School Connect Online

SCO INTERNATIONAL

MATHS OLYMPIAD

CLASS 9 OFFICIAL QUESTION PAPER

Officially formatted official question paper for Grade 9 learners, with answer key and explanations

Designed from Class 9 syllabus pathways and aligned with SCO's platform flow for guided preparation, practice, reporting, and future-ready academic growth.

- age-fit learning guidance for Grade 9 learners globally
- chapter-wise pathways across number systems, algebra, geometry, mensuration, statistics and probability
- Olympiad-oriented reasoning, accuracy, explanation and academic enrichment

Number System	Polynomials	Coordinate Geometry	Euclid Geometry	Mensuration
Statistics	Probability	Triangles	Circles	Constructions

SCO INTERNATIONAL MATHS OLYMPIAD 2025-26

QUESTION PAPER SET H | Total Questions: 50 | Time: 1 hour

Name	.....
Registration ID	.....
Contact No.	.....

Guidelines for the Candidate

1. Before the exam begins, students may use the additional time given by the invigilator to complete OMR/personal details.
2. The paper has four parts: General Questions, Case/Skill Questions, Reason & Assertion, and Achievers Section.
3. Each question has exactly one correct answer. Calculator use is not allowed unless explicitly permitted by the exam centre.
4. Use only HB pencil or blue/black ballpoint pen to mark the answer on the OMR sheet.
5. Read diagrams, tables, and given data carefully. All passages and figures are part of the question block.
6. At the end of the test, hand over the answer sheet/booklet as instructed by the invigilator.

General Questions

Q1. Which statement correctly describes the decimal expansion of an irrational number such as √2?

A. It terminates after a fixed number of digits.	**B.** It is non-terminating and non-repeating.
C. It is always a whole number.	**D.** It can be written as p/q for integers p and q, q ≠ 0.

Answer: B

Explanation: An irrational number cannot be expressed as a ratio of two integers. Its decimal expansion is non-terminating and non-repeating.

Q2. Simplify: √50 - 2√8 + √18.

A. 2√2	**B.** 3√2
C. 4√2	**D.** 5√2

Answer: C

Explanation: √50 = 5√2, 2√8 = 4√2, and √18 = 3√2. So 5√2 - 4√2 + 3√2 = 4√2.

Q3. Rationalise the denominator of 1/(5 + √3).

A. (5 - √3)/22	**B.** (5 + √3)/22
C. (5 - √3)/28	**D.** (5 + √3)/28

Answer: A

Explanation: Multiply numerator and denominator by (5 - √3). Denominator = 25 - 3 = 22, so the result is (5 - √3)/22.

Q4. For the polynomial $p(x) = x^2 - 5x + 6$, which value of x is NOT a zero?

A. 2	**B.** 3
C. 4	**D.** Both 2 and 3

Answer: C

Explanation: p(x) = (x - 2)(x - 3), so the zeroes are 2 and 3. Therefore 4 is not a zero.

Q5. If $p(x) = x^3 - 4x^2 + x + 6$, what is p(2)?

A. 0	**B.** 2
C. -2	**D.** 6

Answer: A

Explanation: p(2) = 8 - 16 + 2 + 6 = 0. Hence x = 2 is a zero of p(x).

Q6. Which factor is common to $x^2 - 9$ and $x^2 - 6x + 9$?

A. x + 3	**B.** x - 3
C. x + 9	**D.** x - 9

Answer: B

Explanation: $x^2 - 9 = (x - 3)(x + 3)$, and $x^2 - 6x + 9 = (x - 3)^2$. The common factor is x - 3.

Q7. The point P(-3, 4) lies in which quadrant of the Cartesian plane?

A. First quadrant	**B.** Second quadrant
C. Third quadrant	**D.** Fourth quadrant

Answer: B

Explanation: A point with negative x-coordinate and positive y-coordinate lies in the second quadrant.

Q8. Which equation represents a line parallel to the y-axis and passing through (5, -2)?

A. x = 5	**B.** y = 5
C. x + y = 5	**D.** y = -2

Answer: A

Explanation: A vertical line parallel to the y-axis has equation x = constant. Since it passes through (5, -2), the equation is x = 5.

Q9. A point is 4 units to the left of the y-axis and 3 units above the x-axis. What are its coordinates?

A. (4, 3)	**B.** (-4, 3)
C. (3, -4)	**D.** (-3, 4)

Answer: B

Explanation: Left of the y-axis means the x-coordinate is negative, and above the x-axis means the y-coordinate is positive. So the point is (-4, 3).

Q10. If (2, 1) is a solution of ax + y = 7, what is the value of a?

A. 2	**B.** 3
C. 4	**D.** 5

Answer: B

Explanation: Substitute x = 2 and y = 1: 2a + 1 = 7, so 2a = 6 and a = 3.

Q11. Which statement is an example of Euclid's axiom "things equal to the same thing are equal to one another"?

A. If a = b and b = c, then a = c.	**B.** A line has no breadth.
C. A circle has one centre.	**D.** A point has no part.

Answer: A

Explanation: The axiom means that if two quantities are separately equal to the same quantity, they are equal to each other.

Q12. Two straight lines intersect. If one angle is 110°, what is the measure of each adjacent angle?

A. 55°	**B.** 70°
C. 90°	**D.** 110°

Answer: B

Explanation: Adjacent angles on a straight line are supplementary. Therefore the adjacent angle is 180° - 110° = 70°.

Q13. In a triangle, two angles are 47° and 63°. What is the third angle?

A. 60°	**B.** 70°
C. 80°	**D.** 90°

Answer: B

Explanation: Sum of angles in a triangle is 180°. Third angle = 180° - (47° + 63°) = 70°.

Q14. Which set of lengths cannot form a triangle?

A. 5 cm, 6 cm, 7 cm	**B.** 4 cm, 8 cm, 12 cm
C. 6 cm, 8 cm, 10 cm	**D.** 7 cm, 9 cm, 11 cm

Answer: B

Explanation: For a triangle, the sum of any two sides must be greater than the third side. Here 4 + 8 = 12, so a triangle cannot be formed.

Q15. Which congruence criterion is used when two sides and the included angle of one triangle are equal to two sides and the included angle of another triangle?

A. SSS	**B.** SAS
C. ASA	**D.** RHS

Answer: B

Explanation: Two sides and the included angle correspond to the SAS congruence criterion.

Q16. In a parallelogram, one angle is 65°. What is the adjacent angle?

A. 65°	**B.** 95°
C. 105°	**D.** 115°

Answer: D

Explanation: Adjacent angles of a parallelogram are supplementary. Therefore the adjacent angle is 180° - 65° = 115°.

Q17. The line segment joining the midpoints of two sides of a triangle is:

A. perpendicular to the third side	**B.** parallel to the third side
C. equal to the third side	**D.** always a median

Answer: B

Explanation: By the midpoint theorem, the segment joining midpoints of two sides of a triangle is parallel to the third side and half of it.

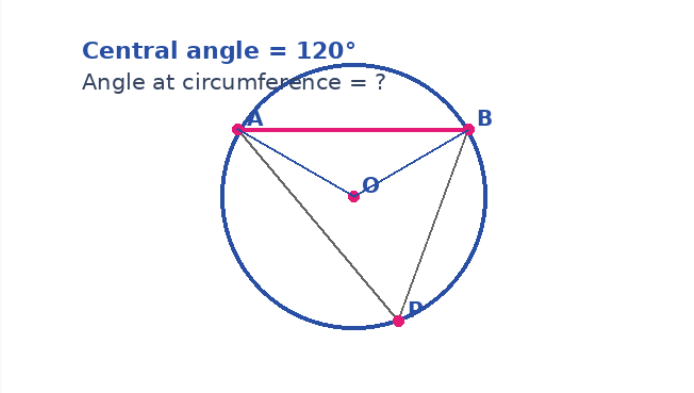
Q18. A parallelogram has base 12 cm and height 7 cm. Find its area.

A. 19 cm^2	**B.** 42 cm^2
C. 84 cm^2	**D.** 96 cm^2

Answer: C

Explanation: Area of a parallelogram = base × height = 12 × 7 = 84 cm^2.

Q19. In a circle, a chord subtends 120° at the centre. What angle does it subtend at a point on the remaining circumference?



A. 30°	**B.** 45°
C. 60°	**D.** 120°

Answer: C

Explanation: The angle at the centre is twice the angle at the circumference standing on the same chord. Hence the required angle is 120°/2 = 60°.

Q20. Which construction is best for locating points that are exactly the same distance from A and B?

A. Draw any arc from A only.	**B.** Construct the perpendicular bisector of AB.
C. Draw a circle with centre A only.	**D.** Draw a line through A parallel to AB.

Answer: B

Explanation: Every point on the perpendicular bisector of a segment is equidistant from the endpoints of the segment.

Case / Skill-based Questions

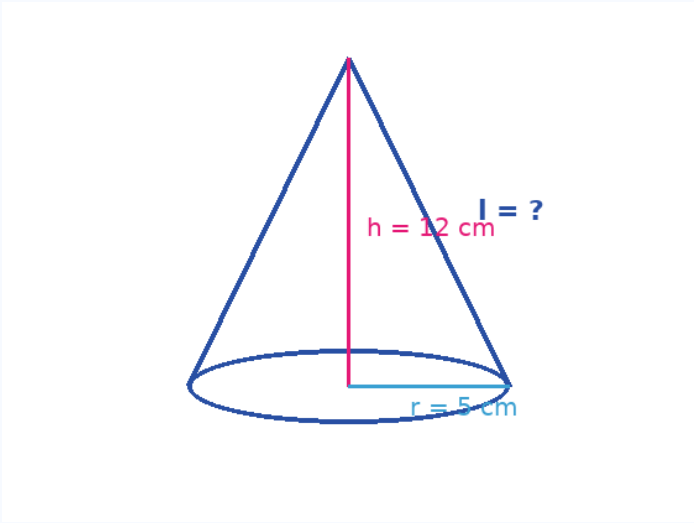
Q21. Using Heron's formula, the area of a triangle with sides 13 cm, 14 cm and 15 cm is:

A. 78 cm^2	**B.** 84 cm^2
C. 90 cm^2	**D.** 96 cm^2

Answer: B

Explanation: $s = (13 + 14 + 15)/2 = 21$. Area $= \sqrt{[21(8)(7)(6)]} = \sqrt{7056} = 84\ cm^2$.

Q22. A cone has radius 5 cm and height 12 cm. What is its slant height?



A. 11 cm	**B.** 12 cm
C. 13 cm	**D.** 17 cm

Answer: C

Explanation: Slant height $l = \sqrt{(r^2 + h^2)} = \sqrt{(5^2 + 12^2)} = \sqrt{169} = 13$ cm.

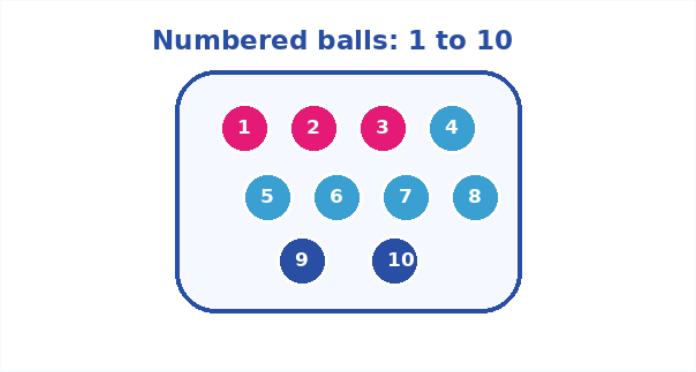
Q23. The mean of five observations 6, 8, 10, 14 and 17 is:

A. 10	**B.** 11
C. 12	**D.** 13

Answer: B

Explanation: Mean $= (6 + 8 + 10 + 14 + 17)/5 = 55/5 = 11$.

Q24. **A bag has balls numbered 1 to 10. What is the probability of drawing a number that is a multiple of 3?**

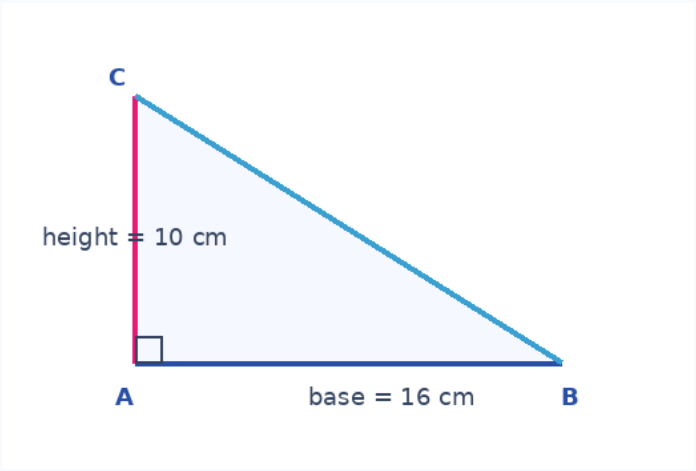


A. 1/5	**B.** 3/10
C. 2/5	**D.** 1/2

Answer: B

Explanation: Multiples of 3 from 1 to 10 are 3, 6 and 9. Favourable outcomes = 3, total outcomes = 10, so probability = 3/10.

Q25. **For the triangle shown with base 16 cm and height 10 cm, find its area.**



A. 40 cm^2	**B.** 60 cm^2
C. 80 cm^2	**D.** 160 cm^2

Answer: C

Explanation: Area of a triangle = 1/2 × base × height = 1/2 × 16 × 10 = 80 cm^2.

Q26. **A cube has side 6 cm. What is its total surface area?**

A. 36 cm^2	**B.** 72 cm^2

C. 180 cm^2	**D.** 216 cm^2

Answer: D

Explanation: Total surface area of a cube = $6a^2 = 6 \times 6^2 = 216\ cm^2$.

Q27. Which is the correct factorisation of $x^2 + 7x + 12$?

A. (x + 3)(x + 4)	**B.** (x - 3)(x - 4)
C. (x + 2)(x + 6)	**D.** (x - 2)(x - 6)

Answer: A

Explanation: The two numbers with product 12 and sum 7 are 3 and 4. Therefore $x^2 + 7x + 12 = (x + 3)(x + 4)$.

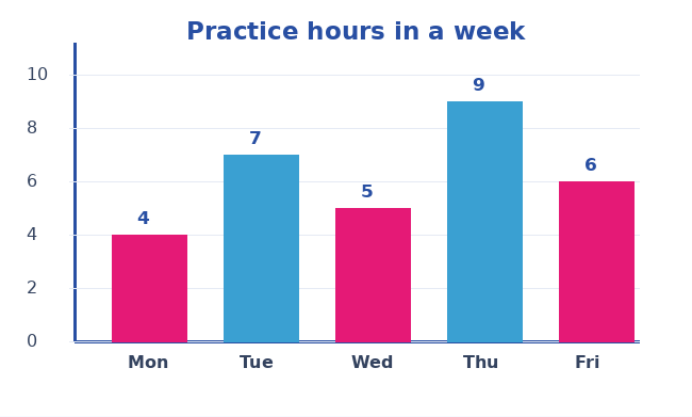
Q28. The graph of x + y = 6 cuts the x-axis at:

A. (0, 6)	**B.** (6, 0)
C. (3, 3)	**D.** (-6, 0)

Answer: B

Explanation: On the x-axis, y = 0. So x + 0 = 6 and x = 6. The intercept is (6, 0).

Q29. In the bar graph shown, on which day were the maximum practice hours recorded?

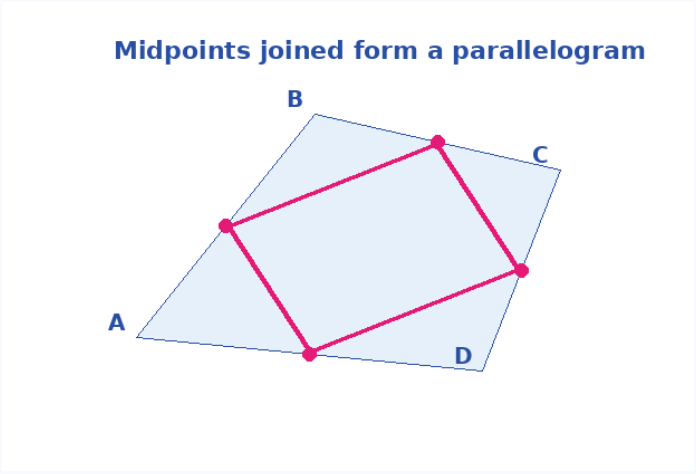


A. Monday	**B.** Tuesday
C. Thursday	**D.** Friday

Answer: C

Explanation: The tallest bar is for Thursday, with 9 hours.

Q30. If a quadrilateral is formed by joining the midpoints of any quadrilateral, the new quadrilateral is always a:



A. square	**B.** rectangle
C. parallelogram	**D.** rhombus

Answer: C

Explanation: By Varignon's theorem, joining the midpoints of any quadrilateral forms a parallelogram.

Reason and Assertion

Q31. Assertion (A): Every terminating decimal is a rational number. Reason (R): A terminating decimal can be written with a denominator that is a power of 10.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: A decimal such as 0.375 = 375/1000, so it is rational. The reason correctly explains the assertion.

Q32. Assertion (A): If p(3) = 0 for a polynomial p(x), then x - 3 is a factor of p(x). Reason (R): The factor theorem connects zeroes of a polynomial with its linear factors.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: The factor theorem states that if p(a) = 0, then x - a is a factor. Here a = 3.

Q33. Assertion (A): The point (0, -5) lies on the y-axis. Reason (R): Every point on the y-axis has x-coordinate 0.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: A point lies on the y-axis exactly when its x-coordinate is 0.

Q34. Assertion (A): Two lines parallel to the same line are parallel to each other. Reason (R): This follows from Euclid's parallel postulate and angle properties of parallel lines.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: If two lines maintain the same direction as a third line, they do not meet and are parallel to each other.

Q35. Assertion (A): In a parallelogram, opposite sides are equal. Reason (R): A diagonal of a parallelogram divides it into two congruent triangles.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: The diagonal creates two triangles that can be proved congruent, giving equality of opposite sides.

Q36. Assertion (A): An angle in a semicircle is a right angle. Reason (R): The angle subtended by a diameter at the circumference is 90°.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: The reason is the theorem that directly explains the assertion.

Q37. Assertion (A): The total surface area of a sphere of radius r is $4\pi r^2$. Reason (R): The curved surface area of a cylinder is $2\pi rh$.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: B

Explanation: Both formulas are true, but the cylinder formula does not explain the sphere formula.

Q38. Assertion (A): The median of 2, 5, 8, 11, 14 is 8. Reason (R): For an odd number of observations arranged in order, the middle observation is the median.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: There are five ordered observations, and the middle one is the third value, 8.

Q39. Assertion (A): The probability of an impossible event is 1. Reason (R): Probability values always lie between 0 and 1.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: D

Explanation: An impossible event has probability 0, not 1. The reason is true.

Q40. Assertion (A): If the base and height of a triangle are doubled, its area becomes four times. Reason (R): Area of a triangle is 1/2 × base × height.

A. Both A and R are true, and R explains A.	**B.** Both A and R are true, but R does not explain A.
C. A is true, R is false.	**D.** A is false, R is true.

Answer: A

Explanation: Doubling both base and height multiplies the area by 2 × 2 = 4, as shown by the area formula.

Achievers Section

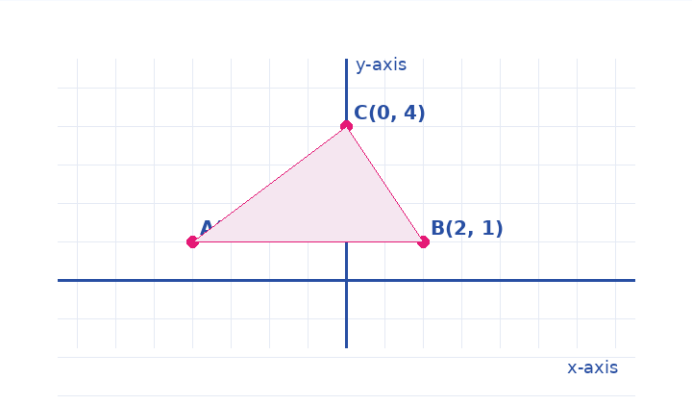
Q41. If α and β are zeroes of $x^2 - 9x + 20$, find $\alpha^2 + \beta^2$.

A. 31	**B.** 41
C. 51	**D.** 61

Answer: B

Explanation: $\alpha + \beta = 9$ and $\alpha\beta = 20$. $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta = 81 - 40 = 41$.

Q42. A triangle has coordinates A(-4, 1), B(2, 1) and C(0, 4). What is its area?



A. 6 sq. units	**B.** 9 sq. units
C. 12 sq. units	**D.** 18 sq. units

Answer: B

Explanation: Base AB = 6 units and height from C to AB is 3 units. Area = 1/2 × 6 × 3 = 9 sq. units.

Q43. The sides of a triangle are 10 cm, 17 cm and 21 cm. Find its area using Heron's formula.

A. 42 cm^2	**B.** 63 cm^2
C. 84 cm^2	**D.** 105 cm^2

Answer: C

Explanation: s = (10 + 17 + 21)/2 = 24. Area = $\sqrt{[24 \times 14 \times 7 \times 3]} = \sqrt{7056} = 84\ cm^2$.

Q44. **A cylinder of radius 7 cm and height 10 cm has volume:**

A. 220 cm^3	**B.** 770 cm^3
C. 1540 cm^3	**D.** 3080 cm^3

Answer: C

Explanation: Volume = $\pi r^2 h$ = (22/7) × 7 × 7 × 10 = 1540 cm^3.

Q45. **The mean of 8 observations is 15. If one observation 27 is removed, what is the mean of the remaining observations?**

A. 12	**B.** 13
C. 93/7	**D.** 15

Answer: C

Explanation: Total = 8 × 15 = 120. New total = 120 - 27 = 93. New mean = 93/7.

Q46. **Two coins are tossed together. What is the probability of getting exactly one head?**

A. 1/4	**B.** 1/2
C. 3/4	**D.** 1

Answer: B

Explanation: Sample space: HH, HT, TH, TT. Exactly one head occurs in HT and TH. Probability = 2/4 = 1/2.

Q47. **If the graph of 2x + 3y = 12 cuts the y-axis at (0, k), find k.**

A. 2	**B.** 3
C. 4	**D.** 6

Answer: C

Explanation: On the y-axis, x = 0. Then 3y = 12, so y = 4. Hence k = 4.

Q48. **A cyclic quadrilateral has three angles 80°, 95° and 100°. What is the fourth angle?**

A. 75°	**B.** 85°
C. 95°	**D.** 105°

Answer: B

Explanation: The sum of angles of any quadrilateral is 360°. Fourth angle = 360° - (80° + 95° + 100°) = 85°.

Q49. A cone has radius 3 cm and slant height 5 cm. Its total surface area is:

A. 15π cm^2	**B.** 24π cm^2
C. 30π cm^2	**D.** 45π cm^2

Answer: B

Explanation: Total surface area of a cone = $\pi r(l + r) = \pi \times 3 \times (5 + 3) = 24\pi$ cm^2.

Q50. From the numbers 1 to 30, what is the probability of selecting a number divisible by 4 or 6?

A. 1/5	**B.** 1/3
C. 2/5	**D.** 7/15

Answer: B

Explanation: Multiples of 4: 7 numbers. Multiples of 6: 5 numbers. Multiples of 12 counted twice: 2 numbers. Favourable = 7 + 5 - 2 = 10. Probability = 10/30 = 1/3.

Answer Key

1	2	3	4	5	6	7	8	9	10
B	C	A	C	A	B	B	A	B	B
A	B	B	B	B	D	B	C	C	B
B	C	B	B	C	D	A	B	C	C
A	A	A	A	A	A	B	A	D	A
B	B	C	C	C	B	C	B	B	B

Detailed answer explanations are provided inside each question block for transparent review and self-learning.