CAT 2003 Answer Key

1.	1	**41.**	1	**81.**	3	**121.**	3
2.	4	**42.**	3	**82.**	4	**122.**	1
3.	2	**43.**	1	**83.**	3	**123.**	4
4.	3	**44.**	1	**84.**	2	**124.**	2
5.	2	**45.**	3	**85.**	4	**125.**	4
6.	4	**46.**	3	**86.**	1	**126.**	3
7.	4	**47.**	1	**87.**	1	**127.**	4
8.	1	**48.**	2	**88.**	1	**128.**	4
9.	3	**49.**	3	**89.**	2	**129.**	3
10.	1	**50.**	3	**90.**	3	**130.**	2
11.	3	**51.**	4	**91.**	3	**131.**	1
12.	2	**52.**	2	**92.**	4	**132.**	3
13.	1	**53.**	4	**93.**	1	**133.**	2
14.	3	**54.**	2	**94.**	4	**134.**	3
15.	2	**55.**	1	**95.**	3	**135.**	4
16.	3	**56.**	3	**96.**	1	**136.**	3
17.	2	**57.**	4	**97.**	3	**137.**	2
18.	4	**58.**	4	**98.**	3	**138.**	3
19.	1	**59.**	1	**99.**	2	**139.**	1
20.	4	**60.**	2	**100.**	1	**140.**	4
21.	2	**61.**	3	**101.**	4	**141.**	4
22.	1	**62.**	2	**102.**	3	**142.**	1
23.	3	**63.**	4	**103.**	3	**143.**	2
24.	3	**64.**	1	**104.**	2	**144.**	3
25.	2	**65.**	2	**105.**	3	**145.**	4
26.	3	**66.**	3	**106.**	1	**146.**	1
27.	3	**67.**	4	**107.**	2	**147.**	2
28.	2	**68.**	3	**108.**	3	**148.**	1
29.	1	**69.**	1	**109.**	4	**149.**	1
30.	4	**70.**	4	**110.**	1	**150.**	2
31.	1	**71.**	2	**111.**	3		
32.	2	**72.**	1	**112.**	2		
33.	3	**73.**	1	**113.**	4		
34.	1	**74.**	4	**114.**	2		
35.	2	**75.**	4	**115.**	4		
36.	2	**76.**	3	**116.**	2		
37.	2	**77.**	3	**117.**	3		
38.	1	**78.**	2	**118.**	3		
39.	4	**79.**	4	**119.**	3		
40.	2	**80.**	2	**120.**	2		

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CAT 2003 Solutions

1.	The correct idiomatic expression is "…fall back on …..". "….on the fatalism" is wrong in that fatalism has been used in a very general way and not in any special sense. Please remember that fatalism is only one explanation, so the expression *explanations* in line C is *wrong*.
2.	*Not only* has to be coupled with *but also* to make it correct. Line C makes unnecessary use of two commas apart from having a wrong placement for *not only*. Line B changes the intended meaning by using *not regarded,* while line A uses the idiomatically wrong *valuable for itself.*
3.	Line D uses *consist*, which doe not gel with *running*, the subject in this case. A similar problem ails line A which uses the same combination. C, apart from being awkward, conveys a wrong meaning. Thus the only option which seems to convey the right idea is 2.
4.	Line B places *sixteenth century* at the wrong position, thereby rendering it awkward. Line D tends top convey a wrong idea.
5.	Line C makes an unnecessarily long sentence, while D changes the idea. Between A and B, the latter is better because if its being clear, unambiguous and crisp.
6.	It could have been a *group of boy-scouts, a gang of boy scouts* etc. *A bundle of boy-scouts* is certainly an unidiomatic expression.
8.	*He is clear about* .... would have been a much better and accepted expression.
9.	It should be *tea of sorts*…..
10.	The intended idea is that of effort, while *implication* means involvement in some wrong-doing, because of which it is a misfit.
11.	E is a brilliant general, introductory comment, being further elaborated by B. Besides, line A is continued beautifully by D.
12.	A makes for a good general, opening line. B-D make an excellent pair for D tends to support B. Again C-E seem to be in good company with each other.
13.	A-B form a good pair as B is a consequence of A, but it does no make any sense after D. So option 3 is ruled out. .
15.	C talks of a problem, E describes it while A offers a solution to it – CEA. Besides, BD form a logically connected pair.
16.	Option 1 is ruled out as the treatment of a problem cannot compound it. Friendship outside college does not facilitate the detection of maladjustment. Between the rest two, option 3 makes much more sense than the other one.
17.	One does not ratify defeat, thus option 4 is ruled out. The second word in the first option does not make sense as to acquire something, one needs cash. The third option could have correct but for the absence of *of* after the word *dispose*.
18.	Rewards are not conferred, ruling out option 3. The second word in option 2 does not fit in the context. Only option 4 makes logical sense.

20.	Between options 1 and 4, the latter is more sensible, as *discrete,* despite meaning *separate*, does not imply *different*.
21.	……But do not hurry the journey at all. Better if it lasts for years, so you are old by the time you reach the island, ……
22.	The last lines of the second and the fourth stanzas hold the key to this question.
23.	……Wise as you will have become, so full of experience, you will have understood by then what these Ithakas mean….
25.	It is quite an encouraging poem. Thus the answer is justified.
26.	Please refer back to the 4th line of the 6th paragraph.
27.	…..The anti-GM campaign has been quite effective in Europe, with several European Union member countries imposing a virtual ban ……
28.	You just need to go back to the very last paragraph.
29.	…It is quite likely that the GM controversy will soon hit the headlines in India since a spokesperson of the Indian Central government has recently announced that the government may use the protato in its midday meal …..
31.	Please red the first few lines of the second paragraph.
32.	Interest, wonder, sympathy, and love, the first two leading to the last two, are the psychological prerequisites for social life; and the need for the first two must not be underrated.
33.	Please refer back to the first few lines of the 5th paragraph.
35.	The penultimate paragraph contains the answer to this question.
36.	Please refer to the 4th paragraph.
39.	The doctor's research sets up a link between the consumption of red wine and low incidence of heart disease. Obviously, only option 4 tends to support the doctor's conclusion.
40.	Please go back to the first few lines from the fifth paragraph.
41.	The last few lines of the 3rd paragraph hold the answer to this one.
43.	After 1857, the British stopped annexing one princely state after another, and instead treated the princes as allies. 44. The white man's burden came up as a new moral rationale for conquest. It was supposedly for the good of the conquered. ……..
45.	Please go back to the concluding paragraph, last few lines to get the answer.
46.	……..it appeared unlikely that this mathematical law and order should turn out to be restricted to certain special phenomena…… all the physical processes of nature would prove to be unfolding themselves according to rigorous mathematical laws.
47.	Please refer to lines 4-5 of the first paragraph.

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48.	The first few lines of the second paragraph hold the key.
50.	Read the middle of the concluding paragraph to locate the answer.
51.	Here it would be futile for the students to compare all the universities stated above and hence they must keep in mind that they should look through the options and try to locate the answer! The best thing to be done would be to mark these universities in pencil and find the answer! Another thing to be noted is that the answer is choice four, and hence, if the students have checked the first three choices they need not look at the fourth choice (which must be the answer!). Hence 4th option.
52.	2 (Stanford and New York). Northwestern has a tie at median salary and hence won't be considered.
53.	Reading all the rankings from the table, it is easy to see that 8 universities have single digit rankings on 3 of the 4 parameters.
54.	The most critical part is that an older child is always taller and weighs more than a younger child. Here, the number of children with Age 9 years or less is 48 (Not exceeding that age) and the height of upto 135 cm. would mean a number of 45 students. Now since the limiting factor is 135 cm. as height, the number of students would be 45!
55.	The most confusing part here could be what values to consider and which ones to leave out. Here the critical data: an older child is always taller and weighs more than a younger child, would help in solving! 40 students are above 10 years, 25 exceed 150 cms in height, and 9 students weigh more than 48 Kg. Out of 40 students above 10 years of age, only 25 exceed 150 cm. in height and since the oldest students are the heaviest, 9 students out of this should be excluded! Hence, the answer would be (25-9) i.e 16! Choice 1 is the answer!
56.	The number of children between 6 years and 12 years is 77 – 22 = 55. The number of children greater than 38 kg is 100 – 33 = 67. So it seems that the answer should be 55. However, there are 33 children who are less than 38 kg. Therefore the required answer is 77 – 33 = 44.
57.	A. Success rate for males in 2003 = 637 / 60133 Success rate for female 2003 = 399 / 40763 so male success rate is higher & stmt is false. B. S. R – female – 2002 = 138 / 15389 S. R female – 2003 = 399 / 40763 1st much less than 10% 2nd is almost 10 %, but slightly lesser So stmt B is also false.
58.	2002 – *f* - 48 / 19236 (2.5%) 2002 – *m* - 171 / 61205 (2.8%) so stmt A is false. S.R. 2002 – males – 171/684 S.R. 2002 – females – 48/138 so stmt. B is false.
59.	A. *F* – absentees in 2002 = (19236 – 15389) / 19236 = 20% *F* – Absentees in 2003 = (45292 – 40763) / 45292 = 10%. So A is a true. B. M – Absentees in 2003 = (61205 – 5998) / 61205 = 20% This is higher than 10% So B is false.
60.	For this draw a diagonal of the square of graph. All cos above diagonal have profit margin > 10% No=7
61.	Steel cos. With turnover > 2000 = 3. Profits for each of them are 120, 280, & 330 So 2 cos with profit less than 300.
62.	Profit exceeding 10% turnover is cos above the diagonal. Six cos have turnover > 1000. Of the 6 companies, 1 is textile so answer is 5.
63.	A 4914 / 24568 = 20% B 4075 / 25468 = 16% C 4750 / 23752 = 20% D 3946 / 15782 = 25%
64.	(2458 + 25468) / 89570 = 50036 / 89570 = 56%
65.	Amt. was under subscribed on foll date: 17–Jul – 02, maturity - 15 yrs -- once
66.	1. Not true for 17- Jul, 9-Apr, 4 – Jun 2. does not exceed on 4 – Jun 3. True for 4- Jun
67.	1. True 2. True on 3rd – Apr 2nd round 3. Low maturity → higher demand true. 4. Not true for 07- Nov, 5- May, 2- July
68.	It is important to understand the meaning of the question. The question asks you to identify the increasing category, keeping into the mind the increase as compared to previous increase. We find that financial & products are increasing but the products category although it is increasing but at a reduced rate every term. Hence 3rd option.
69.	Health spam in Dec 02 = 19% of *x* . Jun 03 = 18% of *y*. Now *x* > *y*. So health spam of Dec 02 was > health spam of Jun 03.
70.	Sep 02 is 25% of x. Mar 03 is 37% of y. If x<y then first one is smaller. But if x is much larger than y then first one can be bigger. So cannot be determined.
71.	Seeta's rate of growth started to decline after the 3rd month – the slope decreased even though it continued to increase.
72.	Has to be Geeta. Her line for the 1st 2 months has the highest average slope.
73.	Third month Seeta has very high slope. The others all start from the same point but geeta reaches the lowest. Option 1.
74.	Shyam grew the least. He grew from 53cm to 62. In contrast Seeta grew from 50 to 60. The percentage and absolute amount both are less for shyam.
75.	Now at the least one of the min. age person is always < 40.. to 8 respondents are < 40. Now add the second male from cell 2(32, 33) So ans. is 9/30 = 30%
76. – 77.	Consider this cell by cell Cell age — At most > 35. — At least 35 – 40 1(38, 38) — 1 — 1 5(34, 49) — 4 — 0 1(32, 32) — 0 — 0 8(35, 57) — 7 — 1 8(21, 65) — 7 — 0 3(37, 63) — 3 — 1 2(31, 33) — 0 — 0 2(27, 40) — 1 — 1 **Total** — **23** — **4**
76.	So ans is. 23/30 = 76.77.
77.	So ans is 4/30 = 13.33 %
78.	50 + 50 — Direct — Indirect OR = Red + yell — 22 — 22.5

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	PI =	50 R + 50 W	18	17.5
	CR =	70W + 30 Y		22
	AV =	50 OR + 50 PI		19.75
	WO =	50 OR + 50 W		18.5

For AV = 22 + 17.5 /2 = 39.5 /2 = 19.75

79. WO = 25 R + 25 Y + 50 W. Ratio of 1: 1: 2

80. Price of AV = 19.75
CR = 15 * 0.7 + 25 * 0.3 = 18.00. WO = 0.5 * 22 + 0.5 * 15 = 18.50 most profitable to sell CR

81. C/D/1 E/F/2 E/F/3 B/4 C/D/5 A/G/6 A/G/7
The above gives the persons possible at each place.
F cannot be at either end, so answer is option 3.

82. A will either have D, C or G as neighbour. Opt 4.

83. Since G is to extreme right, he can't sit next to B , So option 3.

84. Following are the rules
1. D→ ~ F.
2. C → Home / Fin / None
3. B → Pav, D → Tele / B – Tele, D → Pav
4. E → A Check each point for each rule

1. Rule 2 isolated
2. Ok.
3. Ok Rule 1 isolated.
4. Rule 2 isolated.

85. Following assignments are possible

A → Home	A → Home
C → Fin	C → Fin
B → Pao / tele	B → Power / tele
D → Pao/ tel	D → Def.
E → Def. 1	E → Power/ tel
1. Ok	A → Home
2. Ok	C → Fin
3. Not Ok	B → tele
4. Ok	E → Power/ tel

86.

G = A – 8	A + G = 40
D + R = 37	A – G = 8
J = D + 8	So A = 24 G = 16
A = D+ 5	So D = 19
A + G = 40	So J = 27
	So R = 18. Opt. 1 is right

87. D = 19, J = 27. So D+J = 46.

88. FS1 FS2 F M MS1 MS2 MS3 MS4 MS5

\ /

S

FS – Father sibling, MS – Mother sibling
A. tells us that FS1 & FS2 are uncles of S. So mother has to have 2 brothers and 3 sisters.
B does not tell us about the gender of the siblings of M. So option 1

89. If game ended normally then he won Rs 100. But he incurred a loss of Rs 50. So he must have spent RS 150. Rs 10 is entry fee so no of throws is 140.
B tells us that he has lost Rs. 138 + Rs. 10 for sure, now if he gets 2 heads he will get Rs. 100 and again he would have spent Rs. 150. Either statement can provide a solution. Hence 2.

90. A. She bought 21 products of soap. And the first 20 did not contain any S. So we cannot be sure of how many of them are vowels.
B. No. of O and A was 18. We don't know about P and S.
So using both, no of P = 20 – 18 = 2 So ans. is 3

91. If A takes X seconds then B takes (x + 60) seconds to run 1000 m.
Ratio of speeds of A and C = 1000 : 625 = 8 : 5
Ratio of times taken by A and C = 5 : 8
If B takes y second then C takes y + 30 seconds to run 1000 m.
Hence 5 (y + 30) = 8x …(i)
and $\frac{1000}{x+60} = \frac{1000}{y}$ . . .(ii)
Solving we get the values of x and y.
Hence both statements are required.

92. Now given that C, the accountant is married to F the professor. It is also given that the lawyer is married to housewife, D. Also A has married a housewife. Since there are only two married couples, A has to be the lawyer.

		(F)	(M)	(F)		(F)
	A	B	C	D	E	F
(F) HW 1	×	×	×	√	×	×
(F) HW 2	×	√	×	×	×	×
(F) Prof	×	×	×	×	×	√
(M) Eng	×	×	×	×	√	×
(M) Acct	×	×	√	×	×	×
(M) Law	√	×	×	×	×	×

93.

		(F)	(M)	(F)		(F)
	A	B	C	D	E	F
(F) HW 1	×	×	×	√	×	×
(F) HW 2	×	√	×	×	×	×
(F) Prof	×	×	×	×	×	√
(M) Eng	×	×	×	×	√	×
(M) Acct	×	×	√	×	×	×
(M) Law	√	×	×	×	×	×

E is an Engineer.

94.

		(F)	(M)	(F)		(F)
	A	B	C	D	E	F
(F) HW 1	×	×	×	√	×	×
(F) HW 2	×	√	×	×	×	×
(F) Prof	×	×	×	×	×	√
(M) Eng	×	×	×	×	√	×
(M) Acct	×	×	√	×	×	×
(M) Law	√	×	×	×	×	×

We cannot say for sure about A & E so cannot be determined.

95. Each friend eats both idli + vada except one

	Idlis				
	1	4	5	6	8
I	×	×	×	√	×
S	√	×	×	×	×
M	×	√	×	×	×
D	×	×	√	×	×
B	×	×	×	×	√
	Wadas				
	0	1	2	4	6
I	×	×	×	×	√
S	√	×	×	×	×
M	×	×	√	×	×

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D	×	√	×	×	×
B	×	×	×	√	×

Chutney		
	Y	N
I	√	×
S	×	√
M	×	√
D	√	×
B	×	√

3rd option

96. Each friend eats both idli + vada except one

	Idlis				
	1	4	5	6	8
I	×	×	×	√	×
S	√	×	×	×	×
M	×	√	×	×	×
D	×	×	√	×	×
B	×	×	×	×	√
	Wadas				
	0	1	2	4	6
I	×	×	×	×	√
S	√	×	×	×	×
M	×	×	√	×	×
D	×	√	×	×	×
B	×	×	×	√	×

Chutney		
	Y	N
I	√	×
S	×	√
M	×	√
D	√	×
B	×	√

1st option

97. Each friend eats both idli + vada except one

	Idlis				
	1	4	5	6	8
I	×	×	×	√	×
S	√	×	×	×	×
M	×	√	×	×	×
D	×	×	√	×	×
B	×	×	×	×	√
	Wadas				
	0	1	2	4	6
I	×	×	×	×	√
S	√	×	×	×	×
M	×	×	√	×	×
D	×	√	×	×	×
B	×	×	×	√	×

Chutney		
	Y	N
I	√	×
S	×	√
M	×	√
D	√	×
B	×	√

3rd option

98. Since four figures are known to us the fifth figure is generated by either treating 2517 as the maximum or 1193 as minimum with difference of 1378 and prepare two charts. Treating 1193 as minimum will have a contrasting situation while comparing the information of Helen and Dhenuka. Keeping 2517 as max will generate 2517 – 1378 = 1139 as the min amount spent which will belong to Chellama. After satisfying all the conditions we get the following information about the amounts spent:
Shehnaz – 2517
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101. Let the radius of the sphere *A* be *a* and that of *B* be *b*. Since area is proportional to the square of the radius we can say that $(b/a)^2 = 4/1$
So $b/a = 2/1$. The volume has a cubic relationship, So $Vb / Va = (2/1)^3 = 8/1$. So $Vb - Va / Va = 7/8 = 87.5\ \%$

102. For a score of 32, the net rights has to be > 32
Let the no. of rights be *R*
Let the no. of wrongs be *W*
So no. of non-attempts would be $50 - R - W$
$32 = R - W/3 - (50 - R - W)/6$
Simplifying this we get,
$7R - W = 242$. But R and W can only have integral values. If we take W as 3, then $7R$ is 245, in which case R is 35.

103. $a + 2d + a + 14d = a + 5d + a + 10d + a + 12d.$
$0 = a + 11d$; => 12^{th} term = 0

104. $\log_{10}x = X$ => $\log_{10}X = 1/x$ => $10^{1/x} = X$,
⇨ $X^{1/x} = 10$.
which will be possible for only one value of *x* between 2 and 3. So answer is option 2.

105. Let us assume he had 100 goats in the beginning

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and p =10.
In Dec 98 he had how many goats - 100
In Jan 99, he added how much? - 10%
So how many does he have now? - 110
In Dec 99, how many goats? - 100
So how many did he sell? - 10
As a percentage how much is it? - 10 / 110 = 9.9 %.
So p > q.

106. Check for each of the options

	m/c A (700)	*m/c B* (1250)	Profit
1.	4*75+5*80	6*75+10*80	75*20+80*30
2.	4*100+5*60	6*100+10*60	100*20+60*30
3.	4*50+5*100	6*50+10*100	50*20+100*30
4.	4*60+5*90	6*60+10*90	60*20+90*30

Only opt. 1 does not violate time avail on both *m/c*

107. Such a function has its minimum value when one of the quantities inside the modulus function is zero.
Substitute x= 2, 2.5 and 3.6.
1. 0 + 0.5 + 1.6 = 2.1
2. 0.5 + 0 + 1.1 = 1.6
3. 1.6 + 1.1 + 0 = 2.7
So lowest is at x=2.5.

108. Let slow runner speed be x m / min
so fast runner speed be $2x$ m / min
1000 m / $(2x - x)$ = 5 = 200 m / min
So Faster runner speed = 400 m / min
Time taken for 4000 m = 4000/400= 10 min

109. Check each of the options – and their representation in each notation.

Base

	2	3	5
31	11111	1011	111
63	111111	2100	223
75	1001011	2210	300
91	1011011	10101	331

All odd numbers will end with 1 in base 2 – also they will start with base 1. Now if we look at the other condition, we have to find a number in which in exactly one of the bases, it starts with 1. Check with 91 – the notation in base 3 starts with 1, that in base 5 doesn't – so this is the answer.

110. Substitute the values for p, q, r in the options and check

111. There are 51 even integers but of these 112, 126, 140, ……..162, 180, 196 are divided by 7 (7 nos) out of these 108, 126, 144, …… 198, are divided 9 (6 nos) & 126, ……is divided by both 7 & 9 so answer is 51 – (7 + 6 -1) = 39.

112. If we consider the situation other wise, to satisfy condition 2, the first person must have 26 acquaintances, the second 25, third 24 and so on. If we continue, the last one should have 0 acquaintance, which is not possible.

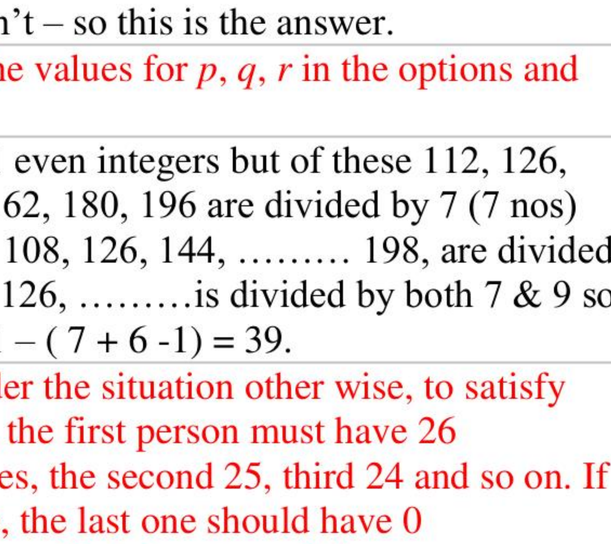
113. We have to check by substituting different values of X between 0& 5

X	$5 - X$	$X + 2$	max $(5-X, X + 2)$
0	5	2	5
1	4	3	4
2	3	4	4
3	2	5	5

Now value is between 1 & 2 so we check for 1.5

1.5	3.5	3.5	3.5

114.



$G + B = M$
$G \cap B \cap M = 6$
Only $G \cap M = 14 - 6 = 8$
Only $B \cap M = 2$
Only $B \cap G = 3$
No of projects > 1 consultant = 3 + 2 + 8 + 6 = 19
Total no. of project = 19 * 2 –1 = 37
$G + B + M$ + 19+ 37
So $G + B + M$ = 18----------1
Also $G + B = M$ +16 ------2
$G + B - M$ = 16. We get $G + B$ = 6 using 1 & 2 G + $B + M$ = 18. So M = 1 & $G + B$ = 17. So M = 1

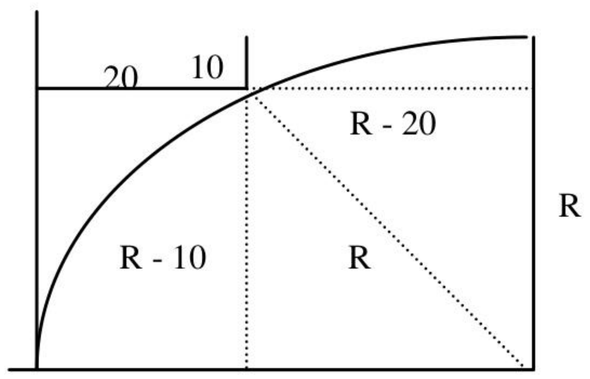
115. G cannot be determined uniquely

116. u is always negative. Hence, for us to have a minimum value of vz/u , vz should be positive. Also for the least value, the numerator has to be the maximum positive value and the denominator has to be the smallest negative value. In other words, vz has to be 2 and u has to be –0.5.
Hence the minimum value of vz/u = 2/-0.5 = –4.
For us to get the maximum value, vz has to be the smallest negative value and u has to be the highest negative value. Thus, vz has to be –2 and u has to be –0.5.
Hence the maximum value of vz/u = -2/-0.5 = 4.

117. The sum of would be min if each of the nos is equal to 1, in which case it is n.

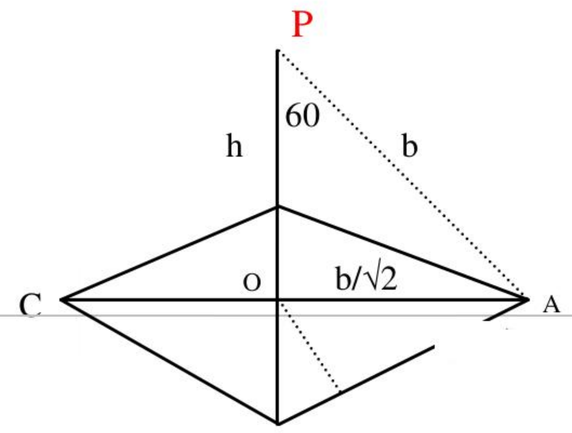
118. 1 + 3+ 6 + + 10 = 1 + (1 + 2) + (1+ 2+ 3+) + (1+ 2+ 3+ 4) + …(1..n)
$= \sum n\,(n+1)/2 = \frac{1}{2} \sum (n^2 + n)$.
$\frac{1}{2}\, n\,(n+1)(2n+1)/2 + \frac{1}{2} \,.\, n\,(n+1)/2 = 8436$.
Substitute each of the opts. ans is 36.

119.



$R^2 = (R - 10)^2 + (R - 20)^2$
or $R2 - 60R + 500 = 0$. R = 50 or R = 10
R can't be 10; because then there would be no circle

120. If ∠ APB = 60, then Δ APB is equilateral so AP = AB = b consider Δ OAP, side OA = b/ √2 and $OA^2 + OP^2 = AP^2$ => $(b/\sqrt{2})^2 + h^2 = b^2$ => $h^2 = b^2/2$ or $2h^2 = b^2$



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b

B

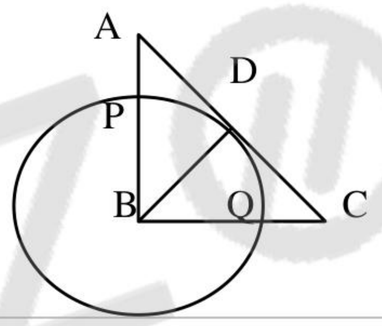
121. If y = 2 (it cannot be 0 or 1), then x can take 1 value and z can take 2 values.
Thus with y = 2, a total of 1 × 2 = 2 numbers can be
formed. With y = 3, 2 × 3 = 6 numbers can be formed.
Similarly checking for all values of y from 2 to 9 and
adding up we get the answer as 240.

122. Consider Δ AOB , 180 – (x + y)+ 2y +2y = 180
x + y = 4y Or x = 3y; k = 3

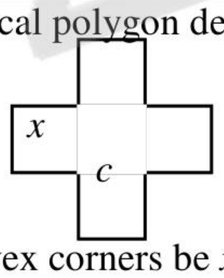
123. Substitute options and check
Opt 1 ; log 2, log 27 , log 57/2
Opt 2 ; log 11, log 2, log 25/2
Opt 3 ; log 2, log (not defined)
Opt 4; log 2, log 3, log 9/2 = log 2, 1, log 9 - log 2 = log 2, 1, 2- log 2 common difference is same between 2 terms, opt 4 is in AP

124. AB/PQ = BD /QD & CD/PQ = BD/ BQ
Combining the two we get
AB/CD = BD/QD * BQ / BD = BQ / QD = 3/1
So QD / BQ = 1/3 So BD / BQ = 4/3 OR 1 : 0.75

125. ABC is a a right Δ with area ½.6.8= 24
½.BD .10 = 24
BD = 4.8 So AD = 6 – 4.8 = 1.2
QC = 8 – 4.8 = 3.2
AP : QC = 1.2 : 3.2 = 3 : 8



126. Refer to a typical polygon described in the question.



Let no of convex corners be x. Let no of concave corners be c. We can see that $x - c = 4$. So for 25 convex corners, the number of concave corners must be 21.

127. Now $p^2 + q^2$ can be written as $(p+q)^2 - 2pq$
$= (\alpha - 2)^2 + 2(\alpha + 1) = \alpha^2 - 2\alpha + 6$
$= \alpha^2 - 2\alpha + 1 + 5 = (\alpha - 1)^2 + 5$ – Since a square can never be negative, the min value will be 5.

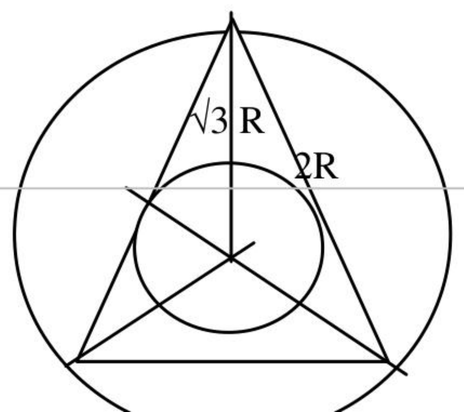
128.

1	– a –	1
2	– b –	2
3	– c –	3
4	– d –	4

1
3
6
10 (include the 4th alphabet)

what value of $\sum n$ is close to 288 (but < then that)
check n = 24, $\sum n = 12.25 = 300$
n = 23 $\sum n = 12.23 = 276$
so the 24th alphabet will be the 288th term.
So alphabet would be x

129. Base = $2\sqrt{3}\,R$ Ht = $R + 2R = 3R$
Area of Δ =
½. $2\sqrt{3}\,R.\,3R$
$= 3\sqrt{3}\,R^2$



R
√3 R 2R

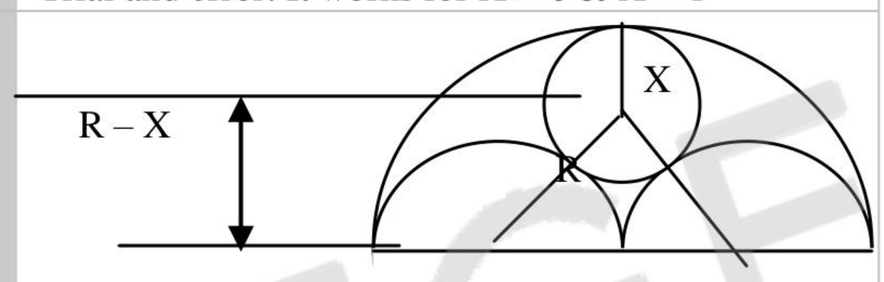
Now $4\pi R^2 = 12$
$R^2 = 3/\pi$
So area of $\Delta = 3\sqrt{3}.\,3/\pi$
$= 9\sqrt{3}/\pi$

130. Min positive integer is 1 So min $a + b + c + d = 5$
Now $a = b = c = 1$ and $d = 2$ satisfies above
In that case $a^2 + b^2 + c^2 + d^2 = 7$
RHS of opt. $1 \to 3$ $2 \to 7$
$3 \to 1$ $4 \to 7$
Ans is either 2 or 4. but if we take any of the integers as – ve, $a^2 + b^2 + c^2 + d^2$ will only ↑.
Therefore the correct answer is option 2.

131. Refer diagram Area (in question paper)
If X is the center of the hexagon,
Required area = ½ of area Δ AXF = ½ * 1/6 = 1/12

132. Trial and error. It works for X = 0 & X = 1

133.



If the radius of the field is r, then the total area of the field = $\pi r^2 / 2$
The radius of the semi-circles with centre's P and R = r/2

Hence, their total area = $\pi r^2 / 4$

Let the radius if the circle with centre S be x.

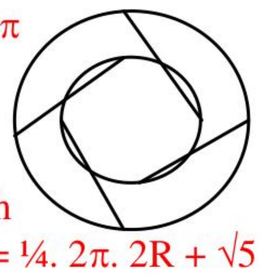
$(r - x)^2 + (r/2)^2 = (r/2 + x)^2 \Rightarrow x = r/3$.

Thus the area of the circle with centre S = $\pi r^2 / 9$
The total area that can be grazed = $\pi r^2 / 9$ (1/4 + 1/9) = $13\,\pi r^2 / 36$

Thus the fraction of the field that can be grazed =
$\frac{26}{36} \times \frac{\text{Area that can be grazed}}{\text{Area of the field}}$

The fraction that cannot be grazed = 10/36
= 28% (approx.)

134. Lengths are OR → 30 π. IR→ 20 π
chord→15√15.
Let inner radius be R .
Outer radius will be 2R.
Each chord road will have a length
= √5 R. Length covered by Amit = ¼. 2π. 2R + √5 R = πR + √5 R . Time taken = πR/ 30π + √5 R/ 15 √5 = 3/2. So R = 15km. Outer road radius = 2 R = 30km.



135. Time taken = r/20 + r/15 = 7r/60. Since r=15, total time = 105 min (1.75hr)

136. Sum of all cords = 4 * √5 R length of cord = 2π * 2R so ratio is 4√5 : 4π = √5 : π

137. (n-1!) is not divisible by n when n is prime, so basically we are looking at primes between 12 and

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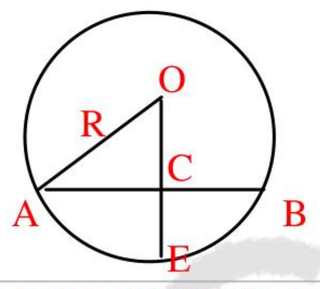
	40 – 13, 17, 19, 23, 29, 31, 37.
138.	Let us substitute $X = 1$ $Y = 1$ $Z = 1$ then term = 6. If they are different then it would be more tha 6.
139.	For J= 3, there are 2^{n-3} students who answered 3 or more questions wrong So $J = 0$, there are two students who answered wrong or more questions wrong. So $(2^n – 2^{n-1})$ Answer 0 wrong $(2^n – 2^{n-2})$ Answer 0 wrong. $(2^n – 2^{n-0})$ Answer 0 wrong. Total no. of wrong answers is - $1 (2^{n-1} - 2^{n-2}) + 2 (2^{n-2} – 2^{n-3}) + 3 (2^{n-3} - 2^{n-4}) +$ …….. $n (2 – 1). 2^{n-1} + 2^{n-2} + 2^{n-3} +$ …… $1 + 1 =$ 4095 GP with sum 1. $(2^n – 1)/2-1 = 4095$. $2^n – 1 =$ 4095. $2^n = 4096 = 2^{12}$. So $n = 12$
140.	They intersect when both Y are equal $X^3 + X^2 + 5 = X^2 + X + 5$. => $X^3 = X$. => $X = 0$ is a Solution, $X = 1$ is a Solution, X= -1 is a soln
141.	Let n be the number of elements in T. $467 = 3 + (n – 1) 8$. n – a = 464/8 + 1 = 59 terms. Sum of the first and the last term is 470. (2^{nd} and 2^{nd} last also etc.) The middle term is the 30^{th} any sum of the 1^{st} 30 or the last 30 terms will not yield 470.
142.	The least number of edges will be when one point is connected to each of the other 11 points, giving a total of 11 lines. One can move from any point to any other point via the common point. The maximum edges will be when a line exists between any two points. max no. of edge = $12C_2 = 12 * 11/2 = 66$
143.	1 consecutive ball can be placed in 6 ways 2 in 5 ways, 3 in 4 ways, 4 in 3 ways, 5 in 2 ways and 6 in 1 way.

	So total no of ways is $\sum 6 = 6 * 7/2 = 21$.
144.	Total purchase price for 3 bottles= 520 + 2 * 520 * 0.7 = 520 * 2.4 = 1248 baht. Thus each person has to pay 416 bahts each. R pays 2* 46 = 92 bahts M pays 4 * 46 + 27 = 211bahts. Since M has paid 415 -211 = 204 less thus in dollars it would be 5 $.
145.	R has paid 92 bahts, so he paid 416 – 92 = 324 baht
146.	Now if $16 = 2^4$ So b^{11} is definitely greater than 244 if b is greater than 16. Stmt. B alone is enough.
147.	Substitute –1/2 in the eq^n 4 * ¼ - b / 2 + $c = 0$. So $b – 2c = 2$-------- equation we need one more eqn to get unique values of b & c either of the statements can provide that equation. So Ans. is 2
148.	Statement 1 does not give any useful information. Let the radius be R. We know AC is 2.5. Using segment B we can get $OC = R$-5, so we can then apply Pythagoras theorem and solve for R. Ans. is 1. 
149.	In case a is –ve, LHS > RHS. If a is +ve (>1), LHS < RHS. A is not sufficient, but B gives a as 1/2 so it alone is sufficient.
150.	Area of DEF = ¼ (Area of ABC) stmt A gives us the sides of triangle ADF. Whose area will be same as DEF stmt B gives us sides of ABC, so area of ABC can be calculated. Either stmt is enough.

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