasoning questions are challenging because they are the most abstract type of question on the GMAT. Not only must you understand the structure of the argument in the stimulus, you must also understand the structure of the arguments in each of the five answer choices. Juggling all this abstract information is difficult, and you will learn how to effectively approach Parallel Reasoning questions in the following pages.

We will address several effective ways to handle the abstract nature of these questions, but first you must understand what approach *not* to take. Some companies recommend that you make general abstract diagrams for the elements in each stimulus and do the same for each answer choice. This "general symbolization" approach involves representing the premises and conclusion as "A," "B," "C," etcetera, and writing them next to the stimulus. This approach, while well-meaning, is hopelessly flawed. Parallel Reasoning questions are difficult *because* they involve a great deal of abstraction. The use of non-specific symbols such as "A," "B," and "C" further abstracts the stimulus elements, increasing the difficulty instead of alleviating it.

Please note that the method described above is different from the symbolization described in the causal reasoning chapter of this book. In that chapter, we recommend diagramming in response to specific logical formations, and we strongly recommend using symbols that directly represent elements in the stimulus. That approach, when properly used, makes the questions easier to attack.

Solving Parallel Reasoning Questions

Because you must find the answer with a similar pattern of reasoning to that in the stimulus, using the details of the stimulus to attack the answer choices works differently in Parallel Reasoning questions than in other First Family questions. For example, The Fact Test plays a minimal role in Parallel questions because the details (topic, etc.) of the stimulus and each answer choice are different. Instead, the structural basis of these questions forces you to compare the big-picture elements of the argument: intent of the conclusion, force and use of the premises, the relationship of the premises and the conclusion, and the soundness of the argument. Comparing these elements is like using an Abstract Fact Test—you must examine the general features of the argument in the answer choice and match them to the argument in the stimulus.

First, let us examine the elements of an argument that do *not* need to be paralleled in these questions:

1. Topic of the stimulus

In Parallel Reasoning questions, the topic or subject matter in the stimulus and the answer choices is irrelevant because you are looking for the argument that has a similar pattern of *reasoning*. Often, same-subject answer choices are used to attract the student who fails to focus on the reasoning in the stimulus. For example, if the topic of the stimulus is banking, you need not have an answer choice that is also about banking.

2. The order of presentation of the premises and conclusion in the stimulus

The order of presentation of the premises and conclusion in the stimulus is also irrelevant. As long as an answer choice contains the same general parts as the stimulus, they need not be in the same order because the order of presentation does not affect the logical relationship that underlies the pieces. So, for example, if the stimulus has an order of conclusion-premise-premise, you need not have the same order in the correct answer.

Neither of the elements above has any bearing on the correctness of an answer choice. Now, let's look at the elements that must be paralleled, and how to use these elements to eliminate wrong answer choices:

Parallel Reasoning questions are a continuation of Method of Reasoning questions: first you must identify the reasoning in the argument, and then you must find the answer with the same reasoning.

Answer choices with the same subject matter as the stimulus are almost always incorrect, and are generally used to lure students who fail to consider the reasoning in the stimulus. You should still consider answer choices with the same topic as the stimulus, but be wary.

1. The Method of Reasoning

It may sound obvious, but the type of reasoning used in the stimulus must be paralleled. When you see an identifiable form of reasoning present—for example, causal reasoning or conditional reasoning—you can proceed quickly and look for the answer that matches the form of the stimulus. Given the numerous forms of reasoning we have examined (both valid and invalid), you now have a powerful arsenal of knowledge that you can use to attack these questions. First and foremost, if you recognize the form of reasoning used in the stimulus, immediately attack the answers and search for the answer with similar reasoning.

2. The Validity of the Argument

The validity of the reasoning in the correct answer choice must match the validity of the reasoning in the stimulus.

Often, answer choices can be eliminated because they contain reasoning that has a different logical force than the stimulus. If the stimulus contains valid reasoning, eliminate any answer choice that contains invalid reasoning. If the stimulus contains invalid reasoning, eliminate any answer choice that contains valid reasoning.

3. The Conclusion

Every Parallel Reasoning stimulus contains an argument and therefore a conclusion. Because your job is to parallel the argument, you must parallel the subcomponents, including the premises and conclusion. You can use this knowledge to attack specific answer choices: if an answer has a conclusion that does not “match” the conclusion in the stimulus, then the answer is incorrect. Using this approach is especially helpful if you do not see an identifiable form of reasoning in the stimulus.

When matching conclusions, you must match the *certainty level* or *intent* of the conclusion in the stimulus, not necessarily the specific wording of the conclusion. For example, a stimulus conclusion containing absolutes (“must,” “never,” “always”) will be matched by a conclusion in the correct answer choice using similar absolutes; a stimulus conclusion that gives an opinion (“should”) will be matched by the same idea in the correct answer choice; a conditional conclusion in the stimulus will be matched by a conditional conclusion in the correct answer choice, and so on. This knowledge allows you to quickly narrow down the answer choices to the most likely candidates. This advice can initially be confusing, so let us discuss it in more detail.

Because Parallel Reasoning questions contain six different arguments, they are often lengthy.

First, answers that have identical wording to the conclusion are Contenders (assuming there is no other reason to knock them out of contention). Identical wording for our purposes means answers where the controlling modifiers (such as “must,” “could,” “many,” “some,” “never,” etcetera) are the same. For example, if the conclusion of the argument stated, “The reactor can supply the city power grid,” an answer that had similar wording, such as “The bank can meet the needs of customers,” would be a Contender. In brief, the advice in this paragraph is fairly simple: if the conclusion in the answer choice has similar wording to the conclusion in the stimulus, then the answer is *possibly* correct.

Second, because there are many synonyms available for the test makers to use, do not eliminate answers just because the wording is not identical. For example, an answer could state, “The majority of voters endorsed the amendment.” The quantity indicator in the sentence—“majority”—has several synonyms, such as “most” and “more than half.” Make sure that when you examine each sentence you do not eliminate an answer that has wording that is functionally identical to the wording in the stimulus.

Third, remember that the English language has many pairs of natural opposites, so the presence of a negative term in the stimulus is *not* grounds for dismissing the answer when the stimulus has positive language (and vice versa). For example, a conclusion could state, “The councilmember must be present at the meeting.” That conclusion could just as easily have been worded as, “The councilmember must not be absent from the meeting.” In the same way, an answer choice can use opposite language (including negatives) but still have a meaning that is similar to the stimulus.

If the stimulus has a positive conclusion, then the presence of negative terms in the conclusion is not grounds for eliminating the answer; if the stimulus has a negative conclusion, then the lack of a negative term in the conclusion is not grounds for eliminating the answer.

4. The Premises

Like the conclusion, the premises in the correct answer choice must match the premises in the stimulus, and the same wording rules that were discussed in *The Conclusion* section apply to the premises.

Matching premises is a step to take after you have checked the conclusion, unless you notice that one (or more) of the premises has an unusual role in the argument. If so, you can immediately look at the answer choices and compare premises.

Be wary of Parallel Flaw question stems that ask you to identify *both* the logical flaws in the stimulus. When this occurs, there is always an incorrect answer that contains only one of the flaws.

Because the four components above must be paralleled in the correct answer choice, the test makers have an array of options for making an answer *incorrect*. They can create answer choices that match several of the elements but not all of the elements, and to work through each answer choice in traditional fashion can be a painstaking process. However, since each element must be matched, you can analyze and attack the answer choices by testing whether the answer choice under consideration matches certain elements in the stimulus. If not, the answer is incorrect.

Upon hearing this advice, most students say, "Sounds good. In what order should I examine the elements?" Although the process can be reduced to a step-by-step procedure, a better approach is to realize that examining the elements is like a waterfall and that everything will happen very quickly. Performing well on the GMAT is about flexibility and correctly responding to the clues provided. Rigidly applying the methods below will rob you of the opportunity to accelerate through the problem. Therefore, in Parallel Reasoning questions your job is to identify the features of the argument most likely to be "points of separation"—those features that can be used to divide answers into Losers and Contenders. Sometimes matching the conclusion will knock out several answer choices, other times matching the premises will achieve that same goal. The following list outlines the four tests you can use to evaluate answers, in rough order of their usefulness:

This section of four tests for Parallel Reasoning questions describes the unique and original Elemental Attack™ used in all of the PowerScore GMAT Courses.

1. Match the Method of Reasoning

If you identify an obvious form of reasoning (use of analogy, circular reasoning, conditional reasoning, etc.), move quickly to the answer choices and look for the answer with an identical form of reasoning.

2. Match the Conclusion

If you cannot identify the form of reasoning, or if you still have two or more answer choices in contention after matching the reasoning, or if the conclusion seems to have unusual language, examine the conclusion of each answer choice and match it against the conclusion in the stimulus. Matching the conclusion can be a critical time-saver because it often eliminates one or more answers. On occasion, all five conclusions in the answer choices will be identical to that in the stimulus. That is not a problem—it just means that the other elements must be used to knock out the wrong answers.

The key to successfully matching the conclusion is that you must be able to quickly pick out the conclusion in each answer choice. This is where the conclusion identification skills discussed in Chapter Two come into play.

3. Match the Premises

If matching the method of reasoning and conclusion does not eliminate the four wrong answer choices, try matching the premises. The more complex the argument structure in the stimulus, the more likely you will have to match the premises to arrive at the correct answer. The less complex the argument, the more likely that matching the conclusion will be effective.

4. Match the Validity of the Argument

Always make sure to eliminate any answer choice that does not match the logical force (valid or invalid) of the argument. This test rarely eliminates all four answers, but it can often eliminate one or two answer choices.

Different methods can be used to eliminate different answers, and the process should be fluid and based on the signals you derive from the stimulus. This question required a combination of checking the reasoning, the conclusion, and the validity of the argument. Other problems will require different combinations. Remember that you have four basic tests at your disposal, and be prepared to use them when you encounter a Parallel Reasoning problem.

Parallel Reasoning

Decision time:

suppose you complete answer choice (A) and you are virtually certain that you have the correct answer. Should you read the remaining answer choices, or should you skip to the next problem? The answer, in part, depends on the time remaining in the section. If it is late in the section, most students are pressed for time and it would not be unreasonable to make a calculated choice to move on without reviewing answer choices (B) through (E). Before doing so, you would be well-advised to make sure that you are certain about the reasoning in the stimulus.

On the other hand, if this question were to appear early in the section, it would be worthwhile to quickly check the remaining answer choices because early in the section one of your goals is to accumulate as many correct answers as possible.

Please take a moment to complete the following problem:

1. No one in the French department to which Professor Alban belongs is allowed to teach more than one introductory level class in any one term. Moreover, the only language classes being taught next term are advanced ones. So it is untrue that both of the French classes Professor Alban will be teaching next term will be introductory level classes.

The pattern of reasoning displayed in the argument above is most closely paralleled by that in which one of the following arguments?

- (A) The Morrison Building will be fully occupied by May and since if a building is occupied by May the new tax rates apply to it, the Morrison Building will be taxed according to the new rates.
- (B) The revised tax code does not apply at all to buildings built before 1900, and only the first section of the revised code applies to buildings built between 1900 and 1920, so the revised code does not apply to the Norton Building, since it was built in 1873.
- (C) All property on Overton Road will be reassessed for tax purposes by the end of the year and the Elnor Company headquarters is on Overton Road, so Elnor's property taxes will be higher next year.
- (D) New buildings that include public space are exempt from city taxes for two years and all new buildings in the city's Alton district are exempt for five years, so the building with the large public space that was recently completed in Alton will not be subject to city taxes next year.
- (E) Since according to recent statute, a building that is exempt from property taxes is charged for city water at a special rate, and hospitals are exempt from property taxes, Founder's Hospital will be charged for city water at the special rate.

The structure of the stimulus is as follows:

- Premise: No one in the French department to which Professor Alban belongs is allowed to teach more than one introductory level class in any one term.
- Premise: Moreover, the only language classes being taught next term are advanced ones.
- Conclusion: So it is untrue that both of the French classes Professor Alban will be teaching next term will be introductory level classes.

The more complex the argument structure, the more important it is to match the premises. The more simple the argument, the more important it is to match the conclusion.

First note that the reasoning is valid. If you are uncertain, check the question stem.

Most people find that there is no clearly identifiable (or easily described) form of reasoning used to draw the conclusion, and each of the answer choices except (B) contains a conclusion with similar language to the conclusion in the stimulus. Thus, you must look elsewhere for the factor that separates the answer choices. Take a moment to consider each premise and how it relates to the conclusion; the argument is unusual in that both premises independently prove the conclusion, and this structure must be paralleled in the correct answer.

Now examine each premise:

- Premise: No one in the French department to which Professor Alban belongs is allowed to teach more than one introductory level class in any one term.

The premise contains two pieces of information: no one in the French department is allowed to teach more than one introductory level class and Professor Alban belongs to the French department. Combining those two pieces yields the conclusion that Professor Alban can teach at most one introductory level class in a term. This fact is reflected in the language of the conclusion.

- Premise: Moreover, the only language classes being taught next term are advanced ones.

If only advanced language classes are being taught next term, then no person could teach an introductory level French class next term. That truth is encompassed in the conclusion when the author states that "it is untrue that both of the French classes Professor Alban will be teaching next term will be introductory level classes."

Turning to the answers, you should look for the answer that has two independent premises that both prove the conclusion. Because there are two

premises, this “premise test” will take longer to apply and this is one reason we typically look at the conclusion in a Parallel Reasoning question before examining the premises.

Answer choice (A): This answer contains a conditional Repeat form, and as such, the two premises work together. Since the structure of the answer is different from that of the stimulus, the answer choice is incorrect.

Answer choice (B): Only the first premise in this answer choice proves the conclusion; the second premise is irrelevant to the conclusion. Therefore, this answer is incorrect.

As mentioned before, this answer choice is also suspect because the conclusion is different from that in the stimulus.

Answer choice (C): There are two excellent reasons to eliminate this answer choice:

1. The answer choice contains invalid reasoning.
2. The two premises work together and are not independent as in the stimulus.

Answer choice (D): This is the correct answer. As with the argument in the stimulus, each premise in this answer choice separately supports the conclusion.

Note that as mentioned previously, the negative term in the conclusion of the answer choice is not a factor that should be considered. For the purposes of matching the conclusion, “will be” and “will not be” are identical.

Answer choice (E): This answer is very similar to answer choice (A), and contains a valid form of reasoning based on the Repeat form. Since the two premises work together and neither proves the conclusion alone, this answer choice is incorrect.

This problem is difficult because you must go deeper in your analysis of the argument structure to find the point of separation. If you see that the reasoning is not easy to identify, and the conclusions in most of the answer choices are similar to the conclusion in the stimulus, carefully examine the premises as they are likely to be the part of the argument that will allow you to find the correct answer.

What To Do If All Else Fails

If none of the four tests of analysis reveals the answer, or if nothing stands out to you when you examine the argument, you can always fall back on describing the stimulus in abstract terms. Although less precise than the previous tests, abstracting the stimulus allows for one last shot at the problem.

To abstract the structure of the stimulus, create a short statement that summarizes the “action” in the argument without referring to the details of the argument. For example, if the argument states, “The bank teller had spotted a thief once before, so she was certain she could do it again,” turn that argument into an abstract description such as “she had done it once, so she knew it could be done again.” Then, take the abstraction and compare it to each argument. Does it match your generalized version of the stimulus? If not, the answer is incorrect. Your description should be a reasonable approximation of what occurred in the stimulus, but it does not have to be perfect.

In creating the abstraction above, the “it” in the short summary is purposely left indefinite so that when you attack the answer choices, you can plug in the “action” to the abstraction and see if it fits. Let’s continue the discussion of the basic method we can use to solve Parallel Reasoning problems. Please take a moment to complete the following problem:

2. An independent audit found no indication of tax avoidance on the part of the firm in the firm’s accounts; therefore, no such problem exists.

The questionable reasoning in the argument above is most closely paralleled by that in which one of the following?

- (A) The plan for the introduction of the new product has been unmodified so far; therefore, it will not be modified in the future.
- (B) The overall budget for the projects has been exceeded by a large amount; therefore, at least one of the projects has exceeded its budget by a large amount.
- (C) A compilation of the best student essays of the year includes no essays on current events; therefore, students have become apathetic toward current events.
- (D) A survey of schools in the district found no school without a need for building repair; therefore, the education provided to students in the district is substandard.
- (E) An examination of the index of the book found no listing for the most prominent critic of the theory the book advocates; therefore, the book fails to refer to that critic.

Here is another example of creating an abstract statement: if the argument states, “I nearly won the marathon several times so I have a good idea of how it feels to win the race,” turn that argument into an abstract description such as “I was close, so I know what it is really like.”

The question above was selected to help you better understand how to create an abstraction of the argument and apply it to the answer choices. Approach the question from the following perspective:

Imagine for a moment that when you first read the stimulus you were completely lost. Nothing in the argument stood out, and although you recognized the premise and conclusion, you did not feel that either was notable.

First, take the “action” of the stimulus and turn it into a generalized summary. Following is the stimulus and then an abstraction of that stimulus:

Stimulus: “An independent audit found no indication of tax avoidance on the part of the firm in the firm’s accounts; therefore, no such problem exists.”

Abstraction: “Since they looked and didn’t find anything, it doesn’t exist.”

Remember, our abstraction does not have to be perfect—it simply needs to be a reasonable description of what occurred in the stimulus. If we can only eliminate three of the answer choices by applying the abstraction, then we can refine our description until one of the remaining answers is eliminated.

Answer choice (A): Does this answer match our short description of the stimulus? No, this answer is about “no changes from the past translate into no changes in the future.” There is no element of “searching and not finding.”

Answer choice (B): Again, quickly, does this answer match our short description of the stimulus? No, this answer is about cost overruns on projects.

Answer choice (C): This answer is superior to answers (A) and (B). The first lines indicate that essays on current events are missing from a compilation of the best essays. This knowledge implies a search has taken place and no essay fitting the description was found. So far, so good. The conclusion, however, fails to match what we are seeking. Based on the premise in this answer choice, we need a conclusion that states something to the effect of, “therefore no such student essay on current events exists.” Instead, we get an entirely different type of conclusion: “therefore, students have become apathetic toward current events.” Since this conclusion fails to match our abstract description of the stimulus, this answer is incorrect.

Answer choice (D): This answer has an element that is similar to the stimulus, but in the final analysis it fails to match our abstract description. First, just like the stimulus, the answer contains a search (the “survey”). However, the search in the stimulus did not turn up anything whereas the search in answer choice (D) turns up results (“no school without a need” is the same as “every school

has a need"). Most damning, however, is that the conclusion of the answer choice does not have the same abstract form as the conclusion in the stimulus. Since the general intent and execution of this answer does not match our abstraction, this answer is incorrect.

Answer choice (E): This is the correct answer choice. First, let's revisit our general description of the stimulus:

"Since they looked and didn't find anything, it doesn't exist."

Now, compare that to the answer choice:

"An examination of the index of the book found no listing for the most prominent critic of the theory the book advocates; therefore, the book fails to refer to that critic."

A search was conducted but no results were found, and on that basis a conclusion is drawn that no such thing exists. This perfectly matches our description, and this answer is correct.

Creating an abstract description of the stimulus is just one more weapon in your arsenal. As with the previous four tests in this section, you should use it when you feel it is most applicable. Thinking on your feet is important when attacking any GMAT question, but never more so than with Parallel Reasoning questions. You have a variety of techniques at your disposal; you just need to logically think through each stimulus to decide which ones are most applicable.

Parallel Reasoning Question Review

Parallel Reasoning questions ask you to identify the answer choice that contains reasoning most similar in structure to the reasoning in the stimulus.

Parallel Flaw questions are Parallel Reasoning questions where the stimulus contains flawed reasoning.

The following elements do *not* need to be paralleled:

1. Topic of the stimulus
2. The order of presentation of the premises and conclusion in the stimulus

Instead, you must parallel *all* of these elements:

1. The Method of Reasoning
2. The Validity of the Argument
3. The Conclusion
4. The Premises

Because each element must be matched, you can analyze and attack the answer choices by testing whether the answer choice under consideration matches certain elements in the stimulus. If not, the answer is incorrect. The following list outlines the four tests you can use to evaluate answers, in rough order of how useful they are:

1. Match the Method of Reasoning
2. Match the Conclusion
3. Match the Premises
4. Match the Validity of the Argument

If all else fails, create a short statement that summarizes the “action” in the argument. Then, take the abstraction and compare it to each argument. Does it match your generalized version of the stimulus? If not, the answer is incorrect.

Parallel Reasoning Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 255*

1. The student body at this university takes courses in a wide range of disciplines. Miriam is a student at this university, so she takes courses in a wide range of disciplines.

Which one of the following arguments exhibits flawed reasoning most similar to that exhibited by the argument above?

- (A) The students at this school take mathematics. Miguel is a student at this school, so he takes mathematics.
- (B) The editorial board of this law journal has written on many legal issues. Louise is on the editorial board, so she has written on many legal issues.
- (C) The component parts of bulldozers are heavy. This machine is a bulldozer, so it is heavy.
- (D) All older automobiles need frequent oil changes. This car is new, so its oil need not be changed as frequently.
- (E) The individual cells of the brain are incapable of thinking. Therefore, the brain as a whole is incapable of thinking.

2. Commentator: Because of teacher hiring freezes, the quality of education in that country will not improve. Thus, it will surely deteriorate.

The flawed reasoning in which one of the following is most similar to that in the commentator's argument?

- (A) Because Raoul is a vegetarian, he will not have the pepperoni pizza for lunch. It follows that he will have the cheese pizza.
- (B) Given that over 250 years of attempts to prove the Goldbach conjecture have failed, it will probably never be proved. Hence, it is more likely to be disproved than proved.
- (C) Since funding levels for social programs are being frozen, our society will not become more harmonious. Thus, it may become more discordant.
- (D) Since there is a storm moving in, the outside temperature cannot rise this afternoon. Therefore, it must fall.
- (E) The starter in Mary's car gave out weeks ago, and so it is impossible for the car to start. Therefore, it will not start.

Parallel Reasoning Problem Set

3. Most people who shop for groceries no more than three times a month buy prepared frozen dinners regularly. In Hallstown most people shop for groceries no more than three times a month. Therefore, in Hallstown most people buy prepared frozen dinners regularly.

Which one of the following arguments has a flawed pattern of reasoning most like the flawed reasoning in the argument above?

- (A) It is clear that most drivers in West Anland are safe drivers since there are very few driving accidents in West Anland and most accidents there are not serious.
- (B) It is clear that John cannot drive, since he does not own a car and no one in his family who does not own a car can drive.
- (C) It is clear that Fernando's friends usually drive to school, since all of his friends can drive and all of his friends go to school.
- (D) It is clear that most people in Highland County drive sedans, since most people who commute to work drive sedans and most people in Highland County commute to work.
- (E) It is clear that most of Janine's friends are good drivers, since she accepts rides only from good drivers and she accepts rides from most of her friends.

Parallel Reasoning Question Problem Set Answer Key

Question #1. Parallel Flaw. The correct answer choice is (B)

The stimulus in this problem exhibits an error of division, where the attributes of the whole are taken to apply to each part of the whole. In this case, the whole is the university student body, and the part is Miriam. You must find an answer that contains a similar whole-to-part error of division.

As you attack the answers, it becomes apparent that answer choices (A) and (B) are Contenders and answer choices (C), (D), and (E) are Losers. We will first analyze (C), (D), and (E):

Answer choice (C): Unlike the stimulus, this answer choice contains valid reasoning and is therefore incorrect. If that fact escaped you during your analysis, this answer choice also reverses the relationship, moving from part to whole (the stimulus moves from whole to part).

Answer choice (D): This answer contains a error where both terms are mistakenly negated, not an error of division.

Answer choice (E): This answer choice contains an error of composition, where the attributes of the parts are mistaken for the attributes of the whole. This part-to-whole error is the reverse of the error in the stimulus.

Most students mark answer choice (A) as a definite possibility. Answer choice (B) also looks attractive, so look more closely at both in order to decide between them.

Answer choice (A): There are several points that differentiate the argument in this answer from the argument in the stimulus. First, the reasoning in this answer choice is valid, and that alone makes the answer incorrect. However, most students do not realize that the argument is valid; they are too caught up in analyzing the part-to-whole mechanics in the answer. Second, this answer has the same subject as the stimulus, always a red flag. Third, although it is similar in some ways to the argument in the stimulus, this answer choice focuses on a group where each member performs a single activity: the students take mathematics. If the students take mathematics and Miguel is a student, then he too would take mathematics. In the stimulus, the focus is on a group that *collectively* performs many activities—the students at the university “take courses in a wide range of disciplines.” Obviously, as a student at the school, Miriam does not have to take courses in different fields and she could stick to a narrow range of disciplines.

Answer choice (B): This is the correct answer. Like the stimulus, the focus is on a group that *collectively* performs many activities: the editorial board of the law journal has “written on many legal issues.” As a member of the editorial board, Louise need not write on many legal issues. Since the error is identical to that in the stimulus, this answer is correct.

Parallel Reasoning Question Problem Set Answer Key

Question #2. Parallel Flaw-CE. The correct answer choice is (D)

The commentator's argument is short and simple:

Premise: [There are] teacher hiring freezes.

Subconclusion/

Premise: The quality of education in that country will not improve.

Conclusion: Thus, it will surely deteriorate.

The argument has several notable elements:

The error in the argument occurs in the leap from subconclusion to conclusion: just because the quality of education will not improve does not necessarily mean it will deteriorate (it could stay the same). This mistake occurs because the author believes in the False Dilemma of two possible outcomes (that quality of education must either rise or fall) when there are actually three possible outcomes.

The argument also features a causal relationship in the first sentence: teacher hiring freezes are the cause of a lack of improvement in the quality of education.

The conclusion features strong and definite language—"will surely." An answer choice that deviates from this level of certainty will be incorrect.

With three distinct elements to work with, this problem should be easy to solve. The challenge is in deciding which element to attack first. Try to match the conclusion first because it will be the easiest (and therefore fastest) element to identify in each answer choice:

Answer choice (B) and (C) can be eliminated because they contain conclusions—"more likely" and "may," respectively—that are different than "will." Answer choice (A) has the same conclusion and remains a Contender. Be careful with answer choice (D) because the conclusion—"must"—is similar in certainty to "will surely." The conclusion of answer choice (E), "will not," remains in contention because the negative has no effect.

With only three remaining answer choices, let's next match the False Dilemma that underlies the conclusion:

Answer choice (A) seemingly relies on a similar assumption to that in the stimulus (that if one outcome does not occur then it must be the opposite outcome), but answer choice (A) is different from the stimulus because there are many different options for pizza, not just three.

Answer choice (D) is the correct answer. Each element is matched, and a False Dilemma is used that assumes that temperatures cannot stay the same.

Parallel Reasoning Question Problem Set Answer Key

Answer choice (E) is incorrect because the conclusion is identical to the premise: “impossible for the car to start” is the same as “it will not start.”

Question #3. Parallel Flaw. The correct answer choice is (D)

The structure of the argument is very distinct: the two premises and conclusion each contain the quantity indicator “most.” That structure must be paralleled in the correct answer choice, and you would be wise to immediately check the answers upon recognizing the triple “most” formation. Let us do so now:

Answer choice (A): The second line of the answer choice contains the phrase “very few.” Since this is different from “most,” this answer is incorrect.

Answer choice (B): The answer choice contains the phrases “cannot” and “no one,” both of which are different than “most.”

Answer choice (C): The phrase “usually” is a synonym for “most,” but the two “all” statements are different enough to make this answer choice suspect.

Answer choice (D): This is the correct answer, and the only one with three “mosts.”

Answer choice (E): The second line contains a conditional premise (introduced by “only”). Since the argument does not contain a similar premise, this answer is incorrect.

Amazingly, the application of this basic structural element solves the problem very quickly. The question itself represents a perfect example of how you should attack Parallel Reasoning questions: search for the most distinctive element, then use that element to eliminate as many answer choices as possible. You will not always be lucky enough to eliminate all four incorrect answer choices at once, but any answer you eliminate puts you one step closer to your goal.

For the record, the argument makes an error of division in assuming that a general proposition about “most people” will apply to any subset of that group. In this case, “most people who shop for groceries” could be about the entire United States, and within this group there could be towns and cities such as Hallstown that do not conform to the general truth that applies to the whole.

C

CHAPTER TWELVE: NUMBERS AND PERCENTAGES

Numbers and Percentages

Like Cause and Effect Reasoning, the concept of Numbers and Percentages is featured in many GMAT stimuli. Although most people are comfortable working with numbers or percentages because they come up so frequently in daily life (for example in balancing a checking account, dividing a bar tab, or adding up a grocery bill), the makers of the GMAT often prey upon several widely-held misconceptions:

Misconception #1: Increasing percentages automatically lead to increasing numbers.

Most people assume that if a percentage becomes larger, the number that corresponds to that percentage must also get larger. This is not necessarily true because the overall size of the group under discussion could get smaller. For example, consider the following argument: "Auto manufacturer X increased their United States market share from 10% last year to 25% this year. Therefore, Company X sold more cars in the United States this year than last." This is true if the size of the U.S. car market stayed the same or became larger. But if the size of the U.S. car market decreased by enough, the argument would not be valid, as in the following example:

	<u>Last Year</u>	<u>This Year</u>
Total number of cars sold in the United States	1000	200
X's market share	10%	25%
X's total car sales in the United States	100	50

Thus, even though auto manufacturer X's market share increased to 25%, because the size of the entire market decreased significantly, X actually sold fewer cars in the United States.

When identifying problems that contain numbers or percentages as part of the reasoning, we use a "#%" notation, as in "Must-#%."

Of course, if the overall total remains constant, an increasing percentage does translate into a larger number. But on the GMAT the size of the total is usually not given.

If the percentage increases but the corresponding number decreases, then the overall total must have decreased.

If the percentage decreases but the corresponding number increases, then the overall total must have increased.

Misconception #2: Decreasing percentages automatically lead to decreasing numbers.

This misconception is the opposite of Misconception #1. Just because a percentage decreases does not necessarily mean that the corresponding number must become smaller. Reversing the years in the previous example proves this point.

Misconception #3: Increasing numbers automatically lead to increasing percentages.

If the number increases but the corresponding percentage decreases, then the overall total must have increased.

Just as increasing percentages do not automatically translate into increasing numbers, the reverse is also true. Consider the following example: "The number of bicycle-related accidents rose dramatically from last month to this month. Therefore, bicycle-related accidents must make up a greater percentage of all road accidents this month." This conclusion can be true, but it does not have to be true, as shown by the following example:

	<u>Last Month</u>	<u>This Month</u>
Number of bicycle-related accidents	10	30
Total number of road accidents	100	600
Percentage of total accidents that are bicycle-related	10%	5%

Thus, even though the number of bicycle-related accidents tripled, the percentage of total road accidents that were bicycle-related dropped because the *total number* of road accidents rose so dramatically.

Misconception #4: Decreasing numbers automatically lead to decreasing percentages.

If the number decreases but the corresponding percentage increases, then the overall total must have decreased.

This misconception is the opposite of Misconception #3. Just because a number decreases does not necessarily mean that the corresponding percentage must become smaller. Reversing the months in the previous example proves this point.

Misconception #5: Large numbers automatically mean large percentages, and small numbers automatically mean small percentages.

In 2003, Porsche sold just over 18,000 cars in the United States. While 18,000 is certainly a large number, it represented only about 1/5 of 1% of total U.S. car sales in 2003. Remember, the size of a number does not reveal anything about the percentage that number represents unless you know something about the size of the overall total that number is drawn from.

Misconception #6: Large percentages automatically mean large numbers, and small percentages automatically mean small numbers.

This misconception is the reverse of Misconception #5. A figure such as 90% sounds impressively large, but if you have 90% of \$5, that really isn't too impressive, is it?

Numerical situations normally hinge on three elements: an overall total, a number within that total, and a percentage within the total. GMAT problems will often give you one of the elements, but without at least two elements present, you cannot make a definitive judgment about what is occurring with another element. When you are given just percentage information, you cannot make a judgment about numbers. Likewise, when you are given just numerical information you cannot make a judgment about percentages.

In a moment, we will explore this idea by examining several GMAT questions. But first, you must be able to recognize number and percentage ideas when they appear on the GMAT:

Words used to introduce numerical ideas:

Amount
Quantity
Sum
Total
Count
Tally

Knowledge of a percentage is insufficient to allow you to make a determination about the size of the number because the exact size of the overall total is unknown, and changes in the overall total will directly affect the internal numbers and percentages.

The makers of the GMAT know that numbers and percentages, like science-oriented topics, tend to confuse and frustrate test takers. By knowing the misconceptions that the test makers prey upon, you can turn these questions into quick and easy triumphs.

Words used to introduce percentage ideas:

Percent
Proportion
Fraction
Ratio
Incidence
Likelihood
Probability
Segment
Share

Three words on the percentage list—"incidence," "likelihood," and "probability"—bear further discussion. Each of these words relates to the chances that an event will occur, and when the GMAT makers uses phrases such as "more likely" or "less likely" they are telling you that the percentage chances are greater than 50% or less than 50%, respectively. In fact, a wide variety of phrases can be used to introduce percentage ideas, including such disparate phrases as "more prone to" or "occurs with a high frequency."

With these indicators in mind, please take a moment to complete the following question:

1. From 1973 to 1989 total energy use in this country increased less than 10 percent. However, the use of electrical energy in this country during this same period grew by more than 50 percent, as did the gross national product—the total value of all goods and services produced in the nation.

If the statements above are true, then which one of the following must also be true?

- (A) Most of the energy used in this country in 1989 was electrical energy.
- (B) From 1973 to 1989 there was a decline in the use of energy other than electrical energy in this country.
- (C) From 1973 to 1989 there was an increase in the proportion of energy use in this country that consisted of electrical energy use.
- (D) In 1989 electrical energy constituted a larger proportion of the energy used to produce the gross national product than did any other form of energy.
- (E) In 1973 the electrical energy that was produced constituted a smaller proportion of the gross national product than did all other forms of energy combined.

Like the vast majority of Must Be True problems, the stimulus does not contain a conclusion. We are given the following facts, however:

From 1973 to 1989 total energy use increased less than 10%.

During this same period, the use of electrical energy grew by more than 50%.

During this same period, the gross national product (GNP) grew by more than 50%.

A careful examination of the second sentence reveals that there is no stated connection between the growth of the GNP and the increase in the use of electrical energy. If you assume that the use of electrical energy somehow caused the growth of the GNP, you are guilty of making an unwarranted causal assumption. Because there is no stated connection between the two other than they both grew by more than 50%, any answer that attempts to connect the two is incorrect. Answer choices (D) and (E) can both be eliminated by this reasoning.

Now that we recognize that the GNP issue is only a red herring, let us examine the percentages that are given in the stimulus. The 50% increase in electrical energy gives the impression that the jump must have been substantial. But we know from Misconception #6 that a large percentage does not automatically mean a large number. For example, in this problem it is possible that the 50% increase in electrical energy use was a jump from 2 units to 3 units. The possibility that electrical energy use in 1973 was a relatively small percentage of overall energy use directly undermines answer choices (A), as shown by the following example:

	<u>1973</u>	<u>1989</u>
Total energy use (in units)	100	109
Electrical energy use (in units)	10	15
Percentage of total energy use that was electrical	10%	13+%

A close analysis of the chart also reveals that answer choice (B) can be eliminated. In the example, the use of energy other than electrical energy rose from 90 units to 94 units.

Although the example disproves answer choices (A) and (B), obviously you do not have time to make a chart during the test to examine each possibility, so is

there a faster way to eliminate the first two answers? Yes—consider the previous discussion point that information about percentages does not tell us about the numbers. With that idea in mind, because the stimulus contains only percentage information (even though there are two percentages), you should be very suspicious of answer choice (A) (which states that the number of electrical units used was greater) and answer choice (B) (which states that the use of non-electrical energy declined) since they both contain numerical information. At the same time, you should be attracted to an answer such as (C) because it contains only percentage information, and as it turns out, answer choice (C) is correct.

Because the misconceptions discussed earlier have a predictable effect when you try to make inferences, you can use the following general rules for Must Be True questions:

1. If the stimulus contains percentage or proportion information only, avoid answers that contain hard numbers.

Example Stimulus Sentence:

The car market share of Company X declined this year.

Avoid answers which say:

Company X sold a smaller number of cars this year.

Company X sold a greater amount of cars this year.

2. If the stimulus contains only numerical information, avoid answers that contain percentage or proportion information.

Example Stimulus Sentence:

Company Y sold fewer computers this year.

Avoid answers which say:

Company Y now has a lower share of the computer market.

Company Y now possesses a greater proportion of the computer market.

3. If the stimulus contains both percentage and numerical information, any answer choice that contains numbers, percentages, or both *may* be true.

The rules to the right address the classic combination of a stimulus with numbers and percentages information and a Must Be True question.

Please keep in mind that these rules are very general. You must read the stimulus closely and carefully to determine exactly what information is present because the makers of the GMAT are experts at camouflaging or obscuring important information in order to test your ability to understand complex argumentation.

Please take a moment to complete the following question:

2. The number of North American children who are obese—that is, who have more body fat than do 85 percent of North American children their age—is steadily increasing, according to four major studies conducted over the past 15 years.

If the finding reported above is correct, it can be properly concluded that

- (A) when four major studies all produce similar results, those studies must be accurate
- (B) North American children have been progressively less physically active over the past 15 years
- (C) the number of North American children who are not obese increased over the past 15 years
- (D) over the past 15 years, the number of North American children who are underweight has declined
- (E) the incidence of obesity in North American children tends to increase as the children grow older

Like the previous question, this is a Must Be True question with a stimulus that does not contain a conclusion. But, this stimulus does provide information about both the numbers and percentages of obese children, and so you can end up with an answer that has either a number or a percentage (though a numerical answer is more likely since the percentage is fixed at a constant 15% in the stimulus).

The numerical information comes from the phrase, “The number of North American children who are obese...is steadily increasing.” The percentage information comes from the phrase, “children who are obese—that is, who have more body fat than do 85 percent of North American children their age.” The percentage information defines obese children as those who fall into the top 15% among all children their age in terms of body fat, and therefore the percentage is known to be constant. The numerical information tells us that the actual number of obese children is increasing (and since this is a Must Be True question we can accept that information as accurate).

Answer choice (A): This answer is incorrect because there is no evidence in the stimulus to support it. Although the stimulus mentioned four major studies that apparently agreed about the increase in the number of obese children, it would be an exaggeration to say that any time four major studies produce similar results they *must* be accurate.

Answer choice (B): This answer proposes a causal reason for why the number of obese children is growing. From the information in the stimulus we cannot determine the cause of the rise in obesity, so answer choice (B) is also wrong.

Answer choice (C): This is the correct answer. Consider the following example:

15 years ago—100 total children of similar age

Number of obese children	15	= 15%
Number of non-obese children	85	

Now, let us say that the number of obese children has risen to 150 children today:

Today

Number of obese children	150
--------------------------	-----

So far we have conformed to the information given in the stimulus: the actual number of obese children is rising. However, although the number of obese children has now risen to 150, the definition of obesity (“more body fat than 85 percent of North American children”) remains unchanged. Since this is the case, the 150 obese children today must still comprise the top 15% of the total child population. Consequently, the remaining 85% of non-obese children must now be 850:

Today

Number of non-obese children	850
------------------------------	-----

(150 is 15% of 1000, and thus 85% of 1000 is 850)

Answer choice (C) is fully supported because the stimulus provides information about both the number and percentage of obese children. As stated earlier, if the stimulus provides information about both the numbers and percentages in a situation, then you can select any supported answer choice that contains either numbers or percentages. Note the emphasis on the word “supported.” In the obesity problem, GMAC could easily have written an *incorrect* answer choice that says, “The number of North American children who are not obese *decreased* over the past 15 years.”

Answer choice (D): This answer addresses “underweight” children, who are neither defined nor discussed in the stimulus.

Answer choice (E): This answer is directly contradicted by the information in the stimulus, which states that the incidence of obesity is definitionally set at a constant 15%.

Both of the previous questions were Must Be True questions, but of course the makers of the GMAT can also ask other questions about a stimulus that contains numbers and percentages. Please take a moment to consider the following problem:

3. Waste management companies, which collect waste for disposal in landfills and incineration plants, report that disposable plastics make up an ever-increasing percentage of the waste they handle. It is clear that attempts to decrease the amount of plastic that people throw away in the garbage are failing.

Which one of the following, if true, most seriously weakens the argument?

- (A) Because plastics create harmful pollutants when burned, an increasing percentage of the plastics handled by waste management companies are being disposed of in landfills.
- (B) Although many plastics are recyclable, most of the plastics disposed of by waste management companies are not.
- (C) People are more likely to save and reuse plastic containers than containers made of heavier materials like glass or metal.
- (D) An increasing proportion of the paper, glass, and metal cans that waste management companies used to handle is now being recycled.
- (E) While the percentage of products using plastic packaging is increasing, the total amount of plastic being manufactured has remained unchanged.

The structure of the argument, in simplified form, is as follows:

Premise: Disposable plastics make up an ever-increasing percentage of the waste they handle.

Conclusion: Attempts to decrease the amount of plastic that people throw away in the garbage are failing.

Based on our discussion of numbers and percentages, it should be clear that the conclusion is flawed: a numbers conclusion ("amount") cannot be drawn solely from percentage information because the overall total could change dramatically. As you attack the answer choices, look for an answer that addresses this error.

Answer choice (A): The argument is about how people act when throwing away garbage, an issue that occurs before the waste management companies receive the trash. On the other hand, this answer discusses how the waste management companies dispose of plastics, an issue that occurs after they have received the waste. Because the two issues occur at different times in the cycle, this answer does not attack the argument and is incorrect.

Answer choice (B): Like answer choice (A), this answer raises an issue that occurs *after* the waste management companies have received the waste.

Answer choice (C): This answer addresses how people act prior to throwing away garbage, but it does not suggest that the amount of plastic that people throw away is not decreasing. The author would probably counter this statement by saying that regardless of the fact that people are more likely to save plastic containers, that tendency is only relative to glass and metal containers, and people are still throwing away plastics in an ever-increasing percentage (and thus amount).

Answer choice (D): This is the correct answer. The answer indicates that the waste management companies no longer receive as much paper, glass, and metal as they used to. Since this clearly affects the amount of trash that they process, this would also affect the percentages of each type of waste. If the amount of paper, glass, and metal drops by a large amount, the percentage of plastic in the waste would rise even if the actual amount of plastic waste was reduced. The following example shows how this is possible:

	Previously	Now
Total garbage (in units)	100	20
Plastic garbage (in units)	20 (20%)	10 (50%)
Other garbage (in units)	80 (80%)	10 (50%)

In the example, plastic garbage has risen from 20% to 50%, but the actual amount of plastic waste has decreased from 20 units to 10 units. Consequently, because this answer raises a scenario that could disprove the argument, it is the correct answer.

Answer choice (E): The amount of plastic being manufactured is not the issue in the stimulus; how much plastic is thrown away is the issue.

In all respects this is a classic numbers and percentages Weaken problem. Accordingly, we can use this discussion to highlight a general rule for handling Weaken and Strengthen questions paired with numbers and percentages stimuli:

To weaken or strengthen an argument containing numbers and percentages, look carefully for information about the total amount(s)—does the argument make an assumption based on one of the misconceptions discussed earlier?

On the following page, another numbers and percentage problem is presented.

Please take a moment to complete the following question.

4. For next year, the Chefs' Union has requested a 10 percent salary increase for each of its members, whereas the Hotel Managers' Union has requested only an 8 percent salary increase for each of its members. These facts demonstrate that the average dollar amount of the raises that the Chefs' Union has requested for next year is greater than that of the raises requested by the Hotel Managers' Union.

Which one of the following, if true, most strengthens the argument?

- (A) The Chefs' Union has many more members than does the Hotel Managers' Union.
- (B) The Chefs' Union is a more powerful union than is the Hotel Managers' Union and is therefore more likely to obtain the salary increases it requests.
- (C) The current salaries of the members of the Chefs' Union are, on average, higher than the current salaries of the members of the Hotel Managers' Union.
- (D) The average dollar amount of the raises that the members of the Chefs' Union received last year was equal to the average dollar amount of the raises that the members of the Hotel Managers' Union received.
- (E) The members of the Chefs' Union received salary increases of 10 percent in each of the last two years, while the members of the Hotel Managers' Union received salary increases of only 8 percent in each of the last two years.

This problem makes the classic mistake of assuming that a larger percentage translates into a greater number (Misconception #6). According to the argument, because the Chef's Union requested a 10% raise and the Hotel Manager's Union requested only an 8% raise, the Chef's Union must have asked for more money than the Hotel Manager's Union. But, the argument never tells us how much the average member of each union makes, so the conclusion cannot be drawn with certainty, as shown by the following example:

	<u>Chef</u>	<u>Hotel</u>
Raise request	10%	8%
Average current salary	\$1000	\$10,000
Actual amount of raise requested	\$100	\$800

Even though the Chef's Union has asked for a greater percentage raise than the Hotel Manager's Union, it is still possible that the actual dollar amount of the Hotel Manager's Union request is greater. In this case, omitting the average current salary made by each member is tantamount to omitting the *total amount* made by the members, and thus, even though this problem uses averages, it trades on the mistake behind all the misconceptions discussed at the beginning of this chapter. To strengthen the argument, you must find an answer that indicates that the Chef's Union has a wage that is equal to or greater than the wage of the Hotel Manager's Union (the wage could also be very slightly below that of the Hotel Manager's Union).

Answer choice (A): Because the conclusion is specific about the average dollar amount requested, and an average can be calculated regardless of how many members are in the union, this answer is irrelevant to the argument.

Answer choice (B): The argument focuses on the size of each Union's raise request. Whether each union will receive the request is not at issue, and thus this answer is incorrect.

Answer choice (C): This is the correct answer. As discussed above, an answer that indicates that the Chef's Union has a wage that is equal to or greater than the wage of the Hotel Manager's Union would strengthen the argument. This is the answer you should look for when you read the question stem, and you should attempt to accelerate through the answer choices to find this answer.

Answer choice (D): This answer refers to the raises given out last year. Unfortunately, this fails to address the current salaries of the union members.

Answer choice (E): Like answer choice (D), this answer addresses previous raises, which does not tell us about current salaries.

Averages appear in a variety of GMAT questions. Just remember, an average is a composite number, and within the average there can be a significant degree of variation and no single entity need embody the exact characteristic of the average (for example, the average weight of a 1 pound rock and a 99 pound rock is 50 pounds).

Answer choices (D) and (E) attempt to lure you into the same mistake made by the author in the stimulus.

Markets and Market Share

The makers of the GMAT expect you to understand the operation of markets and the concept of market share. Market operation includes supply and demand, production, pricing, and profit. None of these concepts should be unfamiliar to you as they are a routine part of business.

Market share is simply the portion of a market that a company controls. The market share can be measured either in terms of revenues (sales) or units sold. For example:

Heinz has a 60% market share of the \$500 million ketchup market.

Jif brand peanut butter sold 80 million units last year, a 30% market share.

Because market share is a numbers and percentages concept, market share can change when factors in the market change. For example, a company can gain market share (percentage) if the market shrinks and they maintain a constant size, or if they grow in an unchanging market. However, a company losing market share does not mean that their sales decreased, only that they became a smaller entity in the market relative to the whole (for example, the market grew and they stayed the same size). Similarly, a company could lose sales and still gain market share if the overall market became smaller.

Regardless of the size of a market and even though the total amount of the market can shift, the total market share must always add up to 100%.

Please take a moment to complete the following question:

5. Rumored declines in automobile-industry revenues are exaggerated. It is true that automobile manufacturers' share of the industry's revenues fell from 65 percent two years ago to 50 percent today, but over the same period suppliers of automobile parts had their share increase from 15 percent to 20 percent and service companies (for example, distributors, dealers, and repairers) had their share increase from 20 percent to 30 percent.

Which one of the following best indicates why the statistics given above provide by themselves no evidence for the conclusion they are intended to support?

- (A) The possibility is left open that the statistics for manufacturers' share of revenues come from a different source than the other statistics.
- (B) No matter what changes the automobile industry's overall revenues undergo, the total of all shares of these revenues must be 100 percent.
- (C) No explanation is given for why the revenue shares of different sectors of the industry changed.
- (D) Manufacturers and parts companies depend for their revenue on dealers' success in selling cars.
- (E) Revenues are an important factor but are not the only factor in determining profits.

The conclusion of the argument states that the rumored declines in automobile-industry revenues are exaggerated (a numerical statement), but the premises provided in support of this argument only address the market share percentages of the three groups that have automobile-industry revenues (percentage statements). The percentage statements used by the author only indicates that the percentages have changed, not whether overall revenue has changed:

	<u>2 Years Ago</u>	<u>Today</u>
Manufacturers' share	65%	50%
Suppliers' share	15%	20%
Service companies' share	20%	30%
Total market size in %	100%	100%

Although the composition of the market has changed in terms of the market share of each group, this fact tells us nothing about industry revenues because market shares will always add up to 100% regardless of the actual dollars involved. Thus, automobile-industry revenues could have fallen dramatically and the percentages above could still be accurate.

Answer choice (A): Although it is true that the possibility is left open that the statistics for the manufacturers' share may come from a different source, this does not address the fundamental percentage-to-number error in the argument.

Answer choice (B): This is the correct answer. The answer reveals the error of the author: the changing market shares of different groups have no impact on the actual amount of revenues. In all instances, the market shares will add up to 100%, so a discussion of shifts within this 100% is meaningless as far as making a determination of whether revenues declined.

Answer choice (C): This is not a flaw of the argument. The author is allowed to simply note that the shares changed and use those facts to draw a conclusion. In the argument the conclusion is faulty, but not for the reason cited in this answer.

Answer choice (D): The interrelationship of the groups named in the stimulus is not an issue in determining whether the conclusion is in error.

Answer choice (E): The argument is about revenues, and information about profits will not describe the error in the reasoning.

Numbers and Percentages Review

The makers of the GMAT often prey upon several widely-held misconceptions:

- Misconception #1: Increasing percentages automatically lead to increasing numbers.
- Misconception #2: Decreasing percentages automatically lead to decreasing numbers.
- Misconception #3: Increasing numbers automatically lead to increasing percentages.
- Misconception #4: Decreasing numbers automatically lead to decreasing percentages.
- Misconception #5: Large numbers automatically mean large percentages, and small numbers automatically mean small percentages.
- Misconception #6: Large percentages automatically mean large numbers, and small percentages automatically mean small numbers.

Words that introduce numerical ideas:

Amount
Quantity
Sum
Total
Count
Tally

Words that introduce percentage ideas:

Percent
Proportion
Fraction
Ratio
Incidence
Likelihood
Probability
Segment
Share

Use the following general rules for Must Be True questions:

1. If the stimulus contains percentage or proportion information only, avoid answers that contain hard numbers.
2. If the stimulus contains only numerical information, avoid answers that contain percentage or proportion information.
3. If the stimulus contains both percentage and numerical information, any answer choice that contains numbers, percentages, or both *may* be true.

Use the following general rules for Weaken and Strengthen questions:

To weaken or strengthen an argument containing numbers and percentages, look carefully for information about the total amount(s)—does the argument make an assumption based on one of the misconceptions discussed earlier?

Market share is simply the portion of a market that a company controls. Market share can be measured either in terms of revenues (sales) or units sold. Regardless of the size of a market, total market share must always add up to 100%.

Numbers and Percentages Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 279*

1. Politician: Those economists who claim that consumer price increases have averaged less than 3 percent over the last year are mistaken. They clearly have not shopped anywhere recently. Gasoline is up 10 percent over the last year; my auto insurance, 12 percent; newspapers, 15 percent; propane, 13 percent; bread, 50 percent.

The reasoning in the politician's argument is most vulnerable to criticism on the grounds that the argument

- (A) impugns the character of the economists rather than addressing their arguments
- (B) fails to show that the economists mentioned are not experts in the area of consumer prices
- (C) mistakenly infers that something is not true from the claim that it has not been shown to be so
- (D) uses evidence drawn from a small sample that may well be unrepresentative
- (E) attempts to persuade by making an emotional appeal

2. Ditrana is a federation made up of three autonomous regions: Korva, Mitro, and Guadar. Under the federal revenue-sharing plan, each region receives a share of federal revenues equal to the share of the total population of Ditrana residing in that region, as shown by a yearly population survey. Last year, the percentage of federal revenues Korva received for its share decreased somewhat even though the population survey on which the revenue-sharing was based showed that Korva's population had increased.

If the statements above are true, which one of the following must also have been shown by the population survey on which last year's revenue-sharing in Ditrana was based?

- (A) Of the three regions, Korva had the smallest number of residents.
- (B) The population of Korva grew by a smaller percentage than it did in previous years.
- (C) The populations of Mitro and Guadar each increased by a percentage that exceeded the percentage by which the population of Korva increased.
- (D) Of the three regions, Korva's numerical increase in population was the smallest.
- (E) Korva's population grew by a smaller percentage than did the population of at least one of the other two autonomous regions.

Numbers and Percentages Problem Set

3. In 1980, Country A had a per capita gross domestic product (GDP) that was \$5,000 higher than that of the European Economic Community. By 1990, the difference, when adjusted for inflation, had increased to \$6,000. Since a rising per capita GDP indicates a rising average standard of living, the average standard of living in Country A must have risen between 1980 and 1990.

Which one of the following is an assumption on which the argument depends?

- (A) Between 1980 and 1990, Country A and the European Economic Community experienced the same percentage increase in population.
- (B) Between 1980 and 1990, the average standard of living in the European Economic Community fell.
- (C) Some member countries of the European Economic Community had, during the 1980s, a higher average standard of living than Country A.
- (D) The per capita GDP of the European Economic Community was not lower by more than \$1,000 in 1990 than it had been in 1980.
- (E) In 1990, no member country of the European Economic Community had a per capita GDP higher than that of Country A.

4. Students from outside the province of Markland, who in any given academic year pay twice as much tuition each as do students from Markland, had traditionally accounted for at least two-thirds of the enrollment at Central Markland College. Over the past 10 years academic standards at the college have risen, and the proportion of students who are not Marklanders has dropped to around 40 percent.

Which one of the following can be properly inferred from the statements above?

- (A) If it had not been for the high tuition paid by students from outside Markland, the college could not have improved its academic standards over the past 10 years.
- (B) If academic standards had not risen over the past 10 years, students who are not Marklanders would still account for at least two-thirds of the college's enrollment.
- (C) Over the past 10 years, the number of students from Markland increased and the number of students from outside Markland decreased.
- (D) Over the past 10 years, academic standards at Central Markland College have risen by more than academic standards at any other college in Markland.
- (E) If the college's per capita revenue from tuition has remained the same, tuition fees have increased over the past 10 years.

Numbers and Percentages Problem Set Answer Key

Question #1. Flaw-#%. The correct answer choice is (D)

The politician's argument is that the claims that price increases have averaged less than 3 percent are wrong, and in support of that position the politician cites several examples of price increases, each of which is greater than 3 percent. As mentioned in one of the chapter sidebars, "an average is a composite number, and within the average there can be a significant degree of variation and no single entity need embody the exact characteristic of the average (for example, the average weight of a 1 pound rock and a 99 pound rock is 50 pounds)." In making the argument, the politician has focused on several individual examples while ignoring the fact that an average is a compilation of many different numbers. Answer choice (D) perfectly captures the essence of this sampling error.

Answer choice (A): The argument does not contain a source or *ad hominem* attack. Simply stating that a position is wrong is different from criticizing the character of that person.

Answer choice (B): To properly claim that the economists are wrong does not require showing that they are not pricing experts, and hence this answer is incorrect.

Answer choice (C): The politician attempts to refute the position by providing evidence about large price increases for certain products. This process, which involves facts, is different from inferring that a claim is false because it has not been shown to be true. This answer choice would better describe an argument such as the following: "you have not proven that God exists, so there must be no God."

Answer choice (D): This is the correct answer. Citing several examples to refute an average is a doomed strategy.

Answer choice (E): There is no appeal to emotion present; percentages are used to make the argument.

Numbers and Percentages Problem Set Answer Key

Question #2. Must-#%. The correct answer choice is (E)

The situation in Ditrama is as follows:

Under the federal revenue-sharing plan, each region receives a share of federal revenues equal to the *share of the total population* of Ditrama residing in that region, as shown by a yearly population survey.

Last year, the *percentage* of federal revenues Korva received for its share *decreased* somewhat even though the population survey on which the revenue-sharing was based showed that Korva's *population had increased*.

If the total population of Korva increased but at the same time they experienced a decrease in revenue allocation, the only possible solution is that the total population of Ditrama increased by more than the Korva increase. Thus, you must seek an answer that indicates that the total population increased more than Korva's population increased. But be careful: this question is one of high difficulty because the test makers do not make it easy to spot the correct answer.

Answer choice (A): Either Mitro or Guadar could have a smaller number of residents than Korva.

Answer choice (B): This answer is impossible to prove because we do not have information about the population growth of Korva in the years prior to the last one.

Answer choice (C): This is the most popular wrong answer choice. The key error is the claim that "Mitro and Guadar *each* increased by a percentage that exceeded" Korva's increase. Although it must be true that at least one exceeded Korva's increase, it does not have to be true that both exceeded Korva, as shown by the following example:

	<u>Before</u>	<u>After (Last Year)</u>
Total Population of Ditrama	30 (100%)	100 (100%)
Population of Korva (people/percent of total)	10 (33%)	15 (15%)
Population of Mitro (people/percent of total)	10 (33%)	10 (10%)
Population of Guadar (people/percent of total)	10 (33%)	75 (75%)

In the example above, only one of the other regions had a population increase that exceeded Korva; the other did not. Hence this answer choice is incorrect. Note also that this example disproves answer choice (A) as well.

Numbers and Percentages Problem Set Answer Key

Answer choice (D): As shown by the previous example, this answer is incorrect.

Answer choice (E): This is the correct answer. From the stimulus we know that Korva had a population increase, but a revenue drop. So, the total population of Ditrana must have increased by more than Korva's increase, and for this to happen, at least one other region must have had an increase in population that exceeded Korva's.

Note that the scenario in answer choice (C) would force answer choice (E) to be correct, and based on the Uniqueness Rule of Answer Choices, answer (C) is incorrect for that reason alone.

Question #3. Assumption-#%. The correct answer choice is (D)

This is a challenging question. The author makes the following argument:

Premise: In 1980, Country A had a per capita gross domestic product (GDP) that was \$5,000 higher than that of the European Economic Community.

Premise: By 1990, the difference, when adjusted for inflation, had increased to \$6,000.

Premise: A rising per capita GDP indicates a rising average standard of living.

Conclusion: The average standard of living in Country A must have risen between 1980 and 1990.

The author has fallen into the trap of believing that an increase in the difference between GDP's means that the *actual* GDP of Country A has increased. Since that is not necessarily the case based on the difference, you should look for the answer that assumes the total GDP of country A has not decreased.

Answer choice (A): The stimulus is clear that the GDP is a "per capita" (per person) figure. Hence, the author does not need to make an assumption regarding actual population increases.

Answer choice (B): The author does need to assume this is true because a bigger GDP gap does not prove that either must have fallen; the actual GDP of both Country A and the European Economic Community (EEC) could rise and the author's argument would still be valid.

Answer choice (C): In the argument the author uses the GDP of the entire EEC. Since the figure for the EEC would necessarily be an average drawn from the numbers of multiple countries, the author does not need to make any assumptions about figures for individual countries within the EEC.

Numbers and Percentages Problem Set Answer Key

Answer choice (D): This is the correct answer. In order to conclude that an increasing difference in GDP translates to an actual increase in GDP, the author must assume that the GDP of the point of comparison, the EEC, did not fall dramatically. Consider the following example, which assigns actual numbers to the GDP of each group in 1980, and then shows a variety of possibilities for the numbers in 1990:

	<u>1980</u>	<u>#1: 1990</u>	<u>#2: 1990</u>	<u>#3: 1990</u>	<u>#4: 1990</u>
GDP of Country A	105	107	156	96	105
GDP of the EEC	100	101	150	90	99
Difference	+5	+6	+6	+6	+6

Each of the four examples for 1990 is consistent with the claim that there is a \$6000 difference between the GDP of Country A and the GDP of the EEC. The first two examples for 1990, #1 and #2, show that the total GDP of Country A, and therefore the standard of living as defined in the stimulus, has risen. Example #3 shows that even though the gap has increased between the two groups, the actual GDP of Country A has *decreased*, and therefore the standard of living in Country A has decreased. This is inconsistent with the author's conclusion, so the author must be assuming that this type of scenario cannot occur. In example #4, we see a second example that is incompatible with the author's conclusion, one where the gap remains at \$6000, but the GDP of Country A remains the same. The author must assume that the fourth scenario also cannot occur, and that the GDP of the EEC cannot drop by the \$1000 that is the amount of the increase in the gap. Hence, the author must assume that if the GDP of the EEC drops, it drops by less than \$1000, and therefore answer choice (D) is correct.

This is clearly a confusing answer, but do not forget that you can always apply the Assumption Negation Technique to any answer choice in an Assumption question. Answer choice (D), when negated, reads: "The per capita GDP of the European Economic Community was lower by more than \$1,000 in 1990 than it had been in 1980." This negation would definitely weaken the argument because it would create a scenario like #3 or one even worse than #4. Because the answer choice weakens the argument when negated, it must be the correct answer.

Answer choice (E): This answer is incorrect for the same reason cited in answer choice (C): since the figure for the EEC would necessarily be an average drawn from the numbers of multiple countries, the author does not need to make any assumptions about the figures for individual countries within the EEC, regardless of year.

Numbers and Percentages Problem Set Answer Key

Question #4. Must-#%. The correct answer choice is (E)

The stimulus does not contain a conclusion, but it does contain an interesting fact set:

“Students from outside the province of Markland, who in any given academic year pay twice as much tuition each as do students from Markland, had traditionally accounted for at least two-thirds of the enrollment at Central Markland College.”

This sentence indicates that the non-Marklanders are paying a greater amount of tuition, and they previously accounted for at least 66% of the enrollment. This statement is followed by:

“Over the past 10 years academic standards at the college have risen, and the proportion of students who are not Marklanders has dropped to around 40 percent.”

This sentence can be deceptive because it contains two ideas that are unrelated and many people assume that the proportion of non-Marklanders has dropped because the academic standards rose. The sentence only states that the non-Marklanders have dropped, not that they dropped *because of* the raised standards.

As you learned from our discussion in this chapter, the fact that the non-Marklanders have dropped in percent does not mean that their actual number has decreased (Misconception #2). The following is an example of how the percent could decrease while numbers could increase:

	<u>10 years ago</u>	<u>Today</u>
Total number of students at Central Markland	100	200
Number of non-Markland students (people/percent of total)	66 (66%)	80 (40%)
Number of Markland students (people/percent of total)	34 (34%)	120 (60%)

Answer choice (A): The stimulus does not cite any reason for why or how the academic standards were increased, so this answer is incorrect.

Answer choice (B): This answer tests your ability to understand the last sentence of the stimulus. As discussed above, the last sentence does *not* provide a reason for the decline in non-Markland students, so removing the stipulation about the rise in academic standards would not tell us whether non-Marklanders would still be enrolled in the college.

Numbers and Percentages Problem Set Answer Key

Answer choice (C): This is a difficult answer. If the size of the college stayed the same, then this answer would be correct. But, as shown by the example above, the statement in this answer does not have to be true when the total size of the college changes. In the example, both Markland and non-Markland student numbers grew.

Answer choice (D): Remember, this is a Must Be True question, so every answer must pass the Fact Test. No information was given about other Markland colleges, so this answer is incorrect.

Answer choice (E): This is the correct answer. If the college's *per capita* revenue from tuition remains constant while at the same time the high-tuition paying non-Marklanders have decreased in percentage, the college must have derived new tuition revenue by raising tuition. In other words, when the percentage of non-Marklanders drops, the average tuition per person must also drop because they pay twice as much as the Markland students. In order to keep the per person revenue the same, fees would have to be raised.

C HAPTER THIRTEEN: EVALUATE THE ARGUMENT QUESTIONS

Evaluate the Argument Questions

Evaluate the Argument questions ask you to consider the question, statistic, or piece of information that would best help determine the logical validity of the argument presented in the stimulus. In other words, you must select the answer choice that decides whether the argument is good or bad.

To better understand this question type, imagine that you are examining an argument and you have to ask one question that—depending on the answer to the question—will reveal whether the argument is strong or weak. By this definition, there must be a flaw in each argument, and your question, if posed correctly, can reveal that flaw or eliminate the flaw. Please note that you are not being asked to prove with finality whether the argument is good or bad—rather, you must simply ask the question that will best help analyze the validity of the argument. For this reason, Evaluate the Argument questions can be seen as a combination of a Strengthen question and a Weaken question: if you ask the best question, depending on the answer to the question the argument could be seen as strong or weak.

As mentioned in Chapter Three, this unusual question type is the only question that does not fall into one of the three question families. Evaluate the Argument questions are actually a combination of the Second and Third Families, and as such you should keep the following considerations in mind:

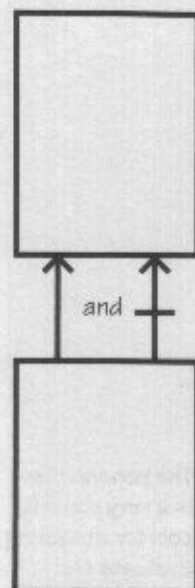
1. In all Second and Third Family questions the information in the stimulus is suspect, so you should search for the reasoning error present.
2. The answer choices are accepted as given, even if they include “new” information. Your task is to determine which answer choice best helps determine the validity of the argument.

Evaluate the Argument question stems almost always use the word “evaluate” or a synonym such as “judge” or “assess,” but the intent is always identical: the question stem asks you to identify the piece of information that would be most helpful in assessing the argument. Question stem examples:

“The answer to which of the following questions would contribute most to an evaluation of the argument?”

“Clarification of which of the following issues would be most important to an evaluation of the skeptics’ position?”

Second and Third Families combined:



"Which of the following would be most important to know in evaluating the hypothesis in the passage?"

"Which of the following would it be most relevant to investigate in evaluating the conclusion of George's argument?"

"Which of the following would it be most helpful to know in order to judge whether what the scientist subsequently learned calls into question the hypothesis?"

Evaluate the Argument questions appear infrequently on the GMAT, but the uniqueness of the question type forces students to take a moment to adjust when they do appear. Some question types, such as Must Be True and Weaken, recur so frequently that students become used to seeing them and are comfortable with the process of selecting the correct answer. When a question type appears rarely, test-takers are often thrown off-balance and lose time and energy reacting to the question. The makers of the GMAT are well aware of this, and this is the reason they intersperse different question types in each section (again, imagine how much easier the GMAT would be if the Verbal section was composed of 25 Must Be True questions). One reason we study each type of question is to help you become as comfortable as possible with the questions you will encounter on the test, making your reaction time as fast as possible.

The Variance Test™

Solving Evaluate questions can be difficult. The nature of the answer choices allow for separate interpretations, and deciding on a single answer can be challenging. In order to determine the correct answer choice on an Evaluate the Argument question, apply the Variance Test™.

The Variance Test consists of supplying two polar opposite responses to the question posed *in the answer choice* and then analyzing how the varying responses affect the conclusion in the stimulus. If different responses produce different effects on the conclusion, then the answer choice is correct. If different responses do not produce different effects, then the answer choice is incorrect. For example, if an Evaluate the Argument answer choice states "What is the percentage of people who live near a nuclear plant?" look to test the two most extreme possibilities: first test the response "0%" for its effect on the conclusion and then test the response "100%" for its effect on the conclusion. If the answer choice is correct, one of the percentages should strengthen the argument and one of the percentages should weaken the argument. If the answer choice is incorrect, neither response will have an effect on the argument.

Of course, the answer choice does not have to be about percentages for the technique to work; the Variance Test will work regardless of the nature of the answer choice. Here are some more example answer choices and Variance Test responses:

The Variance Test is a very powerful tool for attacking Evaluate the Argument questions. Because of the unique structure of Evaluate questions, the Variance Test can only be used with these questions and the test does not apply to any other question type.

If an answer choice asks “Is the pattern permanent?” first test “Yes” as a response and then test “No” as a response (remember, you *must* test opposite answers). If the answer choice is correct, one response should strengthen the argument and one response should weaken the argument. If the answer choice is incorrect, neither response will have an effect on the argument.

If an answer choice asks “Are corporate or environmental interests more important?” first test “Corporate interests are more important” as a response and then test “Environmental interests are more important” as a response. If the answer choice is correct, one response should strengthen the argument and one response should weaken the argument. If the answer choice is incorrect, neither response will have an effect on the argument.

After you have narrowed your answer choices to the Contenders, or to the one answer choice you believe is correct, then apply the Variance Test. Do not apply the Test to all five answers!

Now we will use a question to more fully explore how the question type works and how the correct answer can be determined by the Variance Test. Please take a moment to complete the following question:

1. Advertisement: Most power hedge trimmers on the market do an adequate job of trimming hedges, but many power hedge trimmers are dangerous to operate and can cause serious injury when used by untrained operators. Bolter Industries' hedge trimmer has been tested by National Laboratories, the most trusted name in safety testing. So you know, if you buy a Bolter's, you are buying a power hedge trimmer whose safety is assured.

The answer to which one of the following questions would be most useful in evaluating the truth of the conclusion drawn in the advertisement?

- (A) Has National Laboratories performed safety tests on other machines made by Bolter Industries?
- (B) How important to the average buyer of a power hedge trimmer is safety of operation?
- (C) What were the results of National Laboratories' tests of Bolter Industries' hedge trimmer?
- (D) Are there safer ways of trimming a hedge than using a power hedge trimmer?
- (E) Does any other power hedge trimmer on the market do a better job of trimming hedges than does Bolter Industries' hedge trimmer?

Evaluate the
Argument stimuli
always contain a
conclusion.

As with all questions, you must identify the conclusion of the argument. The conclusion states that if you buy a Bolter's power hedge trimmer, you know the trimmer is safe. In the question stem, we are asked to evaluate the truth of this conclusion. Each answer choice is then posed in the form of a question. The answer choice that is correct will contain the question that, when answered, will reveal whether the conclusion is strong or weak.

In order to understand the application of the Variance Test, we will look at each answer choice in succession and thus we will not perform an initial analysis of the argument (on the GMAT we would analyze the stimulus closely). Also note that on the test we would *not* apply the Variance Test to each answer choice, only to the Contenders. For teaching purposes, we will apply the Variance Test to each answer in an effort to give you the best possible understanding of how the technique works.

Answer choice (A) asks if National Laboratories has performed tests on other machines from Bolter Industries. To apply the Variance Test, we should supply different and opposing answers to the question posed by the answer choice. First, try the answer "No." With this answer, would the fact that National Laboratories did not perform safety tests on other Bolter's machines affect the safety of the Bolter's hedge trimmer? No—this does not help us evaluate the safety of the hedge trimmer. What if the answer was "Yes"? Would the fact that National Laboratories performed safety tests on other Bolters machines affect the safety of the Bolter's hedge trimmer? Not at all. So, regardless of how we respond to the question posed in answer choice (A), our view of the conclusion is the same—we do not know whether the claim that the hedge trimmer is safe is good or bad. According to the Variance Test, if the answer is correct, then supplying opposite answers should yield different views of the conclusion. Since our assessment of the conclusion did not change, the Variance Test tells us that this answer is incorrect.

The question in answer choice (B) is, "How important to the average buyer of a power hedge trimmer is safety of operation?" Again, apply the Variance Test and supply opposite answers to the question in the answer choice. In this case, try "Very Important" and "Not Important." If safety of operation is very important to a buyer of hedge trimmers, would that affect whether the Bolter's hedge trimmer itself is safe? No. Let's look at the opposite side: if safety of operation is not important at all to a buyer of hedge trimmers, would that affect whether the Bolter's hedge trimmer itself is safe? No. Because our view of the validity of the conclusion does not change when we consider different responses to the question posed in answer choice (B), the Variance Test tells us that answer choice (B) is incorrect.

The question in answer choice (C) is, what were the results of the tests of Bolter's hedge trimmer? Using the Variance Test, supply one response that says, "Bolter's hedge trimmer *failed* the safety test." If this is true, then the conclusion is unquestionably weakened. Now supply a response that says, "Bolter's hedge

trimmer *passed* the safety test.” If this is true, then the conclusion is strengthened. So, depending on the answer supplied to the question posed in answer choice (C), our view of the validity of the argument changes: sometimes we view the conclusion as stronger and other times as weaker. Therefore, according to the Variance Test, this is the correct answer. In this instance, the Variance Test reveals the flaw in the argument: the author simply assumed that being tested means safety is assured. Nowhere in the argument did the author mention that the hedge trimmer passed the tests, and the Variance Test reveals this flaw.

In answer choice (D), “Yes” and “No” responses do not change our view of the argument, and answer choice (D) is incorrect.

In answer choice (E), “Yes” and “No” responses do not change our view of the argument, and answer choice (E) is incorrect.

The key thing to note is that the Variance Test is applied according to the nature of each answer choice. Thus, with some answer choices we might supply responses of “Yes” and “No,” and other answer choices might require responses of “0%” and “100%,” or “Very Important” and “Not Important.” But, in each case, the answers we supply are opposites, and the correct answer is always the one that changes your view of the validity of the conclusion when those different responses are supplied. If your view of the argument does not change, then the answer choice is incorrect.

Keep in mind that the Variance Test should only be applied to the contending answer choices. In the discussion above we applied it to every answer choice, but we did this simply to show how to effectively apply the Variance Test. During the actual test you would only want to apply the Variance Test to two or three answer choices at most.

All flawed arguments contain an error of assumption. The correct answer in an Evaluate the Argument question reveals that error.

Evaluate the Argument Question Type Review

Evaluate the Argument questions ask you to consider the question, statistic, or piece of information that would best help determine the logical validity of the argument presented in the stimulus.

Evaluate the Argument questions are a combination of the Second and Third Families, and as such you should keep the following considerations in mind:

1. In all Second and Third Family questions the information in the stimulus is suspect, so you should search for the reasoning error present.
2. The answer choices are accepted as given, even if they include “new” information.

Evaluate the Argument question stems almost always use the word “evaluate” or a synonym such as “judge” or “assess.”

To determine the correct answer choice on an Evaluate the Argument question, apply the Variance Test™ by supplying two opposite responses to the question posed *in the answer choice* and then analyze how the varying responses affect the conclusion in the stimulus. If different responses produce different effects on the conclusion, the answer choice is correct. If different responses do not produce different effects, the answer choice is incorrect.

The Variance Test should only be applied to Contenders (to determine which one is correct) or to the answer choice you believe is correct (to confirm your selection).

Evaluate the Argument Question Problem Set

Please complete the problem set and review the answer key and explanations. *Answers on Page 292*

1. Columnist: George Orwell's book *1984* has exercised much influence on a great number of this newspaper's readers. One thousand readers were surveyed and asked to name the one book that had the most influence on their lives. The book chosen most often was the Bible; *1984* was second.

The answer to which one of the following questions would most help in evaluating the columnist's argument?

- (A) How many books had each person surveyed read?
- (B) How many people chose books other than *1984*?
- (C) How many people read the columnist's newspaper?
- (D) How many books by George Orwell other than *1984* were chosen?
- (E) How many of those surveyed had actually read the books they chose?

2. Anders: The physical structure of the brain plays an important role in thinking. So researchers developing "thinking machines"—computers that can make decisions based on both common sense and factual knowledge—should closely model those machines on the structure of the brain.

Yang: Important does not mean essential. After all, no flying machine closely modeled on birds has worked; workable aircraft are structurally very different from birds. So thinking machines closely modeled on the brain are also likely to fail. In developing a workable thinking machine, researchers would therefore increase their chances of success if they focus on the brain's function and simply ignore its physical structure.

In evaluating Yang's argument it would be most helpful to know whether

- (A) studies of the physical structure of birds provided information crucial to the development of workable aircraft
- (B) researchers currently working on thinking machines take all thinking to involve both common sense and factual knowledge
- (C) as much time has been spent trying to develop a workable thinking machine as had been spent in developing the first workable aircraft
- (D) researchers who specialize in the structure of the brain are among those who are trying to develop thinking machines
- (E) some flying machines that were not closely modeled on birds failed to work

Evaluate the Argument Question Problem Set Answer Key

Question #1. Evaluate. The correct answer choice is (B)

The conclusion of the argument is the first sentence: "George Orwell's book *1984* has exercised much influence on a great number of this newspaper's readers." The basis for this conclusion is that *1984* was the second most named book in a survey about influential books. The argument contains a serious error: just because *1984* came in second in the survey does not mean that "a great number" of readers selected it as influential. To illustrate this proposition, consider the following example:

Number of people surveyed = 1000

Number of people naming the Bible as the most influential book = 999

Number of people naming *1984* as the most influential book = 1

In this example, *1984* has come in second, but no one would say this second place finish supports a conclusion that "*1984* has exercised much influence on a great number of this newspaper's readers." You can expect the correct answer to address this issue.

Answer choice (A): The survey in the argument asks readers to name the one book with the most influence in their lives; the number of books read does not affect this answer. To apply the Variance Test, try opposite answers of "1" and a large number, say "10,000." These numbers will not alter the evaluation of the argument, and thus this answer is incorrect.

Answer choice (B): This is the correct answer, but it can be difficult since the wording is a bit unusual. The question is intended to reveal how many people selected *1984* relative to the other choices, and this addresses the issue raised in the analysis of the stimulus. Consider how the variance test works for this answer choice:

First try the response, "999." In this case, only one person selected *1984* as the most influential book, and the argument is greatly weakened.

Next try the response, "501." In this instance, 499 people selected *1984* as the most influential book and the conclusion is strengthened (the other 501 people would have selected the Bible). Note that you cannot try a number larger than 501 because that would mean that the Bible was not named most often.

Because the varied responses produce different evaluations of the argument, this answer is correct.

Answer choice (C): This answer is not relevant to the columnist's argument. Apply the Variance Test to disprove this answer by using opposite answers of "0" and a very large number, such as "1 million."

Evaluate the Argument Question Problem Set Answer Key

Answer choice (D): Because the argument is about Orwell's *1984*, other Orwell books chosen by the readers have no impact on the argument. Apply the Variance Test, using opposite answers of "0" and a small number such as "10" (Orwell wrote dozens of essays, but not dozens of books).

Answer choice (E): The survey in the argument addresses influence, not the actual reading of the book. A person might be influenced by a book like the Bible through church teachings, etc. without actually having read the book. To apply the Variance Test, try opposite answers of "0" and "1000."

Question #2. Evaluate. The correct answer choice is (A)

Yang's argument is as follows:

Premise: Important does not mean essential.

Premise: No flying machine closely modeled on birds has worked; workable aircraft are structurally very different from birds.

Premise/
Subconclusion: So thinking machines closely modeled on the brain are also likely to fail.

Conclusion: In developing a workable thinking machine, researchers would therefore increase their chances of success if they focus on the brain's function and simply ignore its physical structure.

Yang's conclusion is very strong: "simply ignore the physical structure of the brain" when developing a thinking machine. As you might expect, this extreme conclusion and the relatively weak supporting evidence plays a role in the correct answer. Also note that the question stem uses the word "whether" to turn each answer choice into a question.

Answer choice (A): This is the correct answer. The Variance Test proves the answer:

If the answer is "Yes, they did provide crucial information" then developers should not ignore the physical structure of the brain because the reasoning used to make that judgment (via the flying machine analogy) is faulty.

If the answer is "No, they did not provide crucial information" then the argument is strengthened because the analogy suggests it would be acceptable to ignore the physical structure of the brain.

Because the varied responses produce different evaluations of the argument, this answer is correct.

Answer choice (B): The conclusion is about ignoring the physical structure of the brain, and information about what constitutes thinking will not help evaluate the argument. Apply the Variance Test to disprove this answer by using opposite answers of "Yes" and "No."

Evaluate the Argument Question Problem Set Answer Key

Answer choice (C): The relative amount of time spent on each project is not an issue in the stimulus. Apply the Variance Test to disprove this answer, using opposite answers of "Yes, as much time was spent" and "No, not as much time was spent."

Answer choice (D): The argument does not involve the background of the researchers and the projects they work on, only what they should focus on when trying to succeed. Hence, this answer is incorrect. Apply the Variance Test, using opposite answers of "Yes, they are among those trying to develop thinking machines" and "No, they are not among those trying to develop thinking machines."

Answer choice (E): The analogy in the argument is about flying machines that were modeled on birds. The possibility that some flying machines that were not modeled on birds failed has no place in the argument. Apply the Variance Test, using opposite answers of "Yes, some failed" and "No, none failed."

C HAPTER FOURTEEN: TEST READINESS

The day before the test

On the day before your GMAT appointment, we recommend that you study very little, if at all. The best approach for most students is to simply relax as much as possible. Read a book, go see a movie, or play a round of golf. If you feel you must study, we recommend that you only briefly review each of the concepts covered in the course.

If you are not familiar with the location of your test center, drive by the test center and survey the parking situation. This will alleviate anxiety or confusion on the day of the test.

Eat only bland or neutral foods the night before the test and try to get the best sleep possible.

The morning of the test

Attempt to follow your normal routine on the morning of the test. For example, if you read the paper every morning, do so on the day of the test. If you do not regularly drink coffee, do not start on test day. Constancy in your routine will allow you to focus on your primary objective: performing well on the test.

Dress in layers, so you will be warm if the test center is cold, but also able to shed clothes if the test center is hot.

You must arrive at the test center approximately 30 minutes before your scheduled appointment time.

We strongly believe that performing well requires confidence and a belief that you can perform well. As you prepare to leave for the test, run through the test in your head, visualizing an exceptional performance. Imagine how you'll react to each math problem, essay question, and verbal problem. Many athletes use this same visualization technique to achieve optimal performance.

The following pages contain general notes on preparing for the day of the GMAT.

Do not study hard the day before the test. If you haven't learned it by then, that final day won't make much difference.

Yes, you read that correctly. You may be thumbprinted or photographed at the test center. This is done for test security purposes.

At the test center

Upon check-in, test supervisors will ask you to acceptable personal identification (typically a driver's license or passport). Supervisors are instructed to deny admission to anyone who does not present a photo ID with signature. They may also take a thumbprint, photograph you, or videotape you.

The test supervisors will assign each examinee a work station. You are not permitted to choose your own station.

Once you are seated, testing will begin promptly.

Food and drink are not allowed in the testing room.

You may not leave your work station during the timed portions of the test.

If you engage in any misconduct or irregularity during the test, you may be dismissed from the test center and may be subject to other penalties for misconduct or irregularity. Actions that could warrant such consequences are creating a disturbance; giving or receiving help; removing scratch paper or notes from the testing room; eating or drinking during the test; taking part in an act of impersonation or other forms of cheating; or using books, calculators, ear plugs, headsets, rulers, or other aids. The penalties for misconduct are high: you may be precluded from attending business school.

If you encounter a problem with the test or test center itself, report it to a test administrator. Reportable problems include: power outages, computer malfunctions, and any unusual disturbances caused by an individual.

If you feel anxious or panicked for any reason before or during the test, close your eyes for a few seconds and relax. Think of other situations where you performed with confidence and skill.

After the test

At the end of the test you will be presented with the option of cancelling your score. This is the only opportunity you have to cancel your score, and you must make the decision without the benefit of knowing how you scored. Once a score is cancelled, it cannot be reinstated and you do not receive a refund of your test fee.

If you choose to accept your score, you will see your unofficial scores from the multiple choice sections immediately, and you can print out a copy of your results. Official test results will be mailed to you approximately two weeks after the test.

Afterword

Thank you for choosing to purchase the *PowerScore GMAT Critical Reasoning Bible*. We hope you have found this book useful and enjoyable, but most importantly we hope this book helps raise your GMAT score.

In all of our publications we strive to present the material in the clearest and most informative manner. If you have any questions, comments, or suggestions, please do not hesitate to email us at crbible@powerscore.com. We love to receive feedback and we do read every email that comes in!

Also, if you haven't done so already, we strongly suggest you visit the website for this book at:

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This free online resource area contains supplements to the book material, provides updates as needed, and answers questions posed by students. There is also an official evaluation form that we encourage you to use.

If we can assist you in any way in your GMAT preparation or in the business school admissions process, please do not hesitate to contact us. We would be happy to help.

Thank you and best of luck on the GMAT!

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C COMPLETE CHAPTER ANSWER KEY

Notes

Answers to every question used in this book are found in the text of the chapter or in the chapter explanations. The consolidated answer key in this section contains three parts: the first part provides a question description legend, the second part provides an identification of the Three Question Families, and the third part provides a quick chapter-by-chapter answer key for students who need to find the answers quickly.

Question Description Legend

Question Type Designations

Must = Must Be True

MP = Main Point

Assumption = Assumption

Strengthen = Strengthen/Support

Resolve = Resolve the Paradox

Weaken = Weaken

Method = Method of Reasoning

Flaw = Flaw in the Reasoning

Parallel = Parallel Reasoning

Evaluate = Evaluate the Argument

FITB = Fill in the blank

AP = Argument Part

X = Except question

Problem Type Designations

CE = Cause and Effect

#% = Numbers and Percentages

Question Family Categorization

Family #1, also known as the Must Be or Prove Family, consists of the following question types:

- (1) Must Be True
- (2) Main Point
- (7) Method of Reasoning
- (8) Flaw in the Reasoning
- (9) Parallel Reasoning

Family #2, also known as the Help Family, consists of the following question types:

- (3) Assumption
- (4) Strengthen/Support
- (5) Resolve the Paradox

Family #3, also known as the Hurt Family, consists of the following question type:

- (6) Weaken

Evaluate the Argument questions are a combination of the Second and Third Families.

C **OMplete Chapter Answer Keys**

Notes

The chapter-by-chapter answer key lists every problem in this book in chronological order and identifies the classification of the question. You can use this answer key as a quick reference when you are solving problems. Each problem is explained in more detail in the text of the chapter.

Chapter-by-Chapter Answer Key

Chapter 2: Logical Reasoning Basics Chapter Text

1. Must (B)

Chapter 4: Must Be True Chapter Text

1. Must (D)
2. Must (E)
3. Must (B)
4. Must (B)
5. Must (B)

Chapter 4: Must Be True Problem Set

1. Must (A)
2. Must (B)
3. Must (E)
4. Must (C)
5. Must (C)
6. Must (C)
7. Must (B)
8. Must (B)

Chapter-by-Chapter Answer Key

Chapter 5: Main Point Chapter Text

1. MP (C)
2. MP (C)

Chapter 5: Main Point Problem Set

1. MP (C)
2. MP (D)

Chapter 6: Weaken Chapter Text

1. Weaken (A)
2. Weaken (B)

Chapter 6: Weaken Problem Set

1. Weaken (B)
2. Weaken (D)
3. Weaken (B)
4. Weaken (A)
5. Weaken (A)
6. Weaken (E)

Chapter 7: Cause and Effect Chapter Text

1. Flaw-CE (D)
2. Weaken-CE (A)

Chapter 7: Cause and Effect Problem Set

1. Weaken-CE (D)
2. Must-CE (C)
3. Weaken-CE (C)
4. Weaken-CE (B)
5. Flaw-CE (C)
6. Weaken-CE (A)

Chapter-by-Chapter Answer Key

Chapter 8: Strengthen and Assumption Chapter—Strengthen Text

1. Strengthen (E)
2. StrengthenX (E)
3. StrengthenX-CE (E)
4. StrengthenX-CE (A)

Chapter 8: Strengthen and Assumption Chapter—Strengthen Problem Set

1. Strengthen (A)
2. Strengthen (B)
3. StrengthenX-CE (B)
4. Strengthen-CE (D)

Chapter 8: Strengthen and Assumption Chapter—Assumption Text

1. Assumption (D)
2. Assumption (A)
3. Assumption-CE (E)

Chapter 8: Strengthen and Assumption Chapter—Assumption Problem Set

1. Assumption (C)
2. Assumption (B)
3. Assumption (D)
4. Assumption (A)
5. Assumption (E)

Chapter 9: Resolve Chapter Text

1. Resolve (C)
2. Resolve (B)

Chapter 9: Resolve Problem Set

1. Resolve (B)
2. Resolve (A)
3. Resolve (B)
4. Resolve (D)

Chapter-by-Chapter Answer Key

Chapter 10: Method of Reasoning and Flaw in the Reasoning Chapter Text

- 1. Method (C)
- 2. Method (E)
- 3. Method-AP (C)

Chapter 10: Method of Reasoning and Flaw in the Reasoning Problem Set

- 1. Method (D)
- 2. Method-CE (D)
- 3. Method-AP, CE (C)
- 4. Flaw (C)
- 5. Flaw (A)

Chapter 11: Parallel Reasoning Chapter Text

- 1. Parallel Flaw (D)
- 2. Parallel Flaw (E)

Chapter 11: Parallel Reasoning Problem Set

- 1. Parallel Flaw (B)
- 2. Parallel Flaw-CE (D)
- 3. Parallel Flaw (D)

Chapter 12: Numbers and Percentages Chapter Text

- 1. Must-#% (C)
- 2. Must-#% (C)
- 3. Weaken-#% (D)
- 4. Strengthen-#% (C)
- 5. Flaw-#% (B)

Chapter 12: Numbers and Percentages Problem Set

- 1. Flaw-#% (D)
- 2. Must-#% (E)
- 3. Assumption-#% (D)
- 4. Must-#% (E)

Chapter-by-Chapter Answer Key

Chapter 13: Evaluate the Argument Chapter Text

1. Evaluate (C)

Chapter 13: Evaluate the Argument Problem Set

1. Evaluate-#% (B)
2. Evaluate (A)

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