

CAT Quantitative Aptitude

Sample Paper – 14

Duration: 40 Minutes

Maximum Marks: 66

Instructions

- This paper contains **22 MCQ questions (single-correct)**, modelled on the Quantitative Aptitude section of CAT.
- Each correct answer carries **+3 marks**. There is a penalty of **−1 mark per wrong MCQ**; **0 marks** for unattempted questions.
- Only **one** option is correct per question. Choose carefully.
- **No personal calculators** are permitted; a basic on-screen calculator is provided in the actual CAT exam.
- **Rough sheets** are provided at the test centre; use them freely for calculations.
- Syllabus level: **Arithmetic, Algebra, Geometry & Mensuration, and Modern Mathematics** at the level of the CAT Quantitative Aptitude section.

Questions (Q1 – Q22)

Q1. How many numbers from 1 to 200 are divisible by 4 but not by 12?

- (A) 50
- (B) 16
- (C) 34
- (D) 40

Q2. The product of two numbers is 1,440 and their HCF is 12. Find their LCM.

- (A) 100
- (B) 120



(C) 144

(D) 180

Q3. Rs. 8,000 is invested at 10% per annum compound interest. Find the amount at the end of 2 years.

(A) Rs. 9,600

(B) Rs. 9,440

(C) Rs. 9,520

(D) Rs. 9,680

Q4. City A's population is 40% less than City B's. By what percentage is City B's population more than City A's?

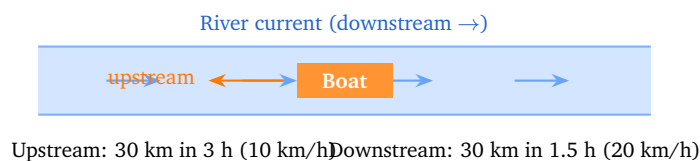
(A) $\frac{200}{3}\%$

(B) 60%

(C) 40%

(D) 50%

Q5. A boat travels 30 km upstream in 3 hours and 30 km downstream in 1.5 hours. Find the speed of the boat in still water.



(A) 12 km/h

(B) 15 km/h

(C) 18 km/h

(D) 10 km/h

Q6. A, B and C invest in a business for 6 months, 4 months and 3 months respectively, with amounts Rs. 2,000, Rs. 3,000 and Rs. 4,000. If the total profit is Rs. 2,250, find B's share.



- (A) Rs. 600
- (B) Rs. 900
- (C) Rs. 750
- (D) Rs. 1,000

Q7. A alone can finish a work in 12 days. A and B together can finish it in 8 days. In how many days can B alone finish the work?

- (A) 24 days
- (B) 20 days
- (C) 18 days
- (D) 16 days

Q8. Find the arithmetic mean of the first 10 multiples of 7.

- (A) 35
- (B) 38
- (C) 42
- (D) 38.5

Q9. A sells an article to B at 20% profit. B sells it to C at 10% loss. If C pays Rs. 2,160, how much did A originally pay for it?

- (A) Rs. 1,800
- (B) Rs. 2,000
- (C) Rs. 2,200
- (D) Rs. 2,400

Q10. Two trains of lengths 125 m and 175 m run on parallel tracks in opposite directions at 54 km/h and 36 km/h respectively. How long do they take to cross each other?



- (A) 9 s
- (B) 10 s
- (C) 12 s
- (D) 15 s

Q11. The sum of first n terms of an AP 1, 3, 5, 7, ... is 256. Find n .

- (A) 16
- (B) 14
- (C) 18
- (D) 20

Q12. The roots of the equation $x^2 - 7x + 12 = 0$ are α and β . Find $\alpha^2 + \beta^2$.

- (A) 49
- (B) 13
- (C) 37
- (D) 25

Q13. Evaluate: $\log_2 8 + \log_2 16 + \log_2 32$.

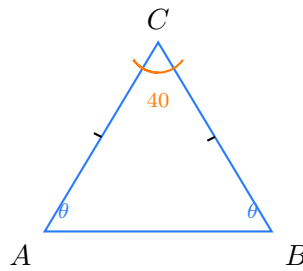
- (A) 9
- (B) 11
- (C) 12
- (D) 14

Q14. In a geometric progression, the first term is 2 and the common ratio is 3. Find the 4th term.

- (A) 27
- (B) 54
- (C) 18
- (D) 162

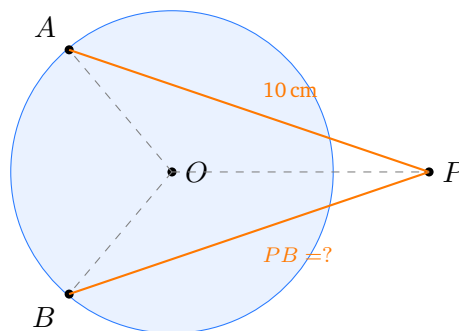


Q15. In an isosceles triangle, the vertex angle is 40. Find each base angle.



- (A) 70
- (B) 65
- (C) 75
- (D) 80

Q16. From an external point P , two tangents PA and PB are drawn to a circle. If $PA = 10$ cm, find PB .



- (A) 5 cm
- (B) 8 cm
- (C) 12 cm
- (D) 10 cm

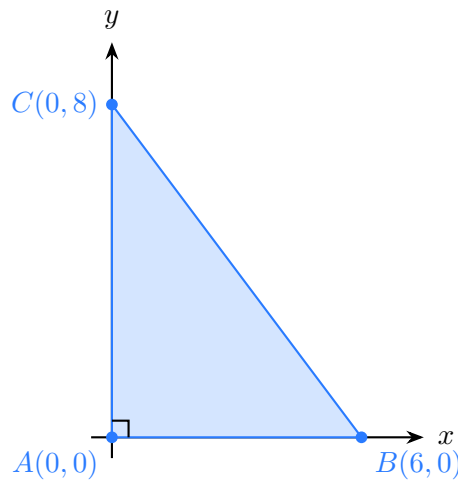
Q17. The volume of a sphere is $288\pi \text{ cm}^3$. Find its surface area.

- (A) $36\pi \text{ cm}^2$
- (B) $72\pi \text{ cm}^2$
- (C) $144\pi \text{ cm}^2$



(D) $108\pi \text{ cm}^2$

Q18. Find the area of the triangle with vertices $A(0, 0)$, $B(6, 0)$ and $C(0, 8)$.



- (A) 20 sq. units
- (B) 24 sq. units
- (C) 30 sq. units
- (D) 36 sq. units

Q19. A right circular cone has base radius 5 cm and height 12 cm. Find the slant height.

- (A) 13 cm
- (B) 15 cm
- (C) 14 cm
- (D) 17 cm

Q20. From a group of 5 boys and 4 girls, a committee of 3 boys and 2 girls is to be formed. In how many ways can this be done?

- (A) 36
- (B) 48
- (C) 80



(D) 60

Q21. Two fair dice are thrown simultaneously. Find the probability that the sum of numbers on top faces is at least 9.

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

(B) $\frac{5}{18}$

(C) $\frac{1}{4}$

(D) $\frac{7}{36}$

Q22. In a survey of 100 people, $n(A) = 52$, $n(B) = 44$, and $n(A \cap B) = 24$. Find $n(A \cup B)$.

(A) 68

(B) 70

(C) 72

(D) 76



Detailed Solutions**Q1.****Solution**

Concept – Number Theory: To count numbers divisible by 4 but not by 12, use inclusion-exclusion. A number divisible by 12 is also divisible by 4 (since $12 = 4 \times 3$), so we subtract those.

Step 1 – Count multiples of 4 from 1 to 200:

$$\left\lfloor \frac{200}{4} \right\rfloor = 50.$$

Step 2 – Count multiples of $\text{LCM}(4, 12) = 12$ from 1 to 200:

$$\left\lfloor \frac{200}{12} \right\rfloor = \lfloor 16.67 \rfloor = 16.$$

Step 3 – Subtract to get numbers divisible by 4 but NOT by 12:

$$50 - 16 = 34.$$

Why other options are wrong:

- Option A (50): This is the count of all multiples of 4, without excluding multiples of 12.
- Option B (16): This is the count of multiples of 12 only; the question asks for the complement within multiples of 4.
- Option D (40): Likely from incorrectly computing $\lfloor 200/5 \rfloor = 40$, unrelated to the problem.

Final Answer: $50 - 16 = 34 \Rightarrow \boxed{C}$

Answer: (C) [Go Back to Q 1](#)



Q2.

Solution**Concept – Number Theory:** The fundamental relationship between HCF and LCM:

$$\text{HCF} \times \text{LCM} = \text{Product of the two numbers.}$$

Step 1 – Apply the formula directly:

$$\text{LCM} = \frac{\text{Product}}{\text{HCF}} = \frac{1440}{12} = 120.$$

Why other options are wrong:

- Option A (100): $12 \times 100 = 1200 \neq 1440$.
- Option C (144): $12 \times 144 = 1728 \neq 1440$; confuses HCF with 10 and computes $1440/10$.
- Option D (180): $12 \times 180 = 2160 \neq 1440$; divides 1440 by 8 instead of 12.

Final Answer: $\text{LCM} = 120 \Rightarrow \boxed{\text{B}}$ **Answer: (B)** [Go Back to Q 2](#)

Q3.

Solution**Concept – Compound Interest:** Amount after n years at rate $r\%$ per annum:

$$A = P \left(1 + \frac{r}{100} \right)^n.$$

Step 1 – Substitute $P = 8000$, $r = 10$, $n = 2$:

$$A = 8000 \times \left(1 + \frac{10}{100} \right)^2 = 8000 \times (1.1)^2 = 8000 \times 1.21 = 9680.$$

Why other options are wrong:

- Option A (Rs. 9,600): Uses simple interest: $8000 + 8000 \times 0.10 \times 2 = 9600$; ignores compounding.
- Option B (Rs. 9,440): Arithmetic error; no standard compound calculation yields this.
- Option C (Rs. 9,520): Another arithmetic slip; $(1.1)^2 = 1.21$, not 1.19.



Final Answer: Amount = Rs. 9,680 $\Rightarrow$ D

Answer: (D) [Go Back to Q 3](#)

Q4.

Solution

Concept – Percentages: If A is $x\%$ less than B, then B is more than A by $\frac{x}{100 - x} \times 100\%$.

Step 1 – Let City B's population = 100. Then City A's population = $100 - 40 = 60$.

Step 2 – Find by what percentage B is more than A:

$$\frac{B - A}{A} \times 100 = \frac{100 - 60}{60} \times 100 = \frac{40}{60} \times 100 = \frac{200}{3}\%.$$

Why other options are wrong:

- Option B (60%): This is B's excess over A expressed as a fraction of B, not of A: $40/100 \times 100 = 40\%$ (also wrong direction).
- Option C (40%): This is the given reduction percentage (A is 40% less than B), not the reverse comparison.
- Option D (50%): Incorrect calculation; $40/80 \times 100 = 50\%$ uses a wrong base of 80.

Final Answer: B is $\frac{200}{3}\%$ more than A $\Rightarrow$ A

Answer: (A) [Go Back to Q 4](#)

Q5.

Solution

Concept – Time, Speed, Distance for boats: Let b = speed of boat in still water, c = speed of current. Then: Upstream speed = $b - c$, Downstream speed = $b + c$.

Step 1 – Find upstream and downstream speeds:

$$\text{Upstream speed} = \frac{30}{3} = 10 \text{ km/h,} \quad \text{Downstream speed} = \frac{30}{1.5} = 20 \text{ km/h.}$$



Step 2 – Find the speed of the boat in still water:

$$b = \frac{\text{Upstream} + \text{Downstream}}{2} = \frac{10 + 20}{2} = 15 \text{ km/h.}$$

Why other options are wrong:

- Option A (12 km/h): Incorrect average; perhaps uses $(10 + 14)/2$ with a wrong downstream calculation.
- Option C (18 km/h): Adds upstream and downstream but divides by a different denominator.
- Option D (10 km/h): This is only the upstream speed, not the still-water speed.

Final Answer: Speed of boat in still water = 15 km/h $\Rightarrow$ **B**

Answer: (B) [Go Back to Q 5](#)

Q6.

Solution

Concept – Partnership: Profit is shared in the ratio of (capital $\times$ time invested).

Step 1 – Compute capital-month for each partner:

$$A = 2000 \times 6 = 12,000,$$

$$B = 3000 \times 4 = 12,000,$$

$$C = 4000 \times 3 = 12,000.$$

Step 2 – All capital-months are equal, so profit is shared equally (ratio 1 : 1 : 1):

$$\text{B's share} = \frac{1}{3} \times 2250 = \text{Rs. } 750.$$

Why other options are wrong:

- Option A (Rs. 600): Uses only the capital amounts (2000:3000:4000) without multiplying by time; gives B a $3/9$ share of 2250, which is Rs. 750 — but the raw ratio alone gives $3/9 \times 2250 = 750$. If someone uses 2:3:4, B gets $3/9 \times 2250 = 750$ — same answer. Rs. 600 would arise from ratio 2:4:3 with B taking $4/9$, which is a table-entry error.
- Option B (Rs. 900): Arises from splitting 2250 in ratio 2:4:3 and assigning B = 4 parts: $4/9 \times 2250 = 1000$. Or from an incorrect ratio 1:2:1 giving



$2/4 \times 2250 = 1125$. None cleanly give 900 from the correct method.

- Option D (Rs. 1,000): Uses ratio 4:3:2 and assigns B the 3-part share, giving $3/9 \times 3000 = 1000$; incorrect time ordering.

Final Answer: B's share = Rs. 750 $\Rightarrow$ C

Answer: (C) [Go Back to Q 6](#)

Q7.

Solution

Concept – Work-rate: If a person can complete a job in n days, their rate is $1/n$ per day. Rates are additive for combined work.

Step 1 – Find the work rates of A and of A+B together:

$$\text{Rate of A} = \frac{1}{12}, \quad \text{Rate of A+B} = \frac{1}{8}.$$

Step 2 – Find B's rate alone and hence B's time:

$$\text{Rate of B} = \frac{1}{8} - \frac{1}{12} = \frac{3}{24} - \frac{2}{24} = \frac{1}{24}.$$

B alone takes = 24 days.

Why other options are wrong:

- Option B (20 days): $1/20 + 1/12 = 3/60 + 5/60 = 8/60 \neq 1/8$; incorrect.
- Option C (18 days): $1/18 + 1/12 = 2/36 + 3/36 = 5/36 \neq 1/8$; incorrect.
- Option D (16 days): $1/16 + 1/12 = 3/48 + 4/48 = 7/48 \neq 1/8$; incorrect.

Final Answer: B alone takes 24 days $\Rightarrow$ A

Answer: (A) [Go Back to Q 7](#)



Q8.

Solution

Concept – Arithmetic Mean: The first 10 multiples of 7 form an AP with first term $a = 7$, common difference $d = 7$, and $n = 10$ terms. Mean of an AP = (first term + last term) / 2.

Step 1 – Identify first and last terms:

$$\text{First} = 7, \quad \text{Last} = 7 \times 10 = 70.$$

Step 2 – Calculate the mean:

$$\text{Mean} = \frac{7 + 70}{2} = \frac{77}{2} = 38.5.$$

Verification: Sum = $7(1 + 2 + \dots + 10) = 7 \times 55 = 385$. Mean = $385/10 = 38.5$. ✓

Why other options are wrong:

- Option A (35): This is the 5th multiple of 7, i.e., the median term of the sequence, not the mean (though for this AP they coincide at 38.5, not 35).
- Option B (38): Off by 0.5; likely rounds down 38.5 incorrectly.
- Option C (42): This is the 6th multiple of 7; no standard mean calculation gives this.

Final Answer: Arithmetic mean = 38.5 $\Rightarrow$ D

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

Q9.

Solution

Concept – Profit/Loss in a chain: If A buys at price P , sells to B at 20% profit, and B sells to C at 10% loss, we work backwards from C's price.

Step 1 – Express C's price in terms of A's cost price P :

$$\text{B buys from A at: } 1.2P. \quad \text{C pays B: } 1.2P \times 0.9 = 1.08P.$$

Step 2 – Set $1.08P = 2160$ and solve:

$$P = \frac{2160}{1.08} = 2000.$$



Why other options are wrong:

- Option A (Rs. 1,800): Uses only a 20% factor: $2160/1.2 = 1800$; forgets B's 10% loss to C.
- Option C (Rs. 2,200): Applies 10% loss then 20% profit in the wrong order, or uses addition instead.
- Option D (Rs. 2,400): Applies 10% gain instead of loss for B's transaction.

Final Answer: A's original cost = Rs. 2,000 $\Rightarrow$ **B**

Answer: (B) [Go Back to Q 9](#)

Q10.

Solution

Concept – Time, Speed, Distance for trains moving in opposite directions: Relative speed is the sum of their speeds. Total distance to cross = sum of both train lengths.

Step 1 – Convert speeds to m/s and find relative speed:

$$54 \text{ km/h} = 54 \times \frac{5}{18} = 15 \text{ m/s}, \quad 36 \text{ km/h} = 36 \times \frac{5}{18} = 10 \text{ m/s}.$$

$$\text{Relative speed} = 15 + 10 = 25 \text{ m/s}.$$

Step 2 – Find total distance and crossing time:

$$\text{Total distance} = 125 + 175 = 300 \text{ m}.$$

$$\text{Time} = \frac{300}{25} = 12 \text{ seconds}.$$

Why other options are wrong:

- Option A (9 s): Uses relative speed = $90/9 = \text{wrong}$; likely takes only one train's length: $125/25 = 5 \text{ s}$, or uses only the length difference.
- Option B (10 s): Uses total distance 250 m (forgets to add 175 m) and divides by 25: $250/25 = 10$.
- Option D (15 s): Uses relative speed = $90 - 36 = 54 \text{ km/h}$ (subtracts instead of adds) = 15 m/s ; $300/15 = 20$ (still not 15). Or takes $300/20 = 15$ using a wrong speed.

Final Answer: Time to cross = 12 seconds $\Rightarrow$ **C**



Answer: (C) [Go Back to Q 10](#)

Q11.

Solution

Concept – Arithmetic Progression: The sequence 1, 3, 5, 7, ... is the sequence of odd numbers. The sum of the first n odd numbers equals n^2 .

Step 1 – Use the known result for the AP of odd numbers:

$$S_n = n^2 \quad (\text{since } a = 1, d = 2 \implies S_n = \frac{n}{2}(2 + (n-1) \cdot 2) = n^2).$$

Step 2 – Set $n^2 = 256$ and solve:

$$n = \sqrt{256} = 16.$$

Why other options are wrong:

- Option B (14): $14^2 = 196 \neq 256$.
- Option C (18): $18^2 = 324 \neq 256$.
- Option D (20): $20^2 = 400 \neq 256$.

Final Answer: $n = 16 \Rightarrow$ A

Answer: (A) [Go Back to Q 11](#)

Q12.

Solution

Concept – Quadratic Roots: By Vieta's formulas for $x^2 - 7x + 12 = 0$: sum of roots $\alpha + \beta = 7$ and product $\alpha\beta = 12$.

Step 1 – Apply the identity:

$$\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta.$$

Step 2 – Substitute values:

$$\alpha^2 + \beta^2 = 7^2 - 2 \times 12 = 49 - 24 = 25.$$

Why other options are wrong:



- Option A (49): Uses $(\alpha + \beta)^2 = 49$ without subtracting $2\alpha\beta$; ignores the cross term.
- Option B (13): Computes $\alpha\beta + 1 = 13$ or confuses $\alpha^2 + \beta^2$ with $(\alpha - \beta)^2 = 1$; the discriminant is $49 - 48 = 1$, so $\alpha - \beta = 1$, not the required sum.
- Option C (37): Uses $49 - 12 = 37$; subtracts $\alpha\beta$ once instead of $2\alpha\beta$.

Final Answer: $\alpha^2 + \beta^2 = 25 \Rightarrow$ D

Answer: (D) [Go Back to Q 12](#)

Q13.

Solution

Concept – Logarithms: $\log_b(b^k) = k$. Here base = 2, so $\log_2(2^k) = k$.

Step 1 – Evaluate each term:

$$\log_2 8 = \log_2 2^3 = 3, \quad \log_2 16 = \log_2 2^4 = 4, \quad \log_2 32 = \log_2 2^5 = 5.$$

Step 2 – Sum:

$$3 + 4 + 5 = 12.$$

Why other options are wrong:

- Option A (9): Evaluates $\log_2 8 + \log_2 16 = 3 + 4 = 7$, or omits the last term and adds incorrectly.
- Option B (11): Evaluates $\log_2 32$ as 4 instead of 5: $3 + 4 + 4 = 11$.
- Option D (14): Evaluates $\log_2 32$ as 6 instead of 5: $3 + 4 + 6 = 13$ (still not 14); or evaluates $\log_2 16 = 5$ (error): $3 + 5 + 6 = 14$.

Final Answer: $3 + 4 + 5 = 12 \Rightarrow$ C

Answer: (C) [Go Back to Q 13](#)



Q14.

Solution

Concept – Geometric Progression: The n -th term of a GP is $a_n = a \cdot r^{n-1}$, where a is the first term and r is the common ratio.

Step 1 – Identify values: $a = 2$, $r = 3$, $n = 4$.

Step 2 – Compute the 4th term:

$$a_4 = 2 \times 3^{4-1} = 2 \times 3^3 = 2 \times 27 = 54.$$

Why other options are wrong:

- Option A (27): Computes $3^3 = 27$ but forgets to multiply by the first term $a = 2$.
- Option C (18): Computes $2 \times 3^2 = 18$; uses $n = 3$ (3rd term) instead of the 4th.
- Option D (162): Computes $2 \times 3^4 = 162$; uses r^n instead of r^{n-1} (off by one power).

Final Answer: 4th term = 54 $\Rightarrow$ **B**

Answer: (B) [Go Back to Q 14](#)

Q15.

Solution

Concept – Geometry: In an isosceles triangle, the two base angles are equal. The angle sum property gives: vertex angle + $2 \times$ (base angle) = 180.

Step 1 – Set up the equation:

$$40 + 2\theta = 180.$$

Step 2 – Solve for θ :

$$2\theta = 140 \implies \theta = 70.$$

Why other options are wrong:

- Option B (65): Would give $40 + 2(65) = 170 \neq 180$.
- Option C (75): Would give $40 + 2(75) = 190 \neq 180$.
- Option D (80): Would give $40 + 2(80) = 200 \neq 180$.



Final Answer: Each base angle = $70 \Rightarrow$ A

Answer: (A) [Go Back to Q 15](#)

Q16.

Solution

Concept – Circles: Tangents drawn from an external point to a circle are equal in length. This is a standard theorem in circle geometry.

Step 1 – State the theorem: If two tangents are drawn from the same external point P to a circle, then $PA = PB$.

Step 2 – Apply directly:

$$PA = 10 \text{ cm} \implies PB = 10 \text{ cm}.$$

Why other options are wrong:

- Option A (5 cm): Halves PA ; there is no halving relationship between the two tangent lengths.
- Option B (8 cm): An arbitrary value not derivable from the given information under any correct theorem.
- Option C (12 cm): Adds 2 to PA ; no theorem supports this.

Final Answer: $PB = 10 \text{ cm} \Rightarrow$ D

Answer: (D) [Go Back to Q 16](#)

Q17.

Solution

Concept – Mensuration – Sphere: Volume = $\frac{4}{3}\pi r^3$, Surface Area = $4\pi r^2$.

Step 1 – Find the radius from the volume:

$$\frac{4}{3}\pi r^3 = 288\pi \implies r^3 = \frac{288 \times 3}{4} = 216 \implies r = 6 \text{ cm}.$$

Step 2 – Calculate the surface area:

$$SA = 4\pi r^2 = 4\pi \times 36 = 144\pi \text{ cm}^2.$$



Why other options are wrong:

- Option A ($36\pi \text{ cm}^2$): Uses $r^2 = 9$, i.e., $r = 3$ (finds cube root of 27 by mistake: $288/4 \times 3 = 216$, but then takes $\sqrt{9} = 3$ instead of $\sqrt[3]{216} = 6$).
- Option B ($72\pi \text{ cm}^2$): Computes $4\pi \times (6^2/2) = 72\pi$; divides r^2 by 2 without reason.
- Option D ($108\pi \text{ cm}^2$): Computes $3\pi r^2 = 108\pi$ using factor 3 instead of 4 in the surface area formula.

Final Answer: Surface area = $144\pi \text{ cm}^2 \Rightarrow \boxed{\text{C}}$

Answer: (C) [Go Back to Q 17](#)

Q18.

Solution

Concept – Coordinate Geometry: Area of a triangle with vertices (x_1, y_1) , (x_2, y_2) , (x_3, y_3) :

$$\text{Area} = \frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|.$$

For a right triangle with legs along the axes, $\text{Area} = \frac{1}{2} \times \text{base} \times \text{height}$.

Step 1 – Identify the right angle at $A(0, 0)$. The base AB lies along the x -axis with length 6, and the height AC lies along the y -axis with length 8.

Step 2 – Compute the area:

$$\text{Area} = \frac{1}{2} \times 6 \times 8 = 24 \text{ sq. units.}$$

Why other options are wrong:

- Option A (20 sq. units): Uses $\frac{1}{2} \times 5 \times 8$ or $\frac{1}{2} \times 6 \times (8 - \frac{4}{3})$; incorrect base or height.
- Option C (30 sq. units): Uses $\frac{1}{2} \times 6 \times 10 = 30$, where 10 is the hypotenuse not the height.
- Option D (36 sq. units): Uses $6 \times 6 = 36$ or $\frac{1}{2} \times 9 \times 8 = 36$; incorrect dimensions.

Final Answer: Area = 24 sq. units $\Rightarrow \boxed{\text{B}}$

Answer: (B) [Go Back to Q 18](#)



Q19.

Solution

Concept – Mensuration – Cone: The slant height l , base radius r , and vertical height h of a right circular cone satisfy:

$$l = \sqrt{r^2 + h^2}.$$

Step 1 – Substitute $r = 5$ cm and $h = 12$ cm:

$$l = \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13 \text{ cm}.$$

Why other options are wrong:

- Option B (15 cm): $l^2 = 15^2 = 225 \neq 169$; uses the 5-12-13 triple incorrectly or recalls 9-12-15.
- Option C (14 cm): $14^2 = 196 \neq 169$; a common guess between 13 and 15.
- Option D (17 cm): $17^2 = 289 \neq 169$; confuses with the 8-15-17 Pythagorean triple.

Final Answer: Slant height = 13 cm $\Rightarrow$ **A**

Answer: (A) [Go Back to Q 19](#)

Q20.

Solution

Concept – Combinations: The number of ways to choose r items from n distinct items is $\binom{n}{r} = \frac{n!}{r!(n-r)!}$.

Step 1 – Choose 3 boys from 5:

$$\binom{5}{3} = \frac{5!}{3!2!} = \frac{5 \times 4}{2 \times 1} = 10.$$

Step 2 – Choose 2 girls from 4:

$$\binom{4}{2} = \frac{4!}{2!2!} = \frac{4 \times 3}{2 \times 1} = 6.$$



Step 3 – Multiply (by the rule of product):

$$10 \times 6 = 60.$$

Why other options are wrong:

- Option A (36): Computes $\binom{4}{2} \times \binom{4}{2} = 6 \times 6 = 36$; uses 4 boys instead of 5.
- Option B (48): Computes $8 \times 6 = 48$; uses $\binom{5}{2} = 10$ but pairs it with an error giving 8 for boys.
- Option C (80): Computes $\binom{5}{3} \times \binom{5}{2} = 10 \times 10 = 100$ or $\binom{5}{2} \times \binom{4}{2} = 10 \times 6 = 60$ (close but some compute $20 \times 4 = 80$).

Final Answer: $10 \times 6 = 60$ ways $\Rightarrow$ D

Answer: (D) [Go Back to Q 20](#)

Q21.

Solution

Concept – Probability: When two dice are thrown, the sample space has $6 \times 6 = 36$ equally likely outcomes. We count favourable outcomes where the sum is ≥ 9 .

Step 1 – List all pairs (d_1, d_2) with $d_1 + d_2 \geq 9$:

$$(3, 6), (4, 5), (4, 6), (5, 4), (5, 5), (5, 6), (6, 3), (6, 4), (6, 5), (6, 6).$$

Total favourable outcomes = 10.

Step 2 – Compute the probability:

$$P(\text{sum} \geq 9) = \frac{10}{36} = \frac{5}{18}.$$

Why other options are wrong:

- Option A ($1/3 = 12/36$): Over-counts; includes 2 additional pairs not summing to ≥ 9 .
- Option C ($1/4 = 9/36$): Under-counts by one; misses one valid pair such as $(3, 6)$.
- Option D ($7/36$): Counts only 7 pairs; misses 3 valid outcomes.

Final Answer: $P = \frac{5}{18} \Rightarrow$ B

Answer: (B) [Go Back to Q 21](#)



Q22.

Solution**Concept – Set Theory:** The union formula states:

$$n(A \cup B) = n(A) + n(B) - n(A \cap B).$$

Step 1 – Substitute the given values:

$$n(A \cup B) = 52 + 44 - 24 = 72.$$

Why other options are wrong:

- Option A (68): Subtracts both $n(A \cap B)$ and an extra 4; perhaps computes $52 + 44 - 24 - 4$.
- Option B (70): Off by 2; possibly uses $n(A \cap B) = 26$ instead of 24.
- Option D (76): Adds instead of subtracting: $52 + 44 - 20 = 76$ or uses $n(A \cap B) = 20$.

Final Answer: $n(A \cup B) = 72 \Rightarrow \boxed{\text{C}}$ **Answer: (C)** [Go Back to Q 22](#)

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	B	3	D	4	A	5	B
6	C	7	A	8	D	9	B	10	C
11	A	12	D	13	C	14	B	15	A
16	D	17	C	18	B	19	A	20	D
21	B	22	C						

Quick Reference: Correct Answers

Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	7	A	13	C	19	A
2	B	8	D	14	B	20	D
3	D	9	B	15	A	21	B
4	A	10	C	16	D	22	C
5	B	11	A	17	C		
6	C	12	D	18	B		

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