

General Instructions

- (i) This booklet contains 50 questions, each provided with a complete, step-by-step solution.
- (ii) It comprises 50 single-correct multiple-choice questions.
- (iii) Attempt each question on your own before reviewing the given solution.

1. If $\frac{a}{b} = \frac{1}{3}$, $\frac{b}{c} = \frac{2}{2}$, $\frac{c}{d} = \frac{1}{2}$, $\frac{d}{e} = \frac{3}{3}$ and $\frac{e}{f} = \frac{1}{4}$, then what is the value of $\frac{abc}{def}$?

- (A) $3/8$
- (B) $27/8$
- (C) $3/4$
- (D) $27/4$

Correct Answer: (A) $3/8$

SOLUTION:

Quick Tip: In ratio chain problems, always try to express every variable in terms of a single common variable to avoid confusion during substitution.

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2. If $x = -0.5$, then which of the following has the smallest value?

- (A) 2^x
- (B) $1/x$
- (C) $1/x^2$
- (D) $2x^x$

Correct Answer: (B) $1/x$

SOLUTION:

Quick Tip: For questions asking for the "smallest" value with negative inputs, look for expressions that result in negative numbers first, as they will always be smaller than positive results.

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3. Which among $2^{1/2}$, $3^{1/3}$, $4^{1/4}$, $6^{1/6}$ and $12^{1/12}$ is the largest?

- (A) $2^{1/2}$
- (B) $3^{1/3}$
- (C) $4^{1/4}$
- (D) $6^{1/6}$

Correct Answer: (B) $3^{1/3}$

SOLUTION:

Quick Tip: The function $f(x) = x^{1/x}$ increases until $x = e \approx 2.718$ and then decreases. Since 3 is the integer closest to e , $3^{1/3}$ is the largest among such terms.

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4. Consider a sequence where the n th term, $t_n = \frac{n}{n+2}$, $n = 1, 2, \dots$. The value of $t_3 \times t_4 \times t_5 \times \dots \times t_{53}$ equals:

- (A) $2/495$
- (B) $2/477$
- (C) $12/55$
- (D) $1/1485$

Correct Answer: (A) $2/495$

SOLUTION:

Quick Tip: In a telescoping product $\frac{n}{n+k}$, the number of terms remaining at the start and end is equal to the difference k . Here $k = 2$, so two terms remain on top and two on the bottom.

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5. When you reverse the digits of the number 13, the number increases by 18. How many other two-digit numbers increase by 18 when their digits are reversed?

- (A) 5
- (B) 6
- (C) 7
- (D) 8

Correct Answer: (B) 6

SOLUTION:

Quick Tip: The difference between a two-digit number and its reverse is always a multiple of 9. Specifically, $|(10x + y) - (10y + x)| = 9|x - y|$.

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6.

Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

- (A) 20
- (B) 25
- (C) 30
- (D) 40

Correct Answer: (B) 25

SOLUTION:

Quick Tip: When solving age problems with percentages, it is often easiest to assume a base value like 100 for one of the people to make the calculations concrete.

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7. The ratio of two numbers is 3 : 5. If 39 is added to the first, and 14 is added to the second, then the ratio becomes 6 : 7. What will be the ratio if 11 is added to the first number and 6 is added to the second number?

- (A) 7 : 9
- (B) 5 : 9
- (C) 5 : 7
- (D) 2 : 3

Correct Answer: (D) 2 : 3

SOLUTION:

Quick Tip: When simplifying ratios like 74:111, if you can't see the common factor immediately, try checking if they are multiples of prime numbers like 31, 37, or 41.

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8. In an election between two candidates, the winner got 56% of the total valid votes and won by 4,800 votes. If all votes were valid, how many people voted?

- (A) 36,000
- (B) 40,000
- (C) 42,000
- (D) 48,000

Correct Answer: (B) 40,000

SOLUTION:

Step 1: The winner's margin over the loser is $56\% - 44\% = 12\%$ of the total votes.

Step 2: So 12% of the total = 4800 $\Rightarrow$ Total = $\frac{4800}{0.12} = 40000$.

Quick Tip: A win-by margin is the difference of the two percentages, not the winner's share.

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9. The price of sugar rises by 25%. By what percentage must a family reduce its consumption so that the total expenditure on sugar stays the same?

- (A) 20%
- (B) 25%
- (C) 16.67%
- (D) 22%

Correct Answer: (A) 20%

SOLUTION:

Step 1: If price becomes 1.25 times, consumption must become $\frac{1}{1.25} = 0.8$ times to keep spend fixed.

Step 2: Reduction = $1 - 0.8 = 0.20 = 20\%$.

Quick Tip: A r rise needs a $\frac{r}{100 + r} \times 100\%$ cut: here $\frac{25}{125} \times 100 = 20\%$.

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10. A number is first increased by 20% and the result is then decreased by 20%. The final value is what percent of the original?

- (A) 100%
- (B) 96%
- (C) 98%
- (D) 104%

Correct Answer: (B) 96%

SOLUTION:

Step 1: Successive change factor = $1.20 \times 0.80 = 0.96$.

Step 2: So the final value is 96% of the original, a net 4% fall.

Quick Tip: Equal up-then-down changes of $x\%$ always leave a net fall of $\frac{x^2}{100}\%$.

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11. Two numbers are in the ratio 5 : 8. If 9 is added to each, the ratio becomes 8 : 11. Find the larger number.

- (A) 15
- (B) 24
- (C) 40
- (D) 30

Correct Answer: (B) 24

SOLUTION:

Step 1: Let the numbers be $5x$ and $8x$. Then $\frac{5x + 9}{8x + 9} = \frac{8}{11}$.

Step 2: $11(5x + 9) = 8(8x + 9) \Rightarrow 55x + 99 = 64x + 72 \Rightarrow 9x = 27 \Rightarrow x = 3$.

Step 3: Larger number = $8x = 24$.

Quick Tip: Introduce a single variable x for the common ratio unit, then form one equation.

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12. If $A : B = 3 : 4$ and $B : C = 6 : 5$, then $A : B : C$ equals:

- (A) $9 : 12 : 10$
- (B) $3 : 4 : 5$
- (C) $9 : 24 : 20$
- (D) $6 : 8 : 5$

Correct Answer: (A) $9 : 12 : 10$

SOLUTION:

Step 1: Make B common. $A : B = 3 : 4 = 9 : 12$ (times 3); $B : C = 6 : 5 = 12 : 10$ (times 2).

Step 2: Hence $A : B : C = 9 : 12 : 10$.

Quick Tip: To chain ratios, scale each so the shared term (here B) has the same value.

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13. An amount of Rs. 7,800 is divided among A, B and C in the ratio $2 : 3 : 8$. How much does C receive?

- (A) Rs. 1,200
- (B) Rs. 1,800
- (C) Rs. 4,800
- (D) Rs. 3,600

Correct Answer: (C) Rs. 4,800

SOLUTION:

Step 1: Total ratio units = $2 + 3 + 8 = 13$; each unit = $\frac{7800}{13} = 600$.

Step 2: C's share = $8 \times 600 = \text{Rs. } 4800$.

Quick Tip: Sum the ratio parts first; one 'unit' equals total divided by that sum.

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14. The ratio of milk to water in a 60-litre mixture is 7 : 3. How much water must be added to make the ratio 7 : 4?

- (A) 6 litres
- (B) 10 litres
- (C) 4 litres
- (D) 8 litres

Correct Answer: (A) 6 litres

SOLUTION:

Step 1: Milk = $\frac{7}{10} \times 60 = 42$ L, Water = 18 L.

Step 2: Milk stays 42 L. For ratio 7 : 4, water = $\frac{4}{7} \times 42 = 24$ L.

Step 3: Water to add = $24 - 18 = 6$ L.

Quick Tip: When only water is added, keep the milk quantity fixed and re-solve for water.

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15. A shopkeeper buys an article for Rs. 480 and sells it for Rs. 600. What is his profit percentage?

- (A) 20%
- (B) 25%
- (C) 30%
- (D) 24%

Correct Answer: (B) 25%

SOLUTION:

Step 1: Profit = $600 - 480 = 120$.

Step 2: Profit\% = $\frac{120}{480} \times 100 = 25\%$.

Quick Tip: Profit percent is always taken on the cost price, not the selling price.

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16. By selling an article for Rs. 720, a man loses 10%. At what price should he sell it to gain 20%?

- (A) Rs. 960
- (B) Rs. 864
- (C) Rs. 900
- (D) Rs. 800

Correct Answer: (A) Rs. 960

SOLUTION:

Step 1: SP at 10% loss = $0.9 \times CP = 720 \Rightarrow CP = 800$.

Step 2: SP for 20% gain = $1.2 \times 800 = \text{Rs. } 960$.

Quick Tip: Recover the cost price from the given SP first, then apply the new profit rate.

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17. A trader marks his goods 40% above cost and allows a discount of 25% on the marked price. His profit percentage is:

- (A) 5%
- (B) 10%
- (C) 15%
- (D) 12%

Correct Answer: (A) 5%

SOLUTION:

Step 1: Let $CP = 100$. Marked price = 140.

Step 2: $SP = 140 \times (1 - 0.25) = 105$.

Step 3: Profit\% = $105 - 100 = 5\%$.

Quick Tip: Take CP as 100, apply markup then discount as multipliers to read profit directly.

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18. A man sells two articles at Rs. 990 each. On one he gains 10% and on the other he loses 10%. His overall result is:

- (A) Loss of 1%
- (B) No profit no loss
- (C) Gain of 1%
- (D) Loss of 2%

Correct Answer: (A) Loss of 1%

SOLUTION:

Step 1: Equal SP with +10% and -10% always gives a net loss of $\frac{10^2}{100}\%$ = 1%.

Step 2: Check: CP1 = 900, CP2 = 1100; total CP = 2000, total SP = 1980 $\Rightarrow$ loss 20 on 2000 = 1%.

Quick Tip: Selling two items at the same price with $\pm x\%$ gives a fixed loss of $\frac{x^2}{100}\%$.

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19. The average of 11 numbers is 50. If one number 65 is removed, the average of the remaining 10 numbers is:

- (A) 48.5
- (B) 50
- (C) 46
- (D) 55

Correct Answer: (A) 48.5

SOLUTION:

Step 1: Total of 11 numbers = $11 \times 50 = 550$.

Step 2: After removing 65: sum = 485, average = $\frac{485}{10} = 48.5$.

Quick Tip: Work with the total (average times count), adjust it, then divide by the new count.

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20. The average age of 30 students is 12 years. If the teacher's age is included, the average rises by 1 year. The teacher's age is:

- (A) 43 years
- (B) 42 years
- (C) 40 years
- (D) 31 years

Correct Answer: (A) 43 years

SOLUTION:

Step 1: Sum of students' ages = $30 \times 12 = 360$.

Step 2: With the teacher, 31 people average 13: total = $31 \times 13 = 403$.

Step 3: Teacher's age = $403 - 360 = 43$.

Quick Tip: A newcomer's value = new total minus old total.

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21. In what ratio must rice at Rs. 30/kg be mixed with rice at Rs. 45/kg to get a mixture worth Rs. 35/kg?

- (A) 2 : 1
- (B) 1 : 2
- (C) 3 : 2
- (D) 1 : 1

Correct Answer: (A) 2 : 1

SOLUTION:

Step 1: By alligation, ratio = $(45 - 35) : (35 - 30) = 10 : 5 = 2 : 1$.

Step 2: So cheaper : dearer = 2 : 1.

Quick Tip: Alligation ratio = (dearer - mean) : (mean - cheaper).

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22. A car covers 240 km in 4 hours. Travelling at the same speed, how far will it go in 7 hours?

- (A) 360 km
- (B) 420 km
- (C) 400 km
- (D) 480 km

Correct Answer: (B) 420 km

SOLUTION:

Step 1: Speed = $\frac{240}{4} = 60$ km/h.

Step 2: Distance in 7 h = $60 \times 7 = 420$ km.

Quick Tip: Find the unit speed first, then scale to the required time.

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23. A train 150 m long is running at 72 km/h. How long does it take to cross a platform 250 m long?

- (A) 20 s
- (B) 18 s
- (C) 25 s
- (D) 22 s

Correct Answer: (A) 20 s

SOLUTION:

Step 1: Speed = $72 \times \frac{5}{18} = 20$ m/s.

Step 2: Total distance to cross = $150 + 250 = 400$ m.

Step 3: Time = $\frac{400}{20} = 20$ s.

Quick Tip: To cross a platform, distance = train length + platform length.

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24. A man covers a distance at 40 km/h and returns along the same road at 60 km/h. His average speed for the whole journey is:

- (A) 48 km/h
- (B) 50 km/h
- (C) 45 km/h
- (D) 52 km/h

Correct Answer: (A) 48 km/h

SOLUTION:

Step 1: For equal distances, average speed = $\frac{2ab}{a+b}$ (harmonic mean).

Step 2: = $\frac{2 \times 40 \times 60}{40 + 60} = \frac{4800}{100} = 48$ km/h.

Quick Tip: Equal-distance average speed is the harmonic mean, never the plain average.

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25. A boat goes 30 km downstream in 2 hours and returns the same distance upstream in 3 hours. The speed of the stream is:

- (A) 2.5 km/h
- (B) 5 km/h
- (C) 2 km/h
- (D) 3 km/h

Correct Answer: (A) 2.5 km/h

SOLUTION:

Step 1: Downstream speed = $\frac{30}{2} = 15$ km/h; upstream = $\frac{30}{3} = 10$ km/h.

Step 2: Stream speed = $\frac{15 - 10}{2} = 2.5$ km/h.

Quick Tip: Stream speed = (downstream - upstream) / 2.

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26. A can do a piece of work in 12 days and B in 18 days. Working together, they finish it in:

- (A) 7.2 days
- (B) 7.5 days
- (C) 6 days
- (D) 8 days

Correct Answer: (A) 7.2 days

SOLUTION:

Step 1: One day's work = $\frac{1}{12} + \frac{1}{18} = \frac{3+2}{36} = \frac{5}{36}$.

Step 2: Time together = $\frac{36}{5} = 7.2$ days.

Quick Tip: Add per-day rates, then invert the sum to get the combined time.

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27. 15 men can build a wall in 8 days. How many days will 10 men take to build the same wall?

- (A) 12 days
- (B) 10 days
- (C) 16 days
- (D) 6 days

Correct Answer: (A) 12 days

SOLUTION:

Step 1: Total work = $15 \times 8 = 120$ man-days.

Step 2: With 10 men: days = $\frac{120}{10} = 12$.

Quick Tip: Men and days are inversely proportional; the product (man-days) is constant.

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28. A and B together do a work in 12 days; B alone does it in 20 days. In how many days can A alone do it?

- (A) 30 days
- (B) 24 days
- (C) 15 days
- (D) 36 days

Correct Answer: (A) 30 days

SOLUTION:

Step 1: A's one day work = $\frac{1}{12} - \frac{1}{20} = \frac{5-3}{60} = \frac{2}{60} = \frac{1}{30}$.

Step 2: So A alone takes 30 days.

Quick Tip: Subtract the known rate from the combined rate to isolate the other worker.

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29. Find the simple interest on Rs. 6,000 at 8% per annum for 3 years.

- (A) Rs. 1,440
- (B) Rs. 1,600
- (C) Rs. 1,200
- (D) Rs. 1,800

Correct Answer: (A) Rs. 1,440

SOLUTION:

Step 1: $SI = \frac{P \cdot R \cdot T}{100} = \frac{6000 \times 8 \times 3}{100}$.

Step 2: $= \frac{144000}{100} = \text{Rs. } 1440$.

Quick Tip: Simple interest grows linearly: $SI = \frac{PRT}{100}$.

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30. The compound interest on Rs. 8,000 at 10% per annum for 2 years (compounded annually) is:

- (A) Rs. 1,680
- (B) Rs. 1,600
- (C) Rs. 1,760
- (D) Rs. 800

Correct Answer: (A) Rs. 1,680

SOLUTION:

Step 1: Amount = $8000 \left(1 + \frac{10}{100}\right)^2 = 8000 \times 1.21 = 9680$.

Step 2: $CI = 9680 - 8000 = \text{Rs. } 1680$.

Quick Tip: $CI = P \left[\left(1 + \frac{R}{100}\right)^T - 1 \right]$; subtract the principal at the end.

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31. A sum doubles itself in 8 years at simple interest. The annual rate of interest is:

- (A) 12.5%
- (B) 10%
- (C) 8%
- (D) 15%

Correct Answer: (A) 12.5%

SOLUTION:

Step 1: Doubling means $SI = P$. So $P = \frac{P \cdot R \cdot 8}{100}$.

Step 2: $100 = 8R \Rightarrow R = 12.5\%$.

Quick Tip: To multiply a sum n times by SI, interest earned = $(n - 1)P$.

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32. The sum of the digits of a two-digit number is 9. When the digits are reversed, the number decreases by 27. Find the original number.

- (A) 63
- (B) 54
- (C) 72
- (D) 36

Correct Answer: (A) 63

SOLUTION:

Step 1: Let the number be $10a + b$ with $a + b = 9$.

Step 2: Reversed number is smaller by 27: $(10a + b) - (10b + a) = 27$
 $\Rightarrow 9(a - b) = 27 \Rightarrow a - b = 3$.

Step 3: Solving $a + b = 9$, $a - b = 3$: $a = 6$, $b = 3$; number = 63.

Quick Tip: Reversing a two-digit number changes it by $9(a - b)$.

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33. How many numbers between 1 and 200 are divisible by both 6 and 8?

- (A) 8
- (B) 6
- (C) 12
- (D) 4

Correct Answer: (A) 8

SOLUTION:

Step 1: Divisible by both 6 and 8 means divisible by $\text{LCM}(6, 8) = 24$.

Step 2: Multiples of 24 up to 200: 24, 48, ..., 192, i.e. $\lfloor 200/24 \rfloor = 8$ numbers.

Quick Tip: Divisible by two numbers = divisible by their LCM.

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34. The HCF of two numbers is 12 and their LCM is 144. If one number is 36, the other number is:

- (A) 48
- (B) 60
- (C) 24
- (D) 72

Correct Answer: (A) 48

SOLUTION:

Step 1: Product of numbers = HCF $\times$ LCM = $12 \times 144 = 1728$.

Step 2: Other number = $\frac{1728}{36} = 48$.

Quick Tip: $\text{Number}_1 \times \text{Number}_2 = \text{HCF} \times \text{LCM}$.

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35. What is the remainder when 2^{31} is divided by 7?

- (A) 1
- (B) 2
- (C) 4
- (D) 0

Correct Answer: (B) 2

SOLUTION:

Step 1: Powers of 2 modulo 7 repeat every 3 steps: $2^1 \equiv 2$, $2^2 \equiv 4$, $2^3 \equiv 1$.

Step 2: $31 = 3 \times 10 + 1$, so $2^{31} \equiv (2^3)^{10} \cdot 2^1 \equiv 1 \cdot 2 \equiv 2 \pmod{7}$.

Quick Tip: Find the cycle length of the remainders, then reduce the exponent modulo that length.

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36. If $x + \frac{1}{x} = 5$, then the value of $x^2 + \frac{1}{x^2}$ is:

- (A) 23
- (B) 25
- (C) 27
- (D) 21

Correct Answer: (A) 23

SOLUTION:

Step 1: Square both sides: $\left(x + \frac{1}{x}\right)^2 = x^2 + 2 + \frac{1}{x^2} = 25$.

Step 2: So $x^2 + \frac{1}{x^2} = 25 - 2 = 23$.

Quick Tip: $x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2$.

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37. The sum of two numbers is 15 and the sum of their squares is 113. The product of the two numbers is:

- (A) 56
- (B) 48
- (C) 60
- (D) 52

Correct Answer: (A) 56

SOLUTION:

Step 1: $(a + b)^2 = a^2 + b^2 + 2ab \Rightarrow 15^2 = 113 + 2ab$.

Step 2: $225 - 113 = 2ab \Rightarrow ab = \frac{112}{2} = 56$.

Quick Tip: Use $2ab = (a + b)^2 - (a^2 + b^2)$ to get the product without finding the numbers.

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38. If $3x - 2y = 5$ and $x + y = 5$, then the value of x is:

- (A) 3
- (B) 2
- (C) 4
- (D) 1

Correct Answer: (A) 3

SOLUTION:

Step 1: From $x + y = 5$, $y = 5 - x$. Substitute: $3x - 2(5 - x) = 5$.

Step 2: $3x - 10 + 2x = 5 \Rightarrow 5x = 15 \Rightarrow x = 3$.

Quick Tip: Substitution turns two equations into one in a single unknown.

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39. Simplify: $\frac{2}{3}$ of $45 + 25\%$ of $80 - 12$.

- (A) 38
- (B) 40
- (C) 30
- (D) 42

Correct Answer: (A) 38

SOLUTION:

Step 1: $\frac{2}{3} \times 45 = 30$; $25\% \times 80 = 20$.

Step 2: $30 + 20 - 12 = 38$.

Quick Tip: Follow BODMAS: evaluate 'of' and % parts before adding or subtracting.

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40. Find the sum of the first 20 terms of the arithmetic progression 3, 7, 11, 15, ...

- (A) 820
- (B) 800
- (C) 840
- (D) 780

Correct Answer: (A) 820

SOLUTION:

Step 1: Here $a = 3$, $d = 4$, $n = 20$. Sum $= \frac{n}{2} [2a + (n - 1)d]$.

Step 2: $= \frac{20}{2} [6 + 19 \times 4] = 10 \times 82 = 820$.

Quick Tip: AP sum $= \frac{n}{2} [2a + (n - 1)d]$.

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41. The third term of a GP is 12 and the sixth term is 96. The first term is:

- (A) 3
- (B) 2
- (C) 4
- (D) 6

Correct Answer: (A) 3

SOLUTION:

Step 1: $\frac{ar^5}{ar^2} = \frac{96}{12} = 8 \Rightarrow r^3 = 8 \Rightarrow r = 2.$

Step 2: $ar^2 = 12 \Rightarrow a \times 4 = 12 \Rightarrow a = 3.$

Quick Tip: Divide two term-equations to eliminate a and solve for the ratio r first.

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42. What is the value of the sum $\frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \frac{1}{3 \cdot 4} + \cdots + \frac{1}{9 \cdot 10}$?

- (A) 9/10
- (B) 1/10
- (C) 10/11
- (D) 8/9

Correct Answer: (A) 9/10

SOLUTION:

Step 1: Each term telescopes: $\frac{1}{k(k+1)} = \frac{1}{k} - \frac{1}{k+1}.$

Step 2: Sum $= 1 - \frac{1}{10} = \frac{9}{10}.$

Quick Tip: Split $\frac{1}{k(k+1)}$ into partial fractions so consecutive terms cancel.

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43. The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$ (continued infinitely) is:

- (A) 3
- (B) 2
- (C) 6
- (D) 4

Correct Answer: (A) 3

SOLUTION:

Step 1: Let $x = \sqrt{6 + x}$. Squaring: $x^2 = 6 + x$.

Step 2: $x^2 - x - 6 = 0 \Rightarrow (x - 3)(x + 2) = 0$; taking the positive root, $x = 3$.

Quick Tip: For an infinite nested radical, set the whole expression equal to x and solve.

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44. If $2^x = 8^{y+1}$ and $9^y = 3^{x-9}$, then the value of x is:

- (A) 21
- (B) 18
- (C) 24
- (D) 15

Correct Answer: (A) 21

SOLUTION:

Step 1: $2^x = 2^{3(y+1)} \Rightarrow x = 3y + 3$.

Step 2: $3^{2y} = 3^{x-9} \Rightarrow 2y = x - 9$. Substitute $x = 3y + 3$: $2y = 3y - 6$
 $\Rightarrow y = 6$.

Step 3: So $x = 3(6) + 3 = 21$.

Quick Tip: Rewrite both sides with the same base, then equate the exponents.

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45. In how many ways can the letters of the word 'LEADER' be arranged?

- (A) 360
- (B) 720
- (C) 120
- (D) 180

Correct Answer: (A) 360

SOLUTION:

Step 1: 'LEADER' has 6 letters with E repeated twice.

Step 2: Arrangements $= \frac{6!}{2!} = \frac{720}{2} = 360$.

Quick Tip: Divide $n!$ by the factorial of each repeated letter's count.

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46. Two dice are thrown together. What is the probability that the sum of the numbers is 8?

- (A) $5/36$
- (B) $1/6$
- (C) $1/9$
- (D) $7/36$

Correct Answer: (A) $5/36$

SOLUTION:

Step 1: Total outcomes = 36. Sum = 8 occurs for (2, 6), (3, 5), (4, 4), (5, 3), (6, 2) — 5 ways.

Step 2: Probability = $\frac{5}{36}$.

Quick Tip: List the favourable ordered pairs carefully; (a, b) and (b, a) are distinct on two dice.

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47. A company sold 1,200, 1,500, 900 and 1,400 units over four quarters. What is the average quarterly sales?

- (A) 1,250
- (B) 1,200
- (C) 1,300
- (D) 1,000

Correct Answer: (A) 1,250

SOLUTION:

Step 1: Total = $1200 + 1500 + 900 + 1400 = 5000$.

Step 2: Average = $\frac{5000}{4} = 1250$ units.

Quick Tip: Average from a table = sum of the row divided by the number of entries.

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48. In a survey of 800 people, 45% preferred tea and the rest preferred coffee. How many more people preferred coffee than tea?

- (A) 80
- (B) 120
- (C) 40
- (D) 360

Correct Answer: (A) 80

SOLUTION:

Step 1: Tea = $45\% \times 800 = 360$; Coffee = $55\% \times 800 = 440$.

Step 2: Difference = $440 - 360 = 80$.

Quick Tip: 'The rest' means 100% minus the given percentage.

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49. A and B start a business investing Rs. 25,000 and Rs. 35,000 respectively. If the annual profit is Rs. 24,000, B's share is:

- (A) Rs. 14,000
- (B) Rs. 10,000
- (C) Rs. 12,000
- (D) Rs. 16,000

Correct Answer: (A) Rs. 14,000

SOLUTION:

Step 1: Profit-sharing ratio = 25000 : 35000 = 5 : 7; total = 12 parts.

Step 2: B's share = $\frac{7}{12} \times 24000 = \text{Rs. } 14000$.

Quick Tip: With equal time periods, profit splits in the ratio of the capitals.

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50. The ratio of the present ages of a father and son is 7 : 2. After 10 years, the ratio becomes 9 : 4. The present age of the father is:

- (A) 35 years
- (B) 42 years
- (C) 28 years
- (D) 40 years

Correct Answer: (A) 35 years

SOLUTION:

Step 1: Let ages be $7x$ and $2x$. After 10 years: $\frac{7x + 10}{2x + 10} = \frac{9}{4}$.

Step 2: $4(7x + 10) = 9(2x + 10) \Rightarrow 28x + 40 = 18x + 90 \Rightarrow 10x = 50$
 $\Rightarrow x = 5$.

Step 3: Father's present age = $7x = 35$ years.

Quick Tip: Add the same time to every age, then re-apply the new ratio.