

ATMA Quantitative Skills Sample Paper – 8

Duration: 60 Minutes

Maximum Marks: 60

Instructions

- This paper contains **60** Multiple Choice Questions (Single Correct Answer) arranged in **two parts (Part I: Q1–Q30, Part II: Q31–Q60)**, modelled on the Quantitative Skills portion of **ATMA** (AIMS Test for Management Admissions).
- Each correct answer carries **+1 marks**. There is a **penalty of 0.25 mark** for each incorrect answer, while unattempted questions earn **0**.
- Only **one** option is correct. Choose carefully.
- Syllabus level: **Quantitative aptitude (arithmetic, algebra, geometry, modern maths, data interpretation)**
- Use of mobile phones, calculators, or electronic gadgets is strictly prohibited.

Part I (Q1–Q30)

Q1. The unit digit of 7^{95} is

- (A) 9
- (B) 3
- (C) 7
- (D) 1

Q2. The HCF of two numbers is 13 and their LCM is 455. If one of the numbers is 65, the other number is

- (A) 78
- (B) 104



(C) 91

(D) 52

Q3. The population of a town increases by 10% in the first year and by 20% in the second year. If the present population is 1,32,000, the population two years ago was

(A) 1,00,000

(B) 1,10,000

(C) 1,20,000

(D) 96,000

Q4. In an examination, 40% of the candidates failed in Mathematics and 30% failed in English. If 15% failed in both subjects, the percentage of candidates who passed in both subjects is

(A) 30%

(B) 40%

(C) 55%

(D) 45%

Q5. Three partners P, Q and R invest in a business in the ratio 5 : 7 : 8. At the end of the year the total profit is Rs. 40,000. R's share (in Rupees) is

(A) 14,000

(B) 16,000

(C) 10,000

(D) 20,000

Q6. The average age of a class of 30 students is 14 years. When the teacher's age is included, the average rises to 15 years. The age of the teacher (in years) is

(A) 30



- (B) 44
- (C) 45
- (D) 40

Q7. By selling an article for Rs. 720, a man loses 10%. To gain 20%, he should sell it for (in Rupees)

- (A) 960
- (B) 900
- (C) 880
- (D) 1000

Q8. A shopkeeper marks his goods 40% above the cost price and then allows a discount of 25%. His profit percentage is

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

Q9. At what rate percent per annum simple interest will a sum of money double itself in 8 years?

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

Q10. Two trains of lengths 120 m and 180 m are running on parallel tracks in opposite directions at 54 km/h and 36 km/h respectively. The time (in seconds) they take to cross each other is

- (A) 12



- (B) 15
- (C) 10
- (D) 18

Q11. A boat goes 24 km downstream in 3 hours and the same distance upstream in 4 hours. The speed of the stream (in km/h) is

- (A) 2
- (B) 0.5
- (C) 1
- (D) 1.5

Q12. A and B together can do a piece of work in 12 days, B and C together in 15 days, and C and A together in 20 days. The number of days A alone takes to finish the work is

- (A) 24
- (B) 30
- (C) 40
- (D) 20

Q13. Two pipes A and B can fill a tank in 20 minutes and 30 minutes respectively. If both pipes are opened together, the time (in minutes) taken to fill the tank is

- (A) 12
- (B) 10
- (C) 15
- (D) 25

Q14. The cost of 3 pens and 4 pencils is Rs. 50, and the cost of 5 pens and 2 pencils is Rs. 60. The cost of one pen (in Rupees) is

- (A) 6



- (B) 12
- (C) 8
- (D) 10

Q15. If α and β are the roots of $2x^2 - 5x + 3 = 0$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is

- (A) $\frac{2}{3}$
- (B) $\frac{3}{5}$
- (C) $\frac{5}{3}$
- (D) $\frac{5}{2}$

Q16. The solution set of the inequality $3x - 7 < 5x + 3$ is

- (A) $x < -5$
- (B) $x > -5$
- (C) $x > 5$
- (D) $x < 5$

Q17. The sum of the first 20 terms of the arithmetic progression 3, 7, 11, 15, ... is

- (A) 800
- (B) 760
- (C) 880
- (D) 820

Q18. In how many ways can the letters of the word "LEADER" be arranged?

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



(D) 480

Q19. A committee of 3 men and 2 women is to be formed from 5 men and 4 women. The number of ways of forming the committee is

(A) 40

(B) 120

(C) 60

(D) 90

Q20. A bag contains 4 red and 6 green balls. Two balls are drawn at random. The probability that both are green is

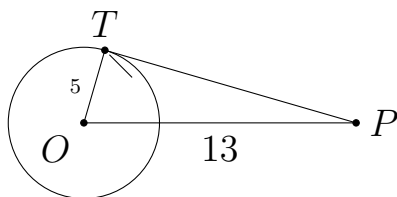
(A) $\frac{2}{15}$

(B) $\frac{1}{3}$

(C) $\frac{3}{5}$

(D) $\frac{2}{5}$

Q21. In the figure, PT is a tangent from an external point P to a circle with centre O and radius 5 cm. If $OP = 13$ cm, the length of the tangent PT (in cm) is



(A) 12

(B) 11

(C) $\sqrt{194}$

(D) 8

Q22. Two parallel lines are cut by a transversal. If one of the co-interior (same-side interior) angles is 65° , the other co-interior angle is



- (A) 65°
- (B) 125°
- (C) 90°
- (D) 115°

Q23. The surface area of a sphere is 616 cm^2 (take $\pi = \frac{22}{7}$). Its radius (in cm) is

- (A) 14
- (B) 7
- (C) 10.5
- (D) 3.5

Q24. A rectangular field is 40 m long and 30 m wide. A path of uniform width 2 m runs all around it on the outside. The area of the path (in m^2) is

- (A) 280
- (B) 320
- (C) 296
- (D) 304

Q25. The value of $\log_2 64 + \log_3 27 - \log_5 25$ is

- (A) 7
- (B) 9
- (C) 6
- (D) 11

Q26. In a group of 50 people, 35 like tea and 25 like coffee. If every person likes at least one of the two drinks, the number of people who like both tea and coffee is

- (A) 5



- (B) 10
- (C) 15
- (D) 20

Q27. Directions (Q27–Q29): The table shows the number of units (in thousands) of a product manufactured by four factories in two years.

Factory	2022	2023
P	30	36
Q	25	20
R	40	50
S	15	24

The total number of units (in thousands) manufactured by all four factories in 2023 is

- (A) 120
- (B) 140
- (C) 110
- (D) 130

Q28. (Refer to the table in Q27.) The factory that recorded the highest percentage increase in output from 2022 to 2023 is

- (A) S
- (B) P
- (C) R
- (D) Q

Q29. (Refer to the table in Q27.) The ratio of the total output of factory R over the two years to that of factory Q over the two years is

- (A) 3 : 2



- (B) 5 : 3
- (C) 2 : 1
- (D) 9 : 5

Q30. Data Sufficiency: What is the two-digit positive integer N ?

Statement I: The sum of the digits of N is 9.

Statement II: N is a multiple of 9 and lies between 40 and 50.

Choose the correct option:

- (A) Statement I alone is sufficient, but Statement II alone is not.
- (B) Statement II alone is sufficient, but Statement I alone is not.
- (C) Each statement alone is sufficient.
- (D) Both statements together are sufficient, but neither alone is sufficient.



Part II (Q31–Q60)

- Q31.** The remainder when 2^{32} is divided by 7 is
- (A) 1
 - (B) 2
 - (C) 5
 - (D) 4
- Q32.** The smallest number which when increased by 5 is exactly divisible by 12, 18 and 30 is
- (A) 175
 - (B) 185
 - (C) 165
 - (D) 355
- Q33.** If A's income is 25% more than B's income, then B's income is less than A's income by
- (A) 25%
 - (B) 15%
 - (C) 20%
 - (D) 30%
- Q34.** The price of an article is reduced by 20%. To restore it to the original price, the reduced price must be increased by
- (A) 20%
 - (B) 25%
 - (C) 22%
 - (D) 30%
- Q35.** If $a : b = 2 : 3$ and $b : c = 4 : 5$, then $a : b : c$ equals



- (A) 8 : 12 : 15
- (B) 2 : 3 : 5
- (C) 8 : 12 : 20
- (D) 6 : 9 : 10

Q36. In what ratio must rice costing Rs. 30 per kg be mixed with rice costing Rs. 45 per kg so that the mixture is worth Rs. 40 per kg?

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

Q37. A man sells two articles at Rs. 600 each. On one he gains 20% and on the other he loses 20%. His overall result is

- (A) No profit, no loss
- (B) A loss of 4%
- (C) A gain of 4%
- (D) A loss of 2%

Q38. The cost price of 20 articles equals the selling price of 16 articles. The profit percentage is

- (A) 20%
- (B) 16%
- (C) 25%
- (D) 30%

Q39. A sum of Rs. 8000 is invested at 5% per annum compound interest, compounded annually. The amount (in Rupees) after 2 years is

- (A) 8820



- (B) 8800
- (C) 8400
- (D) 8410

Q40. A car travels the first half of a journey at 40 km/h and the second half at 60 km/h. The average speed for the whole journey (in km/h) is

- (A) 50
- (B) 52
- (C) 45
- (D) 48

Q41. A man walking at 5 km/h reaches his office 6 minutes late, but walking at 6 km/h he reaches 4 minutes early. The distance to his office (in km) is

- (A) 4
- (B) 5
- (C) 6
- (D) 4.5

Q42. 12 men can complete a job in 9 days. After they work for 3 days, 6 more men join them. The total number of days taken to complete the whole job is

- (A) 8
- (B) 6
- (C) 7
- (D) 9

Q43. A pipe can fill a tank in 6 hours and a drain pipe can empty it in 8 hours. If both are opened together when the tank is empty, the time (in hours) taken to fill the tank is



- (A) 24
- (B) 14
- (C) 48
- (D) 12

Q44. The present age of a father is three times that of his son. After 12 years, the father's age will be twice that of his son. The present age of the son (in years) is

- (A) 10
- (B) 14
- (C) 16
- (D) 12

Q45. For what value of k does the quadratic equation $x^2 - 8x + k = 0$ have equal roots?

- (A) 8
- (B) 16
- (C) 4
- (D) 32

Q46. The number of positive integers x that satisfy $5 \leq 2x + 1 \leq 15$ is

- (A) 4
- (B) 7
- (C) 5
- (D) 6

Q47. The sum of the infinite geometric series $1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \dots$ is

- (A) $\frac{3}{2}$



(B) $\frac{4}{3}$

(C) 2

(D) $\frac{2}{3}$

Q48. The number of ways in which 5 persons can be seated around a circular table is

(A) 120

(B) 60

(C) 48

(D) 24

Q49. From a group of 6 boys and 4 girls, a team of 4 is to be chosen so that it contains at least 3 girls. The number of ways is

(A) 24

(B) 25

(C) 40

(D) 30

Q50. A die is rolled once. The probability of getting a number that is either a multiple of 2 or a multiple of 3 is

(A) $\frac{1}{2}$

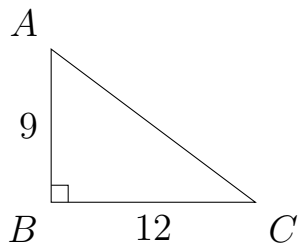
(B) $\frac{1}{3}$

(C) $\frac{2}{3}$

(D) $\frac{5}{6}$

Q51. In the right-angled triangle ABC shown, $\angle B = 90^\circ$, $AB = 9$ cm and $BC = 12$ cm. The length of the hypotenuse AC (in cm) is





- (A) 13
- (B) 21
- (C) 14
- (D) 15

Q52. The interior angle of a regular polygon is 144° . The number of sides of the polygon is

- (A) 10
- (B) 8
- (C) 12
- (D) 9

Q53. The area of an equilateral triangle of side 6 cm (in cm^2) is

- (A) $18\sqrt{3}$
- (B) $9\sqrt{3}$
- (C) $36\sqrt{3}$
- (D) $6\sqrt{3}$

Q54. The total surface area of a cube is 150 cm^2 . The volume of the cube (in cm^3) is

- (A) 64
- (B) 216
- (C) 125
- (D) 100



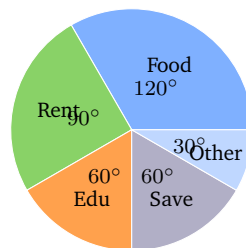
Q55. The value of $\frac{1}{\sqrt{5} + \sqrt{3}}$ after rationalising the denominator is

- (A) $\sqrt{5} - \sqrt{3}$
- (B) $\frac{\sqrt{5} + \sqrt{3}}{2}$
- (C) $\frac{\sqrt{5} + \sqrt{3}}{8}$
- (D) $\frac{\sqrt{5} - \sqrt{3}}{2}$

Q56. If $f(x) = 3x - 2$ and $g(x) = x^2$, then $f(g(2))$ equals

- (A) 10
- (B) 16
- (C) 4
- (D) 12

Q57. Directions (Q57–Q59): The pie chart shows how a family's monthly budget of Rs. 36,000 is distributed across five heads (figures are degrees of the circle).



The amount (in Rupees) allotted to Food is

- (A) 10,000
- (B) 12,000
- (C) 9000
- (D) 14,000

Q58. (Refer to the pie chart in Q57.) The amount allotted to Rent exceeds the amount allotted to Savings by (in Rupees)



- (A) 2000
- (B) 4000
- (C) 3000
- (D) 1500

Q59. (Refer to the pie chart in Q57.) The central angle for “Others” together with the amount it represents is

- (A) 30° and Rs. 3000
- (B) 30° and Rs. 3600
- (C) 60° and Rs. 3000
- (D) 30° and Rs. 6000

Q60. Data Sufficiency: Is x greater than y ?

Statement I: $x + y = 10$.

Statement II: $x - y = 4$.

Choose the correct option:

- (A) Statement I alone is sufficient, but Statement II alone is not.
- (B) Each statement alone is sufficient.
- (C) Both statements together are sufficient, but neither alone is sufficient.
- (D) Statement II alone is sufficient, but Statement I alone is not.



Detailed Solutions

Q1.

Solution

Concept — Cyclicity of unit digits: The unit digit of powers of 7 repeats in a cycle of 4: 7, 9, 3, 1.

Step 1 — Identify the cycle: $7^1 \rightarrow 7, 7^2 \rightarrow 9, 7^3 \rightarrow 3, 7^4 \rightarrow 1$, then it repeats.

Step 2 — Reduce the exponent modulo 4: $95 = 4 \times 23 + 3$, so the remainder is 3.

Step 3 — Read off the unit digit: The 3rd term of the cycle is 3.

Why other options are wrong:

- 7 corresponds to remainder 1, 9 to remainder 2, 1 to remainder 0.

Final Answer: unit digit = 3 \Rightarrow

Answer: (B) [Go Back to Q1](#)

Q2.

Solution

Concept — Product of two numbers: For any two numbers, $\text{HCF} \times \text{LCM} =$ product of the numbers.

Step 1 — Apply the relation: $13 \times 455 = 65 \times (\text{other number})$.

Step 2 — Compute the left side: $13 \times 455 = 5915$.

Step 3 — Solve for the other number: $\frac{5915}{65} = 91$.

Why other options are wrong:

- 78, 104 and 52 do not satisfy $\text{HCF} \times \text{LCM} =$ product.

Final Answer: other number = 91 \Rightarrow

Answer: (C) [Go Back to Q2](#)



Q3.

Solution

Concept — Reversing successive percentage growth: Divide the present value by each growth factor.

Step 1 — Write the growth chain: $\text{Past} \times 1.10 \times 1.20 = 1,32,000$.

Step 2 — Combine the factors: $1.10 \times 1.20 = 1.32$.

Step 3 — Solve for the past population: $\frac{1,32,000}{1.32} = 1,00,000$.

Why other options are wrong:

- 1,10,000 and 1,20,000 undo only one year's growth.
- 96,000 uses subtraction instead of division.

Final Answer: past population = 1,00,000 \Rightarrow

[Go Back to Q3](#)

Q4.

Solution

Concept — Failures by inclusion–exclusion: Those failing in at least one subject = failed Maths + failed English – failed both.

Step 1 — Failed in at least one: $40\% + 30\% - 15\% = 55\%$.

Step 2 — Passed in both: $100\% - 55\% = 45\%$.

Why other options are wrong:

- 55% is the percentage that failed at least one, not passed both.
- 30% and 40% ignore the overlap correction.

Final Answer: passed in both = 45% \Rightarrow

[Go Back to Q4](#)



Q5.

Solution

Concept — Profit sharing in ratio of investment: With equal time, profit splits in the ratio of capitals.

Step 1 — Total ratio units: $5 + 7 + 8 = 20$.

Step 2 — Value of one unit: $\frac{40,000}{20} = 2000$.

Step 3 — R's share: $8 \times 2000 = 16,000$.

Why other options are wrong:

- 14,000 is 7 units (Q's share); 10,000 is 5 units (P's share).
- 20,000 is half the profit, not 8 units.

Final Answer: R's share = Rs. 16,000 \Rightarrow **B**

Answer: (B) [Go Back to Q5](#)

Q6.

Solution

Concept — New member changing an average: Teacher's age = new total – old total.

Step 1 — Old total age: $30 \times 14 = 420$ years.

Step 2 — New total age (with teacher, 31 people): $31 \times 15 = 465$ years.

Step 3 — Teacher's age: $465 - 420 = 45$ years.

Why other options are wrong:

- 30 and 40 use the wrong head-count or average.
- 44 multiplies 30 rather than 31 by the new average.

Final Answer: teacher's age = 45 years \Rightarrow **C**

Answer: (C) [Go Back to Q6](#)



Q7.

Solution

Concept — Recover cost price, then mark up: A 10% loss means selling price is 90% of cost.

Step 1 — Find the cost price: $0.90 \times \text{CP} = 720 \Rightarrow \text{CP} = \frac{720}{0.9} = 800$.

Step 2 — Selling price for 20% gain: $800 \times 1.20 = 960$.

Why other options are wrong:

- 900 adds 20% to the loss-price 720, not to the cost.
- 880 and 1000 use incorrect cost prices.

Final Answer: required selling price = Rs. 960 \Rightarrow

Answer: (A) [Go Back to Q7](#)

Q8.

Solution

Concept — Mark-up then discount: Take cost = 100, apply the mark-up, then the discount.

Step 1 — Marked price: $100 + 40\% \text{ of } 100 = 140$.

Step 2 — Selling price after 25% discount: $140 \times 0.75 = 105$.

Step 3 — Profit percentage: Profit = $105 - 100 = 5$ on a cost of 100, so $\frac{5}{100} \times 100 = 5\%$.

Why other options are wrong:

- 15% and 12% subtract the discount from the mark-up directly.
- 10% mis-multiplies the discount factor.

Final Answer: profit = 5% \Rightarrow

Answer: (C) [Go Back to Q8](#)



Q9.

Solution

Concept — Doubling under simple interest: The money doubles when the interest earned equals the principal.

Step 1 — Interest needed: To double, $SI = P$ (a 100% return).

Step 2 — Apply the SI formula: $P = \frac{P \times r \times 8}{100}$.

Step 3 — Solve for r : $100 = 8r \Rightarrow r = 12.5\%$.

Why other options are wrong:

- 10% doubles in 10 years, not 8.
- 8% and 15% give the wrong number of years.

Final Answer: rate = 12.5% \Rightarrow **B**

Answer: (B) [Go Back to Q9](#)

Q10.

Solution

Concept — Trains crossing in opposite directions: Relative speed is the sum of the speeds; total distance is the sum of the lengths.

Step 1 — Relative speed: $54 + 36 = 90$ km/h $= 90 \times \frac{5}{18} = 25$ m/s.

Step 2 — Total length to cover: $120 + 180 = 300$ m.

Step 3 — Time: $\frac{300}{25} = 12$ seconds.

Why other options are wrong:

- 15 and 18 misconvert the relative speed.
- 10 uses only one train's length.

Final Answer: time = 12 s \Rightarrow **A**

Answer: (A) [Go Back to Q10](#)



Q11.

Solution

Concept — Boats and streams: Downstream speed = $b + s$, upstream speed = $b - s$; the stream speed is half their difference.

Step 1 — Downstream speed: $\frac{24}{3} = 8 \text{ km/h} = b + s$.

Step 2 — Upstream speed: $\frac{24}{4} = 6 \text{ km/h} = b - s$.

Step 3 — Stream speed: $s = \frac{8 - 6}{2} = 1 \text{ km/h}$.

Why other options are wrong:

- 2 is the full difference, not half of it.
- 0.5 and 1.5 come from wrong arithmetic.

Final Answer: stream speed = 1 km/h \Rightarrow C

Answer: (C) [Go Back to Q11](#)

Q12.

Solution

Concept — Pairwise work rates: Add all three pair-rates to get twice the combined rate of A, B and C.

Step 1 — Pair rates per day: $A+B = \frac{1}{12}$, $B+C = \frac{1}{15}$, $C+A = \frac{1}{20}$.

Step 2 — Add them: $\frac{1}{12} + \frac{1}{15} + \frac{1}{20} = \frac{5+4+3}{60} = \frac{12}{60} = \frac{1}{5}$. This equals $2(A + B + C)$.

Step 3 — Combined rate: $A + B + C = \frac{1}{10}$ per day.

Step 4 — A's rate: $A = (A + B + C) - (B + C) = \frac{1}{10} - \frac{1}{15} = \frac{3-2}{30} = \frac{1}{30}$, so A alone takes 30 days.

Why other options are wrong:

- 24 and 20 subtract the wrong pair rate.
- 40 forgets to halve the sum of pair rates.

Final Answer: A alone = 30 days \Rightarrow B

Answer: (B) [Go Back to Q12](#)



Q13.

Solution

Concept — Two filling pipes together: Add their per-minute rates and invert.

Step 1 — Individual rates: A fills $\frac{1}{20}$, B fills $\frac{1}{30}$ per minute.

Step 2 — Combined rate: $\frac{1}{20} + \frac{1}{30} = \frac{3+2}{60} = \frac{5}{60} = \frac{1}{12}$ per minute.

Step 3 — Time to fill: $\frac{1}{1/12} = 12$ minutes.

Why other options are wrong:

- 10 and 15 mis-add the fractions.
- 25 adds the two times instead of the rates.

Final Answer: time = 12 minutes \Rightarrow **A**

Answer: (A) [Go Back to Q13](#)

Q14.

Solution

Concept — Two linear equations: Let pen = p , pencil = q and eliminate one variable.

Step 1 — Set up: $3p + 4q = 50$ and $5p + 2q = 60$.

Step 2 — Make q -coefficients equal: Multiply the second equation by 2: $10p + 4q = 120$.

Step 3 — Subtract the first: $(10p + 4q) - (3p + 4q) = 120 - 50 \Rightarrow 7p = 70$.

Step 4 — Solve: $p = 10$.

Why other options are wrong:

- 6 is the pencil price, not the pen price.
- 12 and 8 do not satisfy both equations.

Final Answer: one pen = Rs. 10 \Rightarrow **D**

Answer: (D) [Go Back to Q14](#)



Q15.

Solution

Concept — Sum and product of roots: For $ax^2 + bx + c = 0$, $\alpha + \beta = -\frac{b}{a}$ and $\alpha\beta = \frac{c}{a}$.

Step 1 — Read off sum and product: $\alpha + \beta = \frac{5}{2}$, $\alpha\beta = \frac{3}{2}$.

Step 2 — Combine the reciprocals: $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta}$.

Step 3 — Substitute: $\frac{5/2}{3/2} = \frac{5}{3}$.

Why other options are wrong:

- $\frac{5}{2}$ forgets to divide by the product.
- $\frac{2}{3}$ and $\frac{3}{5}$ invert the ratio.

Final Answer: $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{5}{3} \Rightarrow \boxed{\text{C}}$

Answer: (C) [Go Back to Q15](#)

Q16.

Solution

Concept — Solving a linear inequality: Collect the variable on one side, constants on the other.

Step 1 — Move variable terms: $3x - 5x < 3 + 7 \Rightarrow -2x < 10$.

Step 2 — Divide by -2 (flip the sign): $x > -5$.

Why other options are wrong:

- $x < -5$ forgets to reverse the inequality when dividing by a negative.
- $x > 5$ and $x < 5$ drop the negative sign on 5.

Final Answer: $x > -5 \Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q16](#)



Q17.

Solution

Concept — Sum of an AP: $S_n = \frac{n}{2} [2a + (n - 1)d]$.

Step 1 — Identify parameters: $a = 3, d = 4, n = 20$.

Step 2 — Substitute: $S_{20} = \frac{20}{2} [2(3) + 19(4)]$.

Step 3 — Simplify inside the bracket: $6 + 76 = 82$.

Step 4 — Multiply: $10 \times 82 = 820$.

Why other options are wrong:

- 760 uses $d = 3$; 880 uses $n = 21$ terms.

Final Answer: $S_{20} = 820 \Rightarrow \boxed{D}$

Answer: (D) [Go Back to Q17](#)

Q18.

Solution

Concept — Permutations with a repeated letter: For n letters with one letter repeated k times, arrangements = $\frac{n!}{k!}$.

Step 1 — Count the letters: “LEADER” has 6 letters with E appearing twice.

Step 2 — Apply the formula: $\frac{6!}{2!} = \frac{720}{2}$.

Step 3 — Compute: = 360.

Why other options are wrong:

- 720 ignores the repeated E.
- 120 and 480 use a wrong factorial or divisor.

Final Answer: arrangements = 360 $\Rightarrow \boxed{A}$

Answer: (A) [Go Back to Q18](#)



Q19.

Solution

Concept — Selection in two independent groups: Multiply the ways of choosing men by the ways of choosing women.

Step 1 — Choose 3 men from 5: $\binom{5}{3} = 10$.

Step 2 — Choose 2 women from 4: $\binom{4}{2} = 6$.

Step 3 — Multiply: $10 \times 6 = 60$.

Why other options are wrong:

- 40 and 90 use wrong combination values.
- 120 double-counts orderings.

Final Answer: ways = 60 \Rightarrow C

Answer: (C) [Go Back to Q19](#)

Q20.

Solution

Concept — Probability without replacement: Favourable = ways to pick 2 green; total = ways to pick any 2.

Step 1 — Total ways to choose 2 from 10: $\binom{10}{2} = 45$.

Step 2 — Ways to choose 2 green from 6: $\binom{6}{2} = 15$.

Step 3 — Probability: $\frac{15}{45} = \frac{1}{3}$.

Why other options are wrong:

- $\frac{2}{15}$ is the chance of both being red.
- $\frac{3}{5}$ and $\frac{2}{5}$ use single-draw probabilities.

Final Answer: probability = $\frac{1}{3} \Rightarrow$ B

Answer: (B) [Go Back to Q20](#)



Q21.

Solution

Concept — Tangent perpendicular to radius: The radius to the point of contact is perpendicular to the tangent, giving a right triangle OTP .

Step 1 — Identify the right triangle: $\angle OTP = 90^\circ$, with OP the hypotenuse.

Step 2 — Apply Pythagoras: $PT^2 = OP^2 - OT^2 = 13^2 - 5^2$.

Step 3 — Compute: $169 - 25 = 144$, so $PT = \sqrt{144} = 12$.

Why other options are wrong:

- $\sqrt{194}$ adds the squares instead of subtracting.
- 11 and 8 come from arithmetic slips.

Final Answer: $PT = 12 \text{ cm} \Rightarrow \boxed{\text{A}}$

Answer: (A) [Go Back to Q21](#)

Q22.

Solution

Concept — Co-interior angles: The two same-side interior angles formed by a transversal cutting parallel lines are supplementary.

Step 1 — Use the supplementary property: The two angles add to 180° .

Step 2 — Solve: Other angle = $180^\circ - 65^\circ = 115^\circ$.

Why other options are wrong:

- 65° would make them equal (that is for alternate angles).
- 125° and 90° misuse the relation.

Final Answer: other angle = $115^\circ \Rightarrow \boxed{\text{D}}$

Answer: (D) [Go Back to Q22](#)



Q23.

Solution

Concept — Surface area of a sphere: $S = 4\pi r^2$.

Step 1 — Set up the equation: $4 \times \frac{22}{7} \times r^2 = 616$.

Step 2 — Isolate r^2 : $r^2 = \frac{616 \times 7}{4 \times 22} = \frac{4312}{88} = 49$.

Step 3 — Take the square root: $r = 7$ cm.

Why other options are wrong:

- 14 doubles the radius; 3.5 halves it.
- 10.5 does not satisfy $4\pi r^2 = 616$.

Final Answer: radius = 7 cm \Rightarrow **B**

Answer: (B) [Go Back to Q23](#)

Q24.

Solution

Concept — Area of an outer path: Path area = (outer rectangle area) – (field area).

Step 1 — Outer dimensions: Each side gains $2 \times 2 = 4$ m, so outer rectangle is 44×34 .

Step 2 — Outer area: $44 \times 34 = 1496$ m².

Step 3 — Field area: $40 \times 30 = 1200$ m².

Step 4 — Path area: $1496 - 1200 = 296$ m².

Why other options are wrong:

- 280 adds only 2 m to each dimension once.
- 320 and 304 use wrong outer dimensions.

Final Answer: path area = 296 m² \Rightarrow **C**

Answer: (C) [Go Back to Q24](#)



Q25.

Solution

Concept — Evaluating logarithms: $\log_b a = c$ means $b^c = a$.

Step 1 — First log: $\log_2 64 = 6$ since $2^6 = 64$.

Step 2 — Second log: $\log_3 27 = 3$ since $3^3 = 27$.

Step 3 — Third log: $\log_5 25 = 2$ since $5^2 = 25$.

Step 4 — Combine: $6 + 3 - 2 = 7$.

Why other options are wrong:

- 9 adds the third log instead of subtracting it.
- 6 and 11 mis-evaluate one of the logs.

Final Answer: value = 7 \Rightarrow **A**

Answer: (A) [Go Back to Q25](#)

Q26.

Solution

Concept — Two-set union covering everyone: If every person is in at least one set, $|A \cup B| = \text{total}$.

Step 1 — Inclusion–exclusion: $|A \cup B| = |A| + |B| - |A \cap B|$.

Step 2 — Substitute: $50 = 35 + 25 - |A \cap B|$.

Step 3 — Solve: $|A \cap B| = 60 - 50 = 10$.

Why other options are wrong:

- 5 and 15 mis-apply the formula.
- 20 ignores that everyone likes at least one drink.

Final Answer: both = 10 people \Rightarrow **B**

Answer: (B) [Go Back to Q26](#)



Q27.

Solution

Concept — Reading column totals from a table: Add the four 2023 entries.

Step 1 — List the 2023 values: $P = 36$, $Q = 20$, $R = 50$, $S = 24$.

Step 2 — Add them: $36 + 20 + 50 + 24 = 130$ (thousands).

Why other options are wrong:

- 110 is the 2022 total ($30 + 25 + 40 + 15$).
- 120 and 140 miscount one entry.

Final Answer: 2023 total = 130 thousand \Rightarrow

[Go Back to Q27](#)

Q28.

Solution

Concept — Percentage increase across a row: Compute $\frac{\text{rise}}{\text{2022 value}}$ for each factory.

Step 1 — Compute each percentage: $P: \frac{6}{30} = 20\%$; $Q: \frac{-5}{25} = -20\%$; $R: \frac{10}{40} = 25\%$; $S: \frac{9}{15} = 60\%$.

Step 2 — Pick the largest: The greatest increase is 60%, for factory S.

Why other options are wrong:

- P (20%) and R (25%) are smaller increases.
- Q's output actually fell.

Final Answer: factory S \Rightarrow

[Go Back to Q28](#)



Q29.

Solution

Concept — Two-year totals and their ratio: Add each factory's two years, then simplify the ratio.

Step 1 — R's two-year total: $40 + 50 = 90$.

Step 2 — Q's two-year total: $25 + 20 = 45$.

Step 3 — Form and reduce the ratio: $90 : 45 = 2 : 1$.

Why other options are wrong:

- $3 : 2$, $5 : 3$ and $9 : 5$ use wrong totals.

Final Answer: ratio = $2 : 1 \Rightarrow$

Answer: (C) [Go Back to Q29](#)

Q30.

Solution

Concept — Data sufficiency, unique determination: A statement is sufficient only if it pins N to exactly one value.

Step 1 — Test Statement I: Many two-digit numbers have digit-sum 9 (18, 27, 36, 45, ...), so I alone is not sufficient.

Step 2 — Test Statement II: Multiples of 9 between 40 and 50: only 45. So II alone fixes $N = 45$ and is sufficient.

Step 3 — Conclude: Statement II alone is sufficient, but Statement I alone is not.

Why other options are wrong:

- I alone leaves many candidates.
- "Each alone" and "both together needed" contradict that II alone already works.

Final Answer: II alone sufficient \Rightarrow

Answer: (B) [Go Back to Q30](#)



Q31.

Solution

Concept — Cyclic remainders of powers: The remainders of $2^n \pmod{7}$ cycle as 2, 4, 1 with period 3.

Step 1 — Establish the cycle: $2^1 \equiv 2, 2^2 \equiv 4, 2^3 \equiv 1 \pmod{7}$, then it repeats.

Step 2 — Reduce the exponent modulo 3: $32 = 3 \times 10 + 2$, so remainder of exponent is 2.

Step 3 — Read the cycle: The 2nd term is 4, so $2^{32} \equiv 4 \pmod{7}$.

Why other options are wrong:

- 1 corresponds to exponent-remainder 0; 2 to remainder 1.
- 5 is not in the cycle at all.

Final Answer: remainder = 4 \Rightarrow

[Go Back to Q31](#)

Q32.

Solution

Concept — “Exactly divisible after adding” uses the LCM: The number +5 must be a multiple of the LCM of 12, 18, 30.

Step 1 — Find the LCM: $12 = 2^2 \cdot 3, 18 = 2 \cdot 3^2, 30 = 2 \cdot 3 \cdot 5; \text{LCM} = 2^2 \cdot 3^2 \cdot 5 = 180$.

Step 2 — Smallest such number +5: The smallest positive multiple is 180 itself.

Step 3 — Subtract 5: Required number = $180 - 5 = 175$.

Why other options are wrong:

- 185 is $180 + 5$, the wrong direction.
- 165 and 355 are not 5 less than a multiple of 180.

Final Answer: number = 175 \Rightarrow

[Go Back to Q32](#)



Q33.

Solution

Concept — “More than” vs “less than” percentages use different bases: If A is $r\%$ more than B, then B is less than A by $\frac{r}{100 + r} \times 100\%$.

Step 1 — Take B = 100: Then A = 125.

Step 2 — B less than A: Difference = $125 - 100 = 25$, measured on A's base 125.

Step 3 — Convert to percent: $\frac{25}{125} \times 100 = 20\%$.

Why other options are wrong:

- 25% wrongly keeps B's base instead of A's.
- 15% and 30% come from incorrect bases.

Final Answer: B is 20% less than A \Rightarrow **C**

Answer: (C) [Go Back to Q33](#)

Q34.

Solution

Concept — Restoring after a percentage cut: A fall of 20% leaves 80%; restoring needs dividing back.

Step 1 — Take original = 100: After a 20% cut the price is 80.

Step 2 — Increase needed: To return to 100, the rise is $100 - 80 = 20$ on the base 80.

Step 3 — Convert to percent: $\frac{20}{80} \times 100 = 25\%$.

Why other options are wrong:

- 20% uses the original price as the base instead of the reduced one.
- 22% and 30% are arithmetic errors.

Final Answer: required increase = 25% \Rightarrow **B**

Answer: (B) [Go Back to Q34](#)



Q35.

Solution

Concept — Chaining two ratios: Make the common term b equal in both ratios.

Step 1 — Write the ratios: $a : b = 2 : 3$ and $b : c = 4 : 5$.

Step 2 — Equalise b (LCM of 3 and 4 is 12): $a : b = 8 : 12$ and $b : c = 12 : 15$.

Step 3 — Combine: $a : b : c = 8 : 12 : 15$.

Why other options are wrong:

- $8 : 12 : 20$ scales c incorrectly.
- $2 : 3 : 5$ and $6 : 9 : 10$ do not match both given ratios.

Final Answer: $a : b : c = 8 : 12 : 15 \Rightarrow \boxed{A}$

Answer: (A) [Go Back to Q35](#)

Q36.

Solution

Concept — Alligation rule: $\text{Ratio} = \frac{\text{dearer} - \text{mean}}{\text{mean} - \text{cheaper}}$.

Step 1 — Identify the prices: cheaper = 30, dearer = 45, mean = 40.

Step 2 — Apply alligation: Ratio of cheaper to dearer = $(45 - 40) : (40 - 30) = 5 : 10$.

Step 3 — Simplify: $5 : 10 = 1 : 2$.

Why other options are wrong:

- $2 : 1$ reverses the cheaper-to-dearer order.
- $3 : 2$ uses wrong differences.

Final Answer: ratio = $1 : 2 \Rightarrow \boxed{D}$

Answer: (D) [Go Back to Q36](#)



Q37.

Solution

Concept — Equal selling prices, equal \pm percentages: Selling two items at the same price with equal gain and loss percent always yields a net loss of $\left(\frac{x}{10}\right)^2\%$.

Step 1 — Apply the shortcut: Here $x = 20$, so loss = $\left(\frac{20}{10}\right)^2 = 4\%$.

Step 2 — Verify with cost prices: $CP_1 = \frac{600}{1.2} = 500$, $CP_2 = \frac{600}{0.8} = 750$; total CP = 1250, total SP = 1200, loss = 50 on 1250 = 4%.

Why other options are wrong:

- “No profit, no loss” ignores the unequal cost prices.
- A gain of 4% has the wrong sign; 2% is the wrong magnitude.

Final Answer: a loss of 4% \Rightarrow **B**

Answer: (B) [Go Back to Q37](#)

Q38.

Solution

Concept — CP of many = SP of fewer: Profit% = $\frac{\text{CP count} - \text{SP count}}{\text{SP count}} \times 100$.

Step 1 — Let each article cost CP = 1: CP of 20 articles = 20.

Step 2 — This equals SP of 16: So SP of 16 articles = 20, giving SP per article = $\frac{20}{16} = 1.25$.

Step 3 — Profit percentage: $\frac{1.25 - 1}{1} \times 100 = 25\%$.

Why other options are wrong:

- 20% takes the difference over the larger count.
- 16% and 30% misplace the base.

Final Answer: profit = 25% \Rightarrow **C**

Answer: (C) [Go Back to Q38](#)



Q39.

Solution

Concept — Compound amount formula: $A = P \left(1 + \frac{r}{100}\right)^n$.

Step 1 — Substitute: $A = 8000 \left(1 + \frac{5}{100}\right)^2 = 8000(1.05)^2$.

Step 2 — Square the factor: $(1.05)^2 = 1.1025$.

Step 3 — Multiply: $8000 \times 1.1025 = 8820$.

Why other options are wrong:

- 8800 uses simple interest ($8000 + 2 \times 400$).
- 8400 and 8410 apply only one year or a wrong factor.

Final Answer: amount = Rs. 8820 \Rightarrow **A**

Answer: (A) [Go Back to Q39](#)

Q40.

Solution

Concept — Equal distances, harmonic mean of speeds: Average speed = $\frac{2v_1v_2}{v_1 + v_2}$.

Step 1 — Substitute: $v_1 = 40, v_2 = 60$.

Step 2 — Numerator and denominator: $2 \times 40 \times 60 = 4800; 40 + 60 = 100$.

Step 3 — Divide: $\frac{4800}{100} = 48$ km/h.

Why other options are wrong:

- 50 is the plain average of 40 and 60, valid only for equal times.
- 52 and 45 are not the harmonic mean.

Final Answer: average speed = 48 km/h \Rightarrow **D**

Answer: (D) [Go Back to Q40](#)



Q41.

Solution

Concept — Same distance, two speeds, time gap: The time difference between the two speeds equals the total early-plus-late gap.

Step 1 — Convert the time gap to hours: 6 min late + 4 min early = 10 min = $\frac{1}{6}$ hour.

Step 2 — Set up with distance d : $\frac{d}{5} - \frac{d}{6} = \frac{1}{6}$.

Step 3 — Combine the fractions: $\frac{6d - 5d}{30} = \frac{d}{30} = \frac{1}{6}$.

Step 4 — Solve: $d = \frac{30}{6} = 5$ km.

Why other options are wrong:

- 4 and 6 mis-convert the time gap.
- 4.5 uses a wrong fraction subtraction.

Final Answer: distance = 5 km \Rightarrow **B**

Answer: (B) [Go Back to Q41](#)

Q42.

Solution

Concept — Man-days with a mid-job change: Total work in man-days stays fixed; track work done before and after the reinforcement.

Step 1 — Total work: $12 \times 9 = 108$ man-days.

Step 2 — Work done in first 3 days: $12 \times 3 = 36$ man-days, leaving $108 - 36 = 72$.

Step 3 — Days for 18 men to finish the rest: $\frac{72}{18} = 4$ days.

Step 4 — Total time: $3 + 4 = 7$ days.

Why other options are wrong:

- 8 and 9 ignore the extra workers.
- 6 miscounts the remaining work.

Final Answer: total time = 7 days \Rightarrow **C**

Answer: (C) [Go Back to Q42](#)



Q43.

Solution

Concept — Fill pipe with a drain: Net rate = fill rate – drain rate.

Step 1 — Individual rates: Fill = $\frac{1}{6}$, drain = $\frac{1}{8}$ of the tank per hour.

Step 2 — Net rate: $\frac{1}{6} - \frac{1}{8} = \frac{4-3}{24} = \frac{1}{24}$ per hour.

Step 3 — Time to fill: $\frac{1}{1/24} = 24$ hours.

Why other options are wrong:

- 14 and 12 add the rates instead of subtracting.
- 48 mis-computes the net fraction.

Final Answer: time = 24 hours \Rightarrow

Answer: (A) [Go Back to Q43](#)

Q44.

Solution

Concept — Age problems with two conditions: Translate “three times” and “after 12 years” into equations.

Step 1 — Let son = s : Father = $3s$ now.

Step 2 — Condition after 12 years: $3s + 12 = 2(s + 12)$.

Step 3 — Expand and solve: $3s + 12 = 2s + 24 \Rightarrow s = 12$.

Why other options are wrong:

- 10, 14 and 16 do not satisfy both age conditions.

Final Answer: son’s age = 12 years \Rightarrow

Answer: (D) [Go Back to Q44](#)



Q45.

Solution

Concept — Equal roots need zero discriminant: For $ax^2 + bx + c = 0$, equal roots require $b^2 - 4ac = 0$.

Step 1 — Identify coefficients: $a = 1, b = -8, c = k$.

Step 2 — Set discriminant to zero: $(-8)^2 - 4(1)(k) = 0$.

Step 3 — Solve: $64 - 4k = 0 \Rightarrow k = 16$.

Why other options are wrong:

- 8 is half of b , not the discriminant condition.
- 4 and 32 mis-solve $64 = 4k$.

Final Answer: $k = 16 \Rightarrow$ **B**

Answer: (B) [Go Back to Q45](#)

Q46.

Solution

Concept — Counting integer solutions of a compound inequality: Solve for x , then count positive integers.

Step 1 — Subtract 1 throughout: $4 \leq 2x \leq 14$.

Step 2 — Divide by 2: $2 \leq x \leq 7$.

Step 3 — List positive integers: $x \in \{2, 3, 4, 5, 6, 7\}$, which is 6 values.

Why other options are wrong:

- 4 and 5 drop endpoints; 7 counts an extra value.

Final Answer: number of integers = 6 \Rightarrow **D**

Answer: (D) [Go Back to Q46](#)



Q47.

Solution

Concept — Sum of an infinite GP: For $|r| < 1$, $S_\infty = \frac{a}{1-r}$.

Step 1 — Identify a and r : $a = 1$, $r = \frac{1}{3}$.

Step 2 — Apply the formula: $S_\infty = \frac{1}{1 - \frac{1}{3}} = \frac{1}{\frac{2}{3}}$.

Step 3 — Simplify: $= \frac{3}{2}$.

Why other options are wrong:

- $\frac{4}{3}$ uses $r = \frac{1}{4}$; 2 uses $r = \frac{1}{2}$.
- $\frac{2}{3}$ inverts the formula.

Final Answer: sum $= \frac{3}{2} \Rightarrow$

Answer: (A) [Go Back to Q47](#)

Q48.

Solution

Concept — Circular permutations: The number of ways to seat n distinct people around a circle is $(n-1)!$.

Step 1 — Apply the formula: $n = 5$, so arrangements $= (5-1)! = 4!$.

Step 2 — Compute: $4! = 24$.

Why other options are wrong:

- $120 = 5!$ counts linear arrangements.
- 60 and 48 do not match $(n-1)!$.

Final Answer: arrangements $= 24 \Rightarrow$

Answer: (D) [Go Back to Q48](#)



Q49.

Solution

Concept — “At least” by cases: Split into exactly 3 girls and exactly 4 girls.

Step 1 — Case 3 girls, 1 boy: $\binom{4}{3} \binom{6}{1} = 4 \times 6 = 24$.

Step 2 — Case 4 girls, 0 boys: $\binom{4}{4} \binom{6}{0} = 1 \times 1 = 1$.

Step 3 — Add the cases: $24 + 1 = 25$.

Why other options are wrong:

- 24 forgets the all-girls case.
- 40 and 30 over-count.

Final Answer: number of ways = 25 \Rightarrow **B**

Answer: (B) [Go Back to Q49](#)

Q50.

Solution

Concept — Probability of a union on a die: $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

Step 1 — Multiples of 2: $\{2, 4, 6\}$, so $P = \frac{3}{6}$.

Step 2 — Multiples of 3: $\{3, 6\}$, so $P = \frac{2}{6}$; overlap $\{6\}$ has $P = \frac{1}{6}$.

Step 3 — Combine: $\frac{3}{6} + \frac{2}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$.

Why other options are wrong:

- $\frac{1}{2}$ and $\frac{1}{3}$ count only one of the two sets.
- $\frac{5}{6}$ forgets to subtract the overlap.

Final Answer: probability = $\frac{2}{3} \Rightarrow$ **C**

Answer: (C) [Go Back to Q50](#)



Q51.

Solution

Concept — Pythagoras in a right triangle: The hypotenuse² equals the sum of the squares of the legs.

Step 1 — Square the legs: $AB^2 = 9^2 = 81$, $BC^2 = 12^2 = 144$.

Step 2 — Add: $AC^2 = 81 + 144 = 225$.

Step 3 — Take the square root: $AC = \sqrt{225} = 15$ cm.

Why other options are wrong:

- 13 matches the 5-12-13 triple, not 9-12.
- 21 adds the legs; 14 is an arithmetic slip.

Final Answer: $AC = 15$ cm \Rightarrow

Answer: (D) [Go Back to Q51](#)

Q52.

Solution

Concept — Interior angle of a regular polygon: Each interior angle = $\frac{(n-2) \times 180^\circ}{n}$.

Step 1 — Set up the equation: $\frac{(n-2) \times 180}{n} = 144$.

Step 2 — Cross-multiply: $180n - 360 = 144n$.

Step 3 — Solve: $36n = 360 \Rightarrow n = 10$.

Why other options are wrong:

- 8 gives an interior angle of 135° ; 12 gives 150° .
- 9 gives 140° .

Final Answer: number of sides = 10 \Rightarrow

Answer: (A) [Go Back to Q52](#)



Q53.

Solution

Concept — Area of an equilateral triangle: $\text{Area} = \frac{\sqrt{3}}{4}a^2$.

Step 1 — Substitute the side: $a = 6$, so $a^2 = 36$.

Step 2 — Apply the formula: $\text{Area} = \frac{\sqrt{3}}{4} \times 36$.

Step 3 — Simplify: $= 9\sqrt{3} \text{ cm}^2$.

Why other options are wrong:

- $18\sqrt{3}$ uses $\frac{\sqrt{3}}{2}a^2$; $36\sqrt{3}$ drops the $\frac{1}{4}$.
- $6\sqrt{3}$ uses the side instead of its square.

Final Answer: $\text{area} = 9\sqrt{3} \text{ cm}^2 \Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q53](#)

Q54.

Solution

Concept — From surface area to volume of a cube: $\text{Surface area} = 6a^2$; $\text{volume} = a^3$.

Step 1 — Find the edge: $6a^2 = 150 \Rightarrow a^2 = 25 \Rightarrow a = 5 \text{ cm}$.

Step 2 — Compute the volume: $a^3 = 5^3 = 125 \text{ cm}^3$.

Why other options are wrong:

- 64 and 216 correspond to edges 4 and 6, not 5.
- 100 is not a perfect cube.

Final Answer: $\text{volume} = 125 \text{ cm}^3 \Rightarrow \boxed{\text{C}}$

Answer: (C) [Go Back to Q54](#)



Q55.

Solution

Concept — Rationalising a surd denominator: Multiply by the conjugate $\sqrt{5} - \sqrt{3}$.

Step 1 — Multiply top and bottom: $\frac{1}{\sqrt{5} + \sqrt{3}} \times \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} - \sqrt{3}}$.

Step 2 — Simplify the denominator: $(\sqrt{5})^2 - (\sqrt{3})^2 = 5 - 3 = 2$.

Step 3 — Write the result: $\frac{\sqrt{5} - \sqrt{3}}{2}$.

Why other options are wrong:

- $\sqrt{5} - \sqrt{3}$ omits the denominator 2.
- $\frac{\sqrt{5} + \sqrt{3}}{2}$ keeps the wrong sign; $\frac{\sqrt{5} + \sqrt{3}}{8}$ uses a wrong denominator.

Final Answer: $\frac{\sqrt{5} - \sqrt{3}}{2} \Rightarrow \boxed{\text{D}}$

Answer: (D) [Go Back to Q55](#)

Q56.

Solution

Concept — Composition of functions: Evaluate the inner function first, then the outer one.

Step 1 — Inner value: $g(2) = 2^2 = 4$.

Step 2 — Outer value: $f(4) = 3(4) - 2 = 12 - 2 = 10$.

Why other options are wrong:

- 16 computes $g(g(2))$ or squares incorrectly.
- 4 stops at $g(2)$; 12 forgets the -2 .

Final Answer: $f(g(2)) = 10 \Rightarrow \boxed{\text{A}}$

Answer: (A) [Go Back to Q56](#)



Q57.

Solution

Concept — Reading a pie chart: Amount = $\frac{\text{central angle}}{360^\circ} \times \text{total}$.

Step 1 — Food's central angle: 120° .

Step 2 — Apply the proportion: Food = $\frac{120}{360} \times 36,000 = \frac{1}{3} \times 36,000$.

Step 3 — Compute: = 12,000.

Why other options are wrong:

- 10,000 and 9000 use wrong fractions of the budget.
- 14,000 overstates Food's share.

Final Answer: Food = Rs. 12,000 \Rightarrow **B**

Answer: (B) [Go Back to Q57](#)

Q58.

Solution

Concept — Difference of two pie slices: Convert each angle to an amount, then subtract.

Step 1 — Rent amount: $\frac{90}{360} \times 36,000 = \frac{1}{4} \times 36,000 = 9000$.

Step 2 — Savings amount: $\frac{60}{360} \times 36,000 = \frac{1}{6} \times 36,000 = 6000$.

Step 3 — Difference: $9000 - 6000 = 3000$.

Why other options are wrong:

- 2000 and 1500 use wrong slice values.
- 4000 mis-subtracts the two amounts.

Final Answer: difference = Rs. 3000 \Rightarrow **C**

Answer: (C) [Go Back to Q58](#)



Q59.

Solution

Concept — Slice angle and its amount: The chart already lists “Others” as 30° ; convert it to money.

Step 1 — Read the angle: “Others” = 30° .

Step 2 — Convert to amount: $\frac{30}{360} \times 36,000 = \frac{1}{12} \times 36,000 = 3000$.

Step 3 — Pair them: 30° and Rs. 3000.

Why other options are wrong:

- Rs. 3600 and Rs. 6000 use wrong fractions.
- 60° misreads the slice angle.

Final Answer: 30° and Rs. 3000 \Rightarrow **A**

Answer: (A) [Go Back to Q59](#)

Q60.

Solution

Concept — Data sufficiency for a comparison: We need to decide whether $x > y$ with certainty.

Step 1 — Test Statement I: $x + y = 10$ allows e.g. (7, 3) where $x > y$ and (3, 7) where $x < y$, so I alone is not sufficient.

Step 2 — Test Statement II: $x - y = 4 > 0$ directly means $x > y$, so II alone is sufficient.

Step 3 — Conclude: Statement II alone is sufficient, but Statement I alone is not.

Why other options are wrong:

- I alone leaves the comparison undetermined.
- “Each alone” and “both together needed” contradict that II alone settles it.

Final Answer: II alone sufficient \Rightarrow **D**

Answer: (D) [Go Back to Q60](#)



Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	C	3	A	4	D	5	B
6	C	7	A	8	C	9	B	10	A
11	C	12	B	13	A	14	D	15	C
16	B	17	D	18	A	19	C	20	B
21	A	22	D	23	B	24	C	25	A
26	B	27	D	28	A	29	C	30	B
31	D	32	A	33	C	34	B	35	A
36	D	37	B	38	C	39	A	40	D
41	B	42	C	43	A	44	D	45	B
46	D	47	A	48	D	49	B	50	C
51	D	52	A	53	B	54	C	55	D
56	A	57	B	58	C	59	A	60	D

