CAT Quantitative Aptitude
Sample Paper – 5

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. The price of an article is first increased by 20% and then the new price is decreased by 15%. The net percentage change in the price is:

(A) an increase of 3%

(B) an increase of 2%

(C) a decrease of 2%

(D) an increase of 5%

Q2. A retailer offers two successive discounts of 20% and 10% on the marked price of a product. The single discount equivalent to these two successive discounts is:

(A) 28%

(B) 30%

(C) 25%

(D) 26%

Q3. A box contains one-rupee, fifty-paise and twenty-five-paise coins in the ratio $1 : 2 : 3$ (by number). If the total value of all the coins is Rs. 110, the number of twenty-five-paise coins in the box is:

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

Q4. A sum of Rs. 12,500 is invested at 8% per annum, compounded annually. The amount (in Rs.) at the end of 2 years is:

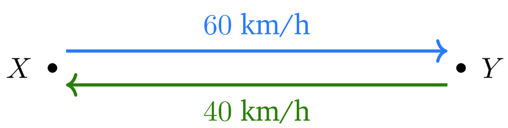
(A) Rs. 14,400

(B) Rs. 13,500

(C) Rs. 14,600

(D) Rs. 14,580

Q5. A man travels from town X to town Y at a speed of 60 km/h and returns along the same road from Y to X at a speed of 40 km/h. His average speed (in km/h) for the entire to-and-fro journey is:



(A) 50

(B) 45

(C) 48

(D) 52

Q6. A is twice as efficient as B. Working together, A and B can finish a piece of work in 8 days. The number of days that B alone would take to finish the same work is:

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

Q7. A vessel contains 40 litres of an acid solution in which the acid is 15% by volume. The quantity of water (in litres) that must be added to bring the acid concentration down to 10% is:

(A) 20

(B) 15

(C) 25

(D) 18

Q8. The average of the first 99 natural numbers $(1, 2, 3, \ldots, 99)$ is:

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

Q9. Two pipes can fill a tank in 8 hours and 12 hours respectively, while a third (outlet) pipe can empty the full tank in 24 hours. If all three pipes are opened together when the tank is empty, the time taken to fill the tank is:

(A) 8 hours

(B) 6 hours

(C) 9 hours

(D) 4 hours

Q10. Two numbers have a sum of 24 and a difference of 10. The product of the two numbers is:

(A) 119

(B) 120

(C) 110

(D) 144

Q11. The quadratic equation $x^2 - 8x + k = 0$ has two equal (real and repeated) roots. The value of k is:

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

Q12. The number of integers x that satisfy the inequality $x^2 - 7x + 12 < 0$ is (the open segment shows the solution region):

(A) 0

(B) 1

(C) 2

(D) 3

Q13. If $f(x) = 3x - 7$ is an invertible function, then the value of $f^{-1}(8)$ is:

(A) 4

(B) 6

(C) 5

(D) 17

Q14. The value of $\log_{10} 8 + \log_{10} 125$ is:

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

Q15. In an arithmetic progression whose first term is 4 and common difference is 4, the sum of the first n terms is 312. The number of terms n is:

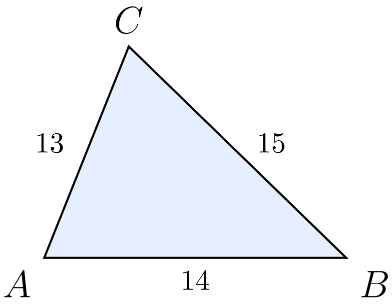
(A) 10

(B) 12

(C) 14

(D) 13

Q16. The sides of the triangle below are 13 cm, 14 cm and 15 cm. Its area (in square cm) is:



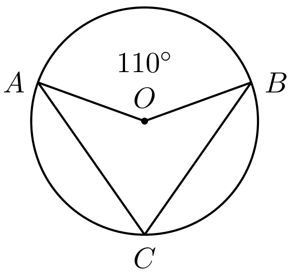
(A) 90

(B) 78

(C) 80

(D) 84

Q17. In the circle with centre O, the central angle $\angle AOB$ subtending arc AB is $110°$. The inscribed angle $\angle ACB$ subtending the same arc AB from a point C on the major arc is:



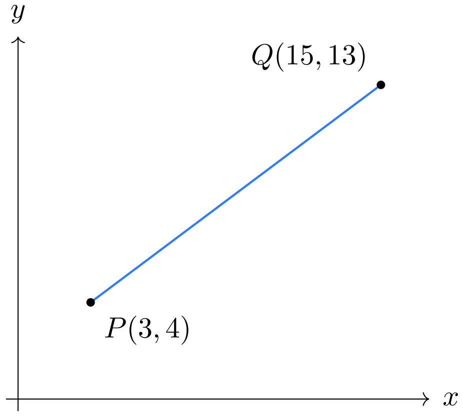
(A) $50°$

(B) $55°$

(C) $60°$

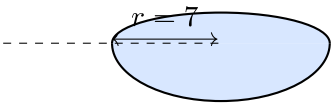
(D) $70°$

Q18. The distance between the points $P(3, 4)$ and $Q(15, 13)$ in the coordinate plane is:



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

Q19. A solid hemisphere has radius 7 cm. Taking $\pi = \frac{22}{7}$, its total surface area (in square cm) is:



(A) 308

(B) 616

(C) 462

(D) 154

Q20. The number of trailing zeros at the end of $80!$ (that is, 80 factorial) is:

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

Q21. The total number of positive factors (divisors) of 432 is:

(A) 18

(B) 24

(C) 16

(D) 20

Q22. There are 8 points in a plane, no three of which are collinear. The number of triangles that can be formed by joining these points is:

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

Detailed Solutions

Q1.

Solution

Concept — Successive percentage change: A rise of $a\%$ followed by a fall of $b\%$ multiplies the original quantity by $\left(1+\frac{a}{100}\right)\left(1-\frac{b}{100}\right)$.

Step 1 — Write the multiplying factor: A rise of 20% then a fall of 15% gives the factor 1.20×0.85.

Step 2 — Multiply the two factors: $1.20 \times 0.85 = 1.02$.

Step 3 — Read off the net change: A factor of 1.02 means the price becomes 102% of the original.

Step 4 — State the percentage change: $102\% - 100\% = +2\%$, i.e. a net increase of 2%.

Why other options are wrong:

- Increase of 5%: comes from naively subtracting $20 - 15 = 5$ and ignoring the cross term.
- Decrease of 2%: a sign error; the factor 1.02 is above 1, so it is a rise.
- Increase of 3%: an arithmetic slip in 1.20×0.85.

Final Answer: an increase of $2\% \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 1

Q2.

Solution

Concept — Successive discounts: Each discount multiplies the price by $(1 - \text{discount})$. The single equivalent discount is found from the combined surviving fraction.

Step 1 — Take the marked price as 100: Work with a base of 100 for convenience.

Step 2 — Apply the first discount of 20%: Price becomes $100 \times (1 - 0.20) = 100 \times 0.80 = 80$.

Step 3 — Apply the second discount of 10%: Price becomes $80 \times (1 - 0.10) = 80 \times 0.90 = 72$.

Step 4 — Find the single equivalent discount: The final price is 72, so the total discount is $100 - 72 = 28$, i.e. 28%.

Why other options are wrong:

- 30%: simply adds $20 + 10$, ignoring that the second discount acts on the already reduced price.
- $25\%, 26\%$: arithmetic slips in the chained multiplication.

Final Answer: $28\% \Rightarrow \boxed{A}$

Answer: (A) Go Back to Q 2

Q3.

Solution

Concept — Ratio by number of coins: If the numbers of coins are in a ratio, scale them by a common multiplier x, write the total value, and solve for x.

Step 1 — Name the counts: Let the numbers of one-rupee, fifty-paise and twenty-five-paise coins be x, $2x$ and $3x$.

Step 2 — Write each value in rupees: One-rupee coins give $x \times 1 = x$; fifty-paise coins give $2x \times 0.50 = x$; twenty-five-paise coins give $3x \times 0.25 = 0.75x$.

Step 3 — Add the values: Total $= x + x + 0.75x = 2.75x$.

Step 4 — Set equal to the total amount: $2.75x = 110$.

Step 5 — Solve for x: $x = \dfrac{110}{2.75} = 40$.

Step 6 — Count the twenty-five-paise coins: They number $3x = 3 \times 40 = 120$.

Common errors: Reading the ratio as values instead of counts, or forgetting that a fifty-paise coin is worth Rs. 0.50.

Final Answer: 120 coins $\Rightarrow \boxed{120}$

Answer: (120) Go Back to Q 3

Q4.

Solution

Concept — Compound interest amount: $A = P\left(1 + \frac{r}{100}\right)^n$, where P is the principal, r the annual rate and n the number of years.

Step 1 — Write the growth factor: At 8% for 2 years the factor is $(1.08)^2$.

Step 2 — Evaluate the factor: $(1.08)^2 = 1.1664$.

Step 3 — Multiply by the principal: $A = 12500 \times 1.1664 = 14580$.

Step 4 — Quick check year by year: $12500 \times 1.08 = 13500$; then $13500 \times 1.08 = 14580$. Confirmed.

Why other options are wrong:

- Rs. $13{,}500$: this is the amount after only one year, not two.
- Rs. $14{,}400$: uses simple interest $(12500 + 2 \times 1000)$, not compound.
- Rs. $14{,}600$: an arithmetic slip in the second year's growth.

Final Answer: Rs. $14{,}580 \Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 4

Q5.

Solution

Concept — Average speed for equal distances: When the same distance is covered at speeds u and v, the average speed is the harmonic mean $\frac{2uv}{u+v}$, not the arithmetic mean.

Step 1 — Identify the two speeds: $u = 60$ km/h (onward) and $v = 40$ km/h (return).

Step 2 — Write the average-speed formula: Average speed $= \frac{2uv}{u+v}$.

Step 3 — Substitute the values: $\frac{2 \times 60 \times 40}{60 + 40} = \frac{4800}{100}$.

Step 4 — Simplify: $\frac{4800}{100} = 48$ km/h.

Why other options are wrong:

- 50: the arithmetic mean $\frac{60+40}{2}$, which is wrong for equal distances.
- $45, 52$: arithmetic slips in the harmonic-mean computation.

Final Answer: 48 km/h $\Rightarrow$ $\boxed{\text{C}}$

Answer: (C) Go Back to Q 5

Q6.

Solution

Concept — Efficiency and combined work: If A is twice as efficient as B, then A does twice as much work per day. Combined rate is the sum of the individual rates.

Step 1 — Name the rates: Let B's rate be b (work per day); then A's rate is $2b$.

Step 2 — Write the combined rate: Together they do $2b + b = 3b$ per day.

Step 3 — Use the joint time: They finish in 8 days, so $3b = \frac{1}{8}$.

Step 4 — Solve for b: $b = \frac{1}{8 \times 3} = \frac{1}{24}$ of the work per day.

Step 5 — Time for B alone: Since B does $\frac{1}{24}$ per day, B takes 24 days.

Common errors: Splitting the 8 days as 4 and 4, or giving A's alone time (12 days) instead of B's.

Final Answer: 24 days $\Rightarrow$ $\boxed{24}$

Answer: (24) Go Back to Q 6

Q7.

Solution

Concept — Adding water keeps the solute fixed: Adding pure water does not change the amount of acid; only the total volume grows. Use the fixed acid amount to find the new total.

Step 1 — Find the amount of acid: 15% of 40 litres $= 0.15 \times 40 = 6$ litres of acid.

Step 2 — Set up the target concentration: After adding water, the 6 litres of acid must be 10% of the new total T, so $0.10\,T = 6$.

Step 3 — Solve for the new total: $T = \frac{6}{0.10} = 60$ litres.

Step 4 — Find the water added: Water added $= T - 40 = 60 - 40 = 20$ litres.

Why other options are wrong:

- $15, 18$: come from taking a wrong new total or misreading the percentage.
- 25: would dilute the acid below 10%.

Final Answer: 20 litres $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 7

Q8.

Solution

Concept — Average of consecutive natural numbers: The average of the first n natural numbers is $\frac{n+1}{2}$ (the middle value of an evenly spaced list).

Step 1 — Write the sum of the first n numbers: $1 + 2 + \cdots + n = \frac{n(n+1)}{2}$.

Step 2 — Divide by the count: Average $= \frac{1}{n} \times \frac{n(n+1)}{2} = \frac{n+1}{2}$.

Step 3 — Substitute $n = 99$: Average $= \frac{99+1}{2} = \frac{100}{2}$.

Step 4 — Simplify: $\frac{100}{2} = 50$.

Common errors: Using $\frac{n}{2} = 49.5$ instead of $\frac{n+1}{2}$, or dividing the sum by 100 rather than 99.

Final Answer: $50 \Rightarrow \boxed{50}$

Answer: (50) Go Back to Q 8

Q9.

Solution

Concept — Net filling rate: Filling pipes add to the rate, an emptying pipe subtracts. The time to fill is the reciprocal of the net rate.

Step 1 — Write each rate per hour: Pipe 1 $= \frac{1}{8}$, Pipe 2 $= \frac{1}{12}$, outlet $= -\frac{1}{24}$.

Step 2 — Use a common denominator of 24: $\frac{1}{8} = \frac{3}{24}$, $\frac{1}{12} = \frac{2}{24}$, $\frac{1}{24} = \frac{1}{24}$.

Step 3 — Add the net rate: $\frac{3}{24} + \frac{2}{24} - \frac{1}{24} = \frac{4}{24} = \frac{1}{6}$ per hour.

Step 4 — Take the reciprocal: Time to fill $= \frac{1}{1/6} = 6$ hours.

Why other options are wrong:

- $8, 9, 4$: come from adding all three as fillers or from a sign slip on the outlet pipe.

Final Answer: 6 hours $\Rightarrow$ $\boxed{\text{B}}$

Answer: (B) Go Back to Q 9

Q10.

Solution

Concept — Sum and difference of two numbers: If two numbers have sum S and difference D, they are $\frac{S+D}{2}$ and $\frac{S-D}{2}$.

Step 1 — Write the two equations: Let the numbers be a and b with $a + b = 24$ and $a - b = 10$.

Step 2 — Find the larger number: Adding the equations: $2a = 34 \Rightarrow a = 17$.

Step 3 — Find the smaller number: $b = 24 - 17 = 7$.

Step 4 — Compute the product: $a \times b = 17 \times 7 = 119$.

Why other options are wrong:

- $120, 110$: arithmetic slips in 17×7.
- 144: would need both numbers equal to 12, which contradicts the difference of 10.

Final Answer: $119 \Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 10

Q11.

Solution

Concept — Equal roots and the discriminant: A quadratic $ax^2 + bx + c = 0$ has equal roots exactly when its discriminant $b^2 - 4ac = 0$.

Step 1 — Read off the coefficients: For $x^2 - 8x + k = 0$, $a = 1$, $b = -8$, $c = k$.

Step 2 — Write the discriminant: $b^2 - 4ac = (-8)^2 - 4(1)(k) = 64 - 4k$.

Step 3 — Set it to zero: $64 - 4k = 0$.

Step 4 — Solve for k: $4k = 64 \Rightarrow k = 16$.

Common errors: Using $b^2 - 4ac > 0$ (distinct roots) or forgetting that $b = -8$ still gives $b^2 = 64$.

Final Answer: $k = 16 \Rightarrow \boxed{16}$

Answer: (16) Go Back to Q 11

Q12.

Solution

Concept — Sign of a factorised quadratic: For $(x-p)(x-q) < 0$ with $p < q$, the product is negative only between the roots, giving $p < x < q$.

Step 1 — Factorise the quadratic: $x^2 - 7x + 12 = (x-3)(x-4)$.

Step 2 — Solve the inequality: $(x-3)(x-4) < 0$ holds for $3 < x < 4$.

Step 3 — Look for integers in the interval: The open interval $(3, 4)$ contains no integer (it lies strictly between 3 and 4).

Step 4 — Count them: The number of integers satisfying the inequality is 0.

Why other options are wrong:

- 2: wrongly includes the endpoints 3 and 4, but the inequality is strict ($<$, not $\leq$).
- $1, 3$: count integers that are not strictly inside $(3, 4)$.

Final Answer: 0 integers $\Rightarrow \boxed{\text{A}}$

Answer: (A) Go Back to Q 12

Q13.

Solution

Concept — Inverse of a linear function: If $f(x) = mx + c$, then $f^{-1}(y)$ is the x that satisfies $f(x) = y$; solve $mx + c = y$ for x.

Step 1 — Set up the equation: We need x with $f(x) = 8$, i.e. $3x - 7 = 8$.

Step 2 — Move the constant: $3x = 8 + 7 = 15$.

Step 3 — Solve for x: $x = \frac{15}{3} = 5$.

Step 4 — State the inverse value: Hence $f^{-1}(8) = 5$.

Why other options are wrong:

- 17: this is $f(8) = 3(8) - 7$, the forward value, not the inverse.
- $4, 6$: arithmetic slips in solving $3x = 15$.

Final Answer: $f^{-1}(8) = 5 \Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 13

Q14.

Solution

Concept — Product rule for logarithms: $\log_b M + \log_b N = \log_b(MN)$, and $\log_{10} 10^k = k$.

Step 1 — Combine the two logs: $\log_{10} 8 + \log_{10} 125 = \log_{10}(8 \times 125)$.

Step 2 — Multiply inside: $8 \times 125 = 1000$.

Step 3 — Write as a power of ten: $1000 = 10^3$, so $\log_{10} 1000 = \log_{10} 10^3$.

Step 4 — Evaluate: $\log_{10} 10^3 = 3$.

Common errors: Multiplying the logarithms instead of adding, or stopping at $\log_{10} 1000$ without simplifying to 3.

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

Answer: (3) Go Back to Q 14

Q15.

Solution

Concept — Sum of an arithmetic progression: $S_n = \frac{n}{2}\left[2a + (n-1)d\right]$, where a is the first term and d the common difference.

Step 1 — Substitute the known values: With $a = 4$, $d = 4$: $S_n = \frac{n}{2}\left[2(4) + (n-1)4\right]$.

Step 2 — Simplify the bracket: $2(4) + (n-1)4 = 8 + 4n - 4 = 4n + 4$.

Step 3 — Write the sum: $S_n = \frac{n}{2}(4n + 4) = 2n(n+1)$.

Step 4 — Set equal to 312: $2n(n+1) = 312 \Rightarrow n(n+1) = 156$.

Step 5 — Solve by factor pairing: $156 = 12 \times 13$, so $n = 12$ (since n and $n+1$ are consecutive).

Why other options are wrong:

- $10, 13, 14$: do not satisfy $n(n+1) = 156$.

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

Answer: (B) Go Back to Q 15

Q16.

Solution

Concept — Heron's formula: For a triangle with sides a, b, c and semi-perimeter $s = \frac{a+b+c}{2}$, the area is $\sqrt{s(s-a)(s-b)(s-c)}$.

Step 1 — Find the semi-perimeter: $s = \frac{13+14+15}{2} = \frac{42}{2} = 21$.

Step 2 — Compute the differences: $s - a = 21 - 13 = 8$, $s - b = 21 - 14 = 7$, $s - c = 21 - 15 = 6$.

Step 3 — Substitute into the formula: Area $= \sqrt{21 \times 8 \times 7 \times 6}$.

Step 4 — Multiply under the root: $21 \times 8 = 168$; $168 \times 7 = 1176$; $1176 \times 6 = 7056$.

Step 5 — Take the square root: $\sqrt{7056} = 84$.

Why other options are wrong:

- $90, 80, 78$: do not equal $\sqrt{7056}$; they come from arithmetic slips under the root.

Final Answer: 84 square cm $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 16

Q17.

Solution

Concept — Inscribed angle theorem: An inscribed angle is half the central angle that subtends the same arc.

Step 1 — Identify the two angles: The central angle $\angle AOB = 110°$ and the inscribed angle $\angle ACB$ both stand on arc AB.

Step 2 — Apply the theorem: $\angle ACB = \frac{1}{2}\angle AOB$.

Step 3 — Substitute: $\angle ACB = \frac{1}{2} \times 110°$.

Step 4 — Simplify: $\frac{110^\circ}{2} = 55^\circ$.

Why other options are wrong:

- 70°: uses $180^\circ - 110^\circ$, which is unrelated here.
- $50^\circ, 60^\circ$: do not equal half of 110°.

Final Answer: $55^\circ \Rightarrow \boxed{\text{B}}$

Answer: (B) Go Back to Q 17

Q18.

Solution

Concept — Distance formula: The distance between (x_1, y_1) and (x_2, y_2) is $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$.

Step 1 — Find the horizontal gap: $x_2 - x_1 = 15 - 3 = 12$.

Step 2 — Find the vertical gap: $y_2 - y_1 = 13 - 4 = 9$.

Step 3 — Square and add: $12^2 + 9^2 = 144 + 81 = 225$.

Step 4 — Take the square root: $\sqrt{225} = 15$.

Common errors: Adding the coordinates before squaring, or forgetting the square root at the end.

Final Answer: 15 units $\Rightarrow \boxed{15}$

Answer: (15) Go Back to Q 18

Q19.

Solution

Concept — Total surface area of a solid hemisphere: It is the curved surface plus the flat circular base: $2\pi r^2 + \pi r^2 = 3\pi r^2$.

Step 1 — Write the formula: TSA $= 3\pi r^2$.

Step 2 — Substitute $r = 7$ and $\pi = \frac{22}{7}$: TSA $= 3 \times \frac{22}{7} \times 7^2$.

Step 3 — Simplify r^2 with the denominator: $\frac{22}{7} \times 49 = 22 \times 7 = 154$.

Step 4 — Multiply by 3: $3 \times 154 = 462$ square cm.

Why other options are wrong:

- 308: only the curved surface $2\pi r^2$, missing the flat base.
- 154: only the flat base πr^2.
- 616: the full sphere's surface $4\pi r^2$, not a hemisphere.

Final Answer: 462 square cm $\Rightarrow \boxed{\text{C}}$

Answer: (C) Go Back to Q 19

Q20.

Solution

Concept — Trailing zeros from factors of 5: A trailing zero comes from a factor $10 = 2 \times 5$. Since factors of 2 are plentiful, the count of trailing zeros equals the number of factors of 5 in $n!$, given by $\left\lfloor \frac{n}{5} \right\rfloor + \left\lfloor \frac{n}{25} \right\rfloor + \left\lfloor \frac{n}{125} \right\rfloor + \cdots$

Step 1 — Count multiples of 5: $\left\lfloor \frac{80}{5} \right\rfloor = 16$.

Step 2 — Count multiples of 25: $\left\lfloor \frac{80}{25} \right\rfloor = 3$.

Step 3 — Count multiples of 125: $\left\lfloor \frac{80}{125} \right\rfloor = 0$, so we stop here.

Step 4 — Add the counts: $16 + 3 + 0 = 19$.

Common errors: Stopping at $\lfloor 80/5 \rfloor = 16$ and forgetting the extra factor of 5 inside each multiple of 25.

Final Answer: 19 trailing zeros $\Rightarrow \boxed{19}$

Answer: (19) Go Back to Q 20

Q21.

Solution

Concept — Counting divisors: If $N = p^a q^b \cdots$, the number of positive divisors is $(a+1)(b+1)\cdots$

Step 1 — Prime factorise 432: $432 = 16 \times 27 = 2^4 \times 3^3$.

Step 2 — Add one to each exponent: Exponents 4 and 3 give $(4+1)$ and $(3+1)$, i.e. 5 and 4.

Step 3 — Multiply: $5 \times 4 = 20$.

Why other options are wrong:

- $18, 24, 16$: come from a wrong factorisation or from multiplying the exponents without adding one.

Final Answer: 20 factors $\Rightarrow \boxed{\text{D}}$

Answer: (D) Go Back to Q 21

Q22.

Solution

Concept — Triangles from points: A triangle is fixed by choosing 3 of the points. With no three collinear, every choice of 3 points gives a genuine triangle, so the count is $\binom{n}{3}$.

Step 1 — Identify n: There are $n = 8$ points.

Step 2 — Write the combination: Number of triangles $= \binom{8}{3}$.

Step 3 — Expand: $\binom{8}{3} = \dfrac{8 \times 7 \times 6}{3 \times 2 \times 1}$.

Step 4 — Simplify: $\dfrac{336}{6} = 56$.

Common errors: Using permutations $\dfrac{8!}{5!} = 336$ (which counts ordered triples), or forgetting to divide by $3!$.

Final Answer: 56 triangles $\Rightarrow \boxed{56}$

Answer: (56) Go Back to Q 22

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	2	A	3	120	4	D	5	C
6	24	7	A	8	50	9	B	10	A
11	16	12	A	13	C	14	3	15	B
16	D	17	B	18	15	19	C	20	19
21	D	22	56						