CAT Quantitative Aptitude Sample Paper – 3

Duration: 40 Minutes **Maximum Marks: 66**

Instructions

- This paper contains **22** questions modelled on the Quantitative Aptitude section of **CAT**, mixing single-correct **MCQs** and **TITA** (Type-In-The-Answer) questions.
- Each correct answer carries **+3 marks**. For **MCQs** there is a penalty of -1 **mark** for a wrong answer; **TITA** questions carry **no negative marking**. Unattempted questions score 0.
- For an MCQ, exactly **one** option is correct. For a TITA question, work out the numeric value and type it in (no options are given).
- A simple **on-screen calculator** is provided in the actual test interface; personal calculators, log tables and mobile phones are strictly prohibited.
- Recommended time is **40 minutes**, matching the real CAT sectional limit.

Section: Quantitative Aptitude

Q1. To pass an examination a candidate needs 35% of the maximum marks. A student scores 200 marks and still fails by 45 marks. The maximum marks of the examination are:

(A) 700

(B) 650

(C) 750

(D) 600

Q2. A trader sells two articles at the *same* selling price. On the first he gains 20% and on the second he loses 20%. His overall result on the two articles taken together is:

(A) No profit, no loss

(B) 4% loss

(C) 2% loss

(D) 4% profit

Q3. For three quantities, $a : b = 2 : 3$ and $b : c = 4 : 5$. The three are used to share a total of Rs. $10{,}500$ in the ratio $a : b : c$. The amount (in Rs.) received by the share corresponding to c is:

(TITA — type in the answer; no negative marking)

Q4. The difference between the compound interest and the simple interest on a certain sum for 2 years at 10% per annum is Rs. 50. The sum (principal) is:

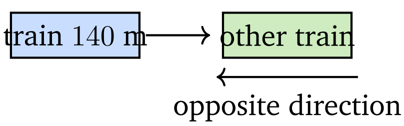
(A) Rs. $4{,}500$

(B) Rs. $6{,}000$

(C) Rs. $5{,}500$

(D) Rs. $5{,}000$

Q5. Two trains run in opposite directions on parallel tracks at 36 km/h and 54 km/h. One train is 140 m long, and they completely cross each other in 10 seconds. The length of the other train (in metres) is:



(A) 90

(B) 100

(C) 110

(D) 120

Q6. 12 men can complete a piece of work in 16 days. After they have worked for 4 days, 4 more men join them and all work together until the job is done. The total number of days taken to finish the work from the start is:

(TITA — type in the answer; no negative marking)

Q7. A vessel contains 40 litres of pure milk. 8 litres of milk are drawn out and replaced by the same quantity of water. The ratio of milk to water in the vessel now is:

(A) 4 : 1

(B) 5 : 1

(C) 3 : 1

(D) 5 : 4

Q8. The average age of 5 members of a club is 30 years. One member aged 25 years leaves and is replaced by a new member, after which the average age becomes 32 years. The age (in years) of the new member is:

(TITA — type in the answer; no negative marking)

Q9. Two pipes can fill a tank in 12 minutes and 15 minutes respectively, while a third (waste) pipe can empty the full tank in 20 minutes. If all three pipes are opened together with the tank empty, the time taken to fill it is:

(A) 8 minutes

(B) 10 minutes

(C) 12 minutes

(D) 15 minutes

Q10. At present a father's age is 3 times his son's age. After 12 years, the father will be only twice as old as his son. The father's present age (in years) is:

(A) 30

(B) 42

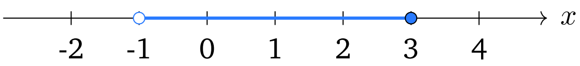
(C) 24

(D) 36

Q11. For the quadratic equation $x^2 - 7x + 10 = 0$, the sum of the squares of its two roots is:

(TITA — type in the answer; no negative marking)

Q12. The number of integer values of x satisfying the compound inequality $-3 < 2x - 1 \leq 5$ is (the shaded part of the line shows the solution set):



(A) 4

(B) 3

(C) 5

(D) 6

Q13. If $f(x) = \dfrac{x}{x-1}$ for $x \neq 1$, then $f\big(f(x)\big)$ simplifies to:

(A) $\dfrac{1}{x}$

(B) $x - 1$

(C) x

(D) $\dfrac{x}{x-1}$

Q14. The value of $\log_6 8 + \log_6 27$ is:

(TITA — type in the answer; no negative marking)

Q15. The sum to infinity of the geometric series $18 + 6 + 2 + \dfrac{2}{3} + \cdots$ (first term 18, common ratio $\frac{1}{3}$) is:

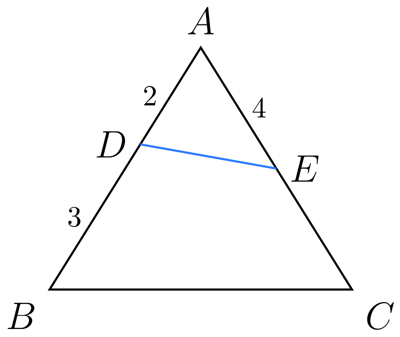
(A) 24

(B) 27

(C) 30

(D) 36

Q16. In triangle ABC, the line DE is drawn parallel to BC with D on AB and E on AC. If $AD = 2$ cm, $DB = 3$ cm and $AE = 4$ cm, then the length EC is:



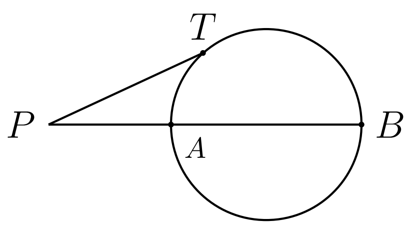
(A) 5 cm

(B) 4 cm

(C) 8 cm

(D) 6 cm

Q17. From an external point P, a tangent PT and a secant through P meeting the circle at A and B are drawn. If $PA = 4$ and $PB = 16$ (with A the nearer point), the length of the tangent PT is:



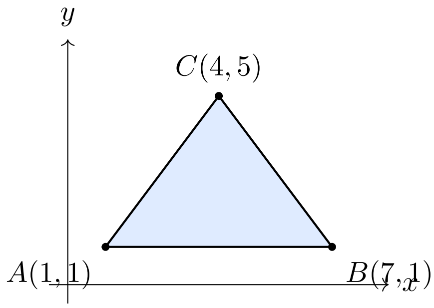
(A) 8

(B) 6

(C) 10

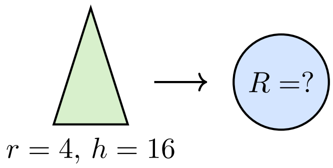
(D) 12

Q18. The area (in square units) of the triangle whose vertices are $A(1,1)$, $B(7,1)$ and $C(4,5)$ is:



(TITA — type in the answer; no negative marking)

Q19. A solid metal cone of base radius 4 cm and height 16 cm is melted and recast into a single solid sphere. The radius of the sphere (in cm) is:



(A) 6

(B) 8

(C) 4

(D) 5

Q20. The remainder when 876543 is divided by 11 is:

(TITA — type in the answer; no negative marking)

Q21. The largest number that divides both 64 and 90, leaving remainders 4 and 6 respectively, is:

(A) 6

(B) 12

(C) 8

(D) 24

Q22. The number of diagonals of a convex polygon having 12 sides is:

(TITA — type in the answer; no negative marking)

Detailed Solutions

Q1.

Solution

Concept — Pass mark from a failing score: The pass mark equals the student's score plus the marks by which the student falls short, and this pass mark is the stated percentage of the maximum marks.

Step 1 — Find the pass mark: The student scores 200 and fails by 45, so the pass mark $= 200 + 45 = 245$.

Step 2 — Relate to the maximum: The pass mark is 35% of the maximum M, so $0.35\,M = 245$.

Step 3 — Solve for M: $M = \dfrac{245}{0.35} = 700$.

Step 4 — Quick check: 35% of $700 = 245$, and $245 - 200 = 45$, matching the shortfall.

Why other options are wrong:

- $650, 750, 600$: none gives a 35% pass mark exactly 45 above 200.

Final Answer: 700 marks $\Rightarrow$ $\boxed{\text{A}}$

Answer: (A) Go Back to Q 1

Q2.

Solution

Concept — Equal selling price, equal $\pm x\%$: When the same selling price is gained on one article and lost on another at the same percentage x, the result is always a net loss of $\left(\dfrac{x}{10}\right)^2\%$.

Step 1 — Take the common selling price as 120: For the first article (gain 20%), cost $= \dfrac{120}{1.20} = 100$.

Step 2 — Cost of the second article (loss 20%): Cost $= \dfrac{120}{0.80} = 150$.

Step 3 — Totals: Total cost $= 100+150 = 250$; total selling price $= 120+120 = 240$.

Step 4 — Net result: Loss $= 250 - 240 = 10$ on a cost of 250, so loss percent $= \dfrac{10}{250} \times 100 = 4\%$.

Step 5 — Formula check: $\left(\frac{20}{10}\right)^2 = 2^2 = 4\%$ loss, confirming Step 4.

Why other options are wrong:

- "No profit, no loss" and "4% profit": equal $\pm x\%$ on equal selling prices can never give a profit or a break-even.
- 2% loss: comes from halving the correct loss instead of using $(x/10)^2$.

Final Answer: 4% loss $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 2

Q3.

Solution

Concept — Chaining two ratios: To combine $a : b$ and $b : c$, scale them so the common term b matches, then read off $a : b : c$ and share the total in those parts.

Step 1 — Make b common: $a : b = 2 : 3$ and $b : c = 4 : 5$. The values of b are 3 and 4, whose LCM is 12.

Step 2 — Scale each ratio: Multiply $2 : 3$ by 4 to get $8 : 12$; multiply $4 : 5$ by 3 to get $12 : 15$.

Step 3 — Write the combined ratio: $a : b : c = 8 : 12 : 15$.

Step 4 — Total parts: $8 + 12 + 15 = 35$ parts, so one part $= \frac{10500}{35} = 300$.

Step 5 — Share for c: c has 15 parts, so $c = 15 \times 300 = 4500$.

Common errors: Forgetting to scale both ratios to a common b, or dividing the total by 3 (the ratio terms) instead of 35 (total parts).

Final Answer: Rs. 4500 $\Rightarrow$ $\boxed{4500}$

Answer: (4500) Go Back to Q 3

Q4.

Solution

Concept — CI−SI for 2 years: For 2 years the difference between compound and simple interest is $P\left(\frac{r}{100}\right)^2$, since the extra arises from interest on the first year's interest.

Step 1 — Write the difference formula: Difference $= P\left(\frac{r}{100}\right)^2$.

Step 2 — Substitute $r = 10$: $\left(\frac{10}{100}\right)^2 = \left(\frac{1}{10}\right)^2 = \frac{1}{100}$.

Step 3 — Set equal to 50: $P \times \frac{1}{100} = 50$.

Step 4 — Solve for P: $P = 50 \times 100 = 5000$.

Why other options are wrong:

- $4500, 6000, 5500$: do not satisfy $\frac{P}{100} = 50$.

Final Answer: Rs. $5000 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 4

Q5.

Solution

Concept — Two trains crossing in opposite directions: When two trains move in opposite directions, their speeds add. The total distance covered while crossing equals the sum of their lengths.

Step 1 — Relative speed in km/h: Opposite directions, so add: $36 + 54 = 90$ km/h.

Step 2 — Convert to m/s: $90 \times \frac{5}{18} = 25$ m/s.

Step 3 — Distance covered in 10 s: $25 \times 10 = 250$ m.

Step 4 — This equals the sum of the lengths: $140 + L = 250$.

Step 5 — Solve for L: $L = 250 - 140 = 110$ m.

Why other options are wrong:

- 90: subtracts the speeds (would be the same-direction case).
- $100, 120$: arithmetic slips in the conversion or subtraction.

Final Answer: 110 m $\Rightarrow$ $\boxed{C}$

Answer: (C) Go Back to Q 5

Q6.

Solution

Concept — Man-days stay constant: The total work measured in man-days is fixed. Track how much is done before and after the extra men join.

Step 1 — Total work in man-days: 12 men $\times$ 16 days $=$ 192 man-days.

Step 2 — Work done in the first 4 days: 12 men $\times$ 4 days $=$ 48 man-days.

Step 3 — Remaining work: $192 - 48 = 144$ man-days.

Step 4 — Strength after 4 more men join: $12 + 4 = 16$ men.

Step 5 — Days for the remaining work: $\frac{144}{16} = 9$ days.

Step 6 — Total days from the start: $4 + 9 = 13$ days.

Common errors: Reporting only the 9 additional days instead of the total, or forgetting to add the new men.

Final Answer: 13 days $\Rightarrow$ $\boxed{13}$

Answer: (13) Go Back to Q 6

Q7.

Solution

Concept — Single replacement of milk by water: The water added equals the milk removed, so the volume stays 40 litres while the milk drops by the amount drawn off.

Step 1 — Milk left after drawing off: $40 - 8 = 32$ litres of milk remain.

Step 2 — Water added: 8 litres of water replace the milk drawn out.

Step 3 — Form the ratio: milk : water $= 32 : 8$.

Step 4 — Simplify: Divide both by 8: $32 : 8 = 4 : 1$.

Why other options are wrong:

- $5 : 1$: would need only $\frac{40}{6}$ litres removed, not 8.

- $3:1, 5:4$: do not reduce from $32:8$.

Final Answer: $4:1 \Rightarrow \boxed{A}$

Answer: (A) Go Back to Q 7

Q8.

Solution

Concept — Replacing one member: When one member is swapped for another, the change in the group total equals the group size times the change in the average.

Step 1 — Old total age: $5 \times 30 = 150$ years.

Step 2 — New total age: $5 \times 32 = 160$ years.

Step 3 — Change in total: $160 - 150 = 10$ years more.

Step 4 — Find the new member's age: The leaving member was 25; the total rose by 10, so new member $= 25 + 10 = 35$ years.

Common errors: Adding the change to the average rather than to the leaving member's age, or using a wrong group size.

Final Answer: 35 years $\Rightarrow \boxed{35}$

Answer: (35) Go Back to Q 8

Q9.

Solution

Concept — Filling and emptying together: Add the filling rates and subtract the emptying rate. The reciprocal of the net rate gives the time to fill.

Step 1 — Individual rates: Fillers $\frac{1}{12}$ and $\frac{1}{15}$ per minute; waste pipe $\frac{1}{20}$ per minute (emptying).

Step 2 — Use a common denominator 60: $\frac{1}{12} = \frac{5}{60}, \frac{1}{15} = \frac{4}{60}, \frac{1}{20} = \frac{3}{60}$.

Step 3 — Net rate: $\frac{5}{60} + \frac{4}{60} - \frac{3}{60} = \frac{6}{60} = \frac{1}{10}$ per minute.

Step 4 — Time to fill: Reciprocal of $\frac{1}{10}$ is 10 minutes.

Why other options are wrong:

- 8: forgets to subtract the waste pipe.
- $12, 15$: come from dropping one of the filling pipes.

Final Answer: 10 minutes $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 9

Q10.

Solution

Concept — Ages with two conditions: Let the son's present age be the unknown, write the father's age in terms of it, then translate the "after 12 years" condition into an equation.

Step 1 — Name the present ages: Let the son be s; then the father is $3s$.

Step 2 — Ages after 12 years: Son $= s + 12$, father $= 3s + 12$.

Step 3 — Apply the future condition: $3s + 12 = 2(s + 12)$.

Step 4 — Expand and solve: $3s + 12 = 2s + 24 \Rightarrow 3s - 2s = 24 - 12 \Rightarrow s = 12$.

Step 5 — Father's present age: $3s = 3 \times 12 = 36$ years.

Why other options are wrong:

- 24: this is the son's age after 12 years, not the father's present age.
- $30, 42$: do not satisfy both age conditions together.

Final Answer: 36 years $\Rightarrow$ $\boxed{\text{D}}$

Answer: (D) Go Back to Q 10

Q11.

Solution

Concept — Sum of squares from Vieta's: For roots with sum S and product P, the sum of their squares is $S^2 - 2P$, since $(\alpha + \beta)^2 = \alpha^2 + \beta^2 + 2\alpha\beta$.

Step 1 — Read off sum and product: For $x^2 - 7x + 10 = 0$, sum of roots $S = 7$ and product $P = 10$.

Step 2 — Apply the identity: $\alpha^2 + \beta^2 = S^2 - 2P$.

Step 3 — Substitute: $= 7^2 - 2 \times 10 = 49 - 20$.

Step 4 — Compute: $49 - 20 = 29$.

Common errors: Forgetting the $-2P$ term, or taking the product as -10.

Final Answer: $29 \Rightarrow \boxed{29}$

Answer: (29) Go Back to Q 11

Q12.

Solution

Concept — Solving a compound inequality: Work the same operation on all three parts of $-3 < 2x - 1 \leq 5$ to isolate x, then count the integers in the resulting interval.

Step 1 — Add 1 throughout: $-3 + 1 < 2x \leq 5 + 1$, i.e. $-2 < 2x \leq 6$.

Step 2 — Divide throughout by 2: $-1 < x \leq 3$.

Step 3 — Identify the integers: The left end -1 is excluded (strict), the right end 3 is included. Integers are $0, 1, 2, 3$.

Step 4 — Count them: That is 4 integer values.

Why other options are wrong:

- 5: wrongly includes $x = -1$, which fails the strict inequality.
- $3, 6$: miscount the endpoints of the interval.

Final Answer: 4 integers $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 12

Q13.

Solution

Concept — Function composition: Substitute $f(x)$ into f again and simplify the resulting compound fraction.

Step 1 — Write the inner value: Let $u = f(x) = \dfrac{x}{x-1}$.

Step 2 — Form $f(u)$: $f(u) = \dfrac{u}{u-1} = \dfrac{\frac{x}{x-1}}{\frac{x}{x-1} - 1}$.

Step 3 — Simplify the denominator: $\dfrac{x}{x-1} - 1 = \dfrac{x-(x-1)}{x-1} = \dfrac{1}{x-1}$.

Step 4 — Divide: $f(u) = \frac{\frac{x}{x-1}}{\frac{1}{x-1}} = \frac{x}{x-1} \times (x-1) = x.$

Step 5 — Conclusion: $f\big(f(x)\big) = x$, so f is its own inverse.

Why other options are wrong:

- $\frac{1}{x}, x-1$: result from cancelling incorrectly inside the compound fraction.
- $\frac{x}{x-1}$: this is $f(x)$ itself, not the composition.

Final Answer: $x \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 13

Q14.

Solution

Concept — Adding logs with the same base: $\log_b M + \log_b N = \log_b(MN)$. Multiply the arguments, then express the product as a power of the base.

Step 1 — Combine the two logs: $\log_6 8 + \log_6 27 = \log_6(8 \times 27)$.

Step 2 — Multiply the arguments: $8 \times 27 = 216$.

Step 3 — Express as a power of 6: $216 = 6^3$ (since $6 \times 6 \times 6 = 216$).

Step 4 — Evaluate: $\log_6 6^3 = 3$.

Common errors: Multiplying the logarithms instead of their arguments, or not recognising $216 = 6^3$.

Final Answer: $3 \Rightarrow \boxed{3}$

Answer: (3) Go Back to Q 14

Q15.

Solution

Concept — Sum of an infinite GP: When $|r| < 1$, the sum to infinity is $S_\infty = \frac{a}{1-r}$, where a is the first term and r the common ratio.

Step 1 — Identify a and r: First term $a = 18$; common ratio $r = \frac{6}{18} = \frac{1}{3}$, and $|r| < 1$.

Step 2 — Compute $1 - r$: $1 - \frac{1}{3} = \frac{2}{3}$.

Step 3 — Apply the formula: $S_\infty = \dfrac{18}{\frac{2}{3}} = 18 \times \dfrac{3}{2}$.

Step 4 — Simplify: $18 \times \dfrac{3}{2} = 27$.

Why other options are wrong:

- $24, 30, 36$: come from using a wrong ratio or from multiplying by $\frac{2}{3}$ instead of dividing.

Final Answer: $27 \Rightarrow \boxed{B}$

Answer: (B) Go Back to Q 15

Q16.

Solution

Concept — Basic Proportionality Theorem: A line parallel to one side of a triangle divides the other two sides in the same ratio: $\dfrac{AD}{DB} = \dfrac{AE}{EC}$.

Step 1 — Write the proportion: $\dfrac{AD}{DB} = \dfrac{AE}{EC}$.

Step 2 — Substitute the known lengths: $\dfrac{2}{3} = \dfrac{4}{EC}$.

Step 3 — Cross-multiply: $2 \times EC = 3 \times 4 = 12$.

Step 4 — Solve for EC: $EC = \dfrac{12}{2} = 6$ cm.

Why other options are wrong:

- $5, 4, 8$: do not satisfy $\dfrac{2}{3} = \dfrac{4}{EC}$.

Final Answer: $EC = 6 \text{ cm} \Rightarrow \boxed{D}$

Answer: (D) Go Back to Q 16

Q17.

Solution

Concept — Tangent-secant relation: From an external point, the square of the tangent length equals the product of the whole secant and its external part: $PT^2 = PA \cdot PB$.

Step 1 — Write the relation: $PT^2 = PA \cdot PB$.

Step 2 — Substitute the values: $PT^2 = 4 \times 16 = 64$.

Step 3 — Take the square root: $PT = \sqrt{64} = 8$.

Why other options are wrong:

- 6: would need $PA \cdot PB = 36$, not 64.
- $10, 12$: do not square to 64.

Final Answer: $PT = 8 \Rightarrow \boxed{A}$

Answer: (A) Go Back to Q 17

Q18.

Solution

Concept — Area from coordinates: The area of a triangle with vertices $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ is $\frac{1}{2}\left|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)\right|$.

Step 1 — Use the base on the line $y = 1$: AB runs from $(1, 1)$ to $(7, 1)$, a horizontal base of length $7 - 1 = 6$.

Step 2 — Find the height: The height is the vertical distance from $C(4, 5)$ to the line $y = 1$, which is $5 - 1 = 4$.

Step 3 — Apply area $= \frac{1}{2} \times$ base $\times$ height: $\frac{1}{2} \times 6 \times 4 = 12$.

Step 4 — Cross-check with the formula: $\frac{1}{2}|1(1-5) + 7(5-1) + 4(1-1)| = \frac{1}{2}|-4 + 28 + 0| = \frac{1}{2} \times 24 = 12$.

Common errors: Using the raw y-coordinate 5 as the height instead of the distance $5 - 1 = 4$ from the base.

Final Answer: 12 square units $\Rightarrow \boxed{12}$

Answer: (12) Go Back to Q 18

Q19.

Solution

Concept — Volume is conserved on recasting: Melting and recasting keeps the metal volume the same, so the cone's volume equals the sphere's volume.

Step 1 — Volume of the cone: $\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi(4)^2(16) = \frac{1}{3}\pi \times 16 \times 16 = \frac{256}{3}\pi.$

Step 2 — Volume of the sphere: $\frac{4}{3}\pi R^3.$

Step 3 — Equate the volumes: $\frac{4}{3}\pi R^3 = \frac{256}{3}\pi.$

Step 4 — Cancel $\frac{\pi}{3}$ and solve: $4R^3 = 256 \Rightarrow R^3 = 64.$

Step 5 — Take the cube root: $R = \sqrt[3]{64} = 4$ cm.

Why other options are wrong:

- $6, 8, 5$: do not satisfy $R^3 = 64$.

Final Answer: $R = 4$ cm $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 19

Q20.

Solution

Concept — Divisibility by 11: The remainder on dividing by 11 is governed by the alternating sum of the digits (taken from the right), reduced to a value between 0 and 10.

Step 1 — List the digits of 876543: From the right they are $3, 4, 5, 6, 7, 8$.

Step 2 — Form the alternating sum: $3 - 4 + 5 - 6 + 7 - 8$.

Step 3 — Add step by step: $3 - 4 = -1$; $-1 + 5 = 4$; $4 - 6 = -2$; $-2 + 7 = 5$; $5 - 8 = -3$.

Step 4 — Reduce modulo 11: $-3 + 11 = 8$, so the remainder is 8.

Step 5 — Quick check: $11 \times 79685 = 876535$, and $876543 - 876535 = 8$. Confirmed.

Common errors: Starting the alternating signs from the wrong end, or leaving the answer as -3 instead of adding 11.

Final Answer: Remainder $= 8 \Rightarrow \boxed{8}$

Answer: (8) Go Back to Q 20

Q21.

Solution

Concept — Largest divisor leaving fixed remainders: If a number leaves remainder r on dividing N, then it divides $N - r$ exactly. The required largest number is the HCF of the adjusted values.

Step 1 — Adjust each number: $64 - 4 = 60$ and $90 - 6 = 84$.

Step 2 — Prime factorise: $60 = 2^2 \times 3 \times 5$ and $84 = 2^2 \times 3 \times 7$.

Step 3 — Take the common factors: Shared part is $2^2 \times 3 = 12$.

Step 4 — HCF: $\text{HCF}(60, 84) = 12$, so the largest such number is 12.

Step 5 — Verify: $64 \div 12$ leaves 4 (since $12 \times 5 = 60$); $90 \div 12$ leaves 6 (since $12 \times 7 = 84$). Correct.

Why other options are wrong:

- $6, 8$: are smaller common divisors, not the largest.
- 24: does not divide either 60 or 84.

Final Answer: $12 \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 21

Q22.

Solution

Concept — Diagonals of a polygon: A convex polygon with n sides has $\dfrac{n(n-3)}{2}$ diagonals, since each vertex joins to $n-3$ non-adjacent vertices and each diagonal is counted twice.

Step 1 — Identify n: The polygon has $n = 12$ sides.

Step 2 — Substitute into the formula: $\dfrac{n(n-3)}{2} = \dfrac{12 \times (12-3)}{2}$.

Step 3 — Simplify the bracket: $12 - 3 = 9$, so it becomes $\dfrac{12 \times 9}{2}$.

Step 4 — Compute: $\dfrac{108}{2} = 54$.

Common errors: Using $n(n-3)$ without halving (double counting each diagonal), or taking $n-1$ instead of $n-3$.

Final Answer: 54 diagonals $\Rightarrow \boxed{54}$

Answer: (54) Go Back to Q 22

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	B	3	4500	4	D	5	C
6	13	7	A	8	35	9	B	10	D
11	29	12	A	13	C	14	3	15	B
16	D	17	A	18	12	19	C	20	8
21	B	22	54						