School Connect Online

SCO INTERNATIONAL

MATHS OLYMPIAD

CLASS 9 SAMPLE PAPER

Officially formatted sample 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 SAMPLE PAPER

QUESTION PAPER SET S | 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 of these numbers is irrational?**

A. 0.75	**B.** -3/5
C. $\sqrt{7}$	**D.** 1.2

Answer: C

Explanation: $\sqrt{7}$ is irrational because 7 is not a perfect square and $\sqrt{7}$ cannot be written as a ratio of integers.

Q2. **Simplify: $3\sqrt{12} - \sqrt{27} + 2\sqrt{3}$.**

A. $5\sqrt{3}$	**B.** $7\sqrt{3}$
C. $9\sqrt{3}$	**D.** $11\sqrt{3}$

Answer: A

Explanation: $3\sqrt{12} = 3 \times 2\sqrt{3} = 6\sqrt{3}$, $\sqrt{27} = 3\sqrt{3}$, so $6\sqrt{3} - 3\sqrt{3} + 2\sqrt{3} = 5\sqrt{3}$.

Q3. **Rationalise $1/(\sqrt{5} - 2)$.**

A. $\sqrt{5} + 2$	**B.** $\sqrt{5} - 2$
C. $(\sqrt{5} + 2)/9$	**D.** $1/(\sqrt{5} + 2)$

Answer: A

Explanation: Multiply by $(\sqrt{5} + 2)$. Denominator = 5 - 4 = 1. Result = $\sqrt{5} + 2$.

Q4. **If $p(x) = x^2 - 4x - 5$, which is a zero of $p(x)$?**

A. -1	**B.** 0
C. 4	**D.** 6

Answer: A

Explanation: $p(x) = (x - 5)(x + 1)$, so -1 and 5 are zeroes. Among the options, -1 is correct.

Q5. **Find $p(-2)$ for $p(x) = 2x^2 + 3x - 4$.**

A. -2	**B.** 0
C. -6	**D.** -8

Answer: A

Explanation: p(-2) = 2(4) + 3(-2) - 4 = 8 - 6 - 4 = -2.

Q6. Factorise: $x^2 - 11x + 30$.

A. (x - 5)(x - 6)	**B.** (x + 5)(x + 6)
C. (x - 3)(x - 10)	**D.** (x + 3)(x + 10)

Answer: A

Explanation: The two numbers with product 30 and sum 11 are 5 and 6. Hence $x^2 - 11x + 30 = (x - 5)(x - 6)$.

Q7. The point Q(4, -7) lies in which quadrant?

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

Answer: D

Explanation: x is positive and y is negative, so the point lies in the fourth quadrant.

Q8. Which point lies on the x-axis?

A. (0, 5)	**B.** (5, 0)
C. (3, 4)	**D.** (-2, 7)

Answer: B

Explanation: A point on the x-axis has y-coordinate 0. Therefore (5, 0) lies on the x-axis.

Q9. A line passes through (0, 3) and is parallel to the x-axis. Its equation is:

A. x = 3	**B.** y = 3
C. x + y = 3	**D.** y = x + 3

Answer: B

Explanation: A line parallel to the x-axis has equation y = constant. Since it passes through (0, 3), y = 3.

Q10. If x - 2y = 1 and x = 7, find y.

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

Answer: B

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

Q11. Which Euclidean idea is used when we say "a straight line can be drawn joining any two points"?

A. Postulate	**B.** Median
C. Polynomial	**D.** Histogram

Answer: A

Explanation: This is a form of Euclid's postulate about drawing a straight line between any two points.

Q12. If two parallel lines are cut by a transversal and one corresponding angle is 68°, the matching corresponding angle is:

A. 68°	**B.** 112°
C. 90°	**D.** 34°

Answer: A

Explanation: Corresponding angles formed by a transversal with parallel lines are equal.

Q13. The exterior angle of a triangle is 125°. One remote interior angle is 55°. Find the other remote interior angle.

A. 60°	**B.** 70°
C. 80°	**D.** 90°

Answer: B

Explanation: Exterior angle equals the sum of the two remote interior angles. Other angle = 125° - 55° = 70°.

Q14. Which sides can form a triangle?

A. 2 cm, 3 cm, 7 cm	**B.** 5 cm, 9 cm, 14 cm
C. 6 cm, 7 cm, 10 cm	**D.** 4 cm, 4 cm, 9 cm

Answer: C

Explanation: For 6, 7, 10, the sum of any two sides is greater than the third side. The other options fail the triangle inequality.

Q15. The RHS congruence rule applies to:

A. two acute triangles only	**B.** two right triangles
C. any two quadrilaterals	**D.** two circles

Answer: B

Explanation: RHS stands for Right angle-Hypotenuse-Side and applies to right triangles.

Q16. A parallelogram has adjacent sides 8 cm and 5 cm. Its perimeter is:

A. 13 cm	**B.** 26 cm
C. 40 cm	**D.** 80 cm

Answer: B

Explanation: Perimeter of a parallelogram = $2(a + b) = 2(8 + 5) = 26$ cm.

Q17. In a triangle, the segment joining midpoints of two sides is 9 cm. What is the length of the third side?

A. 9 cm	**B.** 12 cm
C. 18 cm	**D.** 27 cm

Answer: C

Explanation: By the midpoint theorem, the segment is half the third side. So the third side is 18 cm.

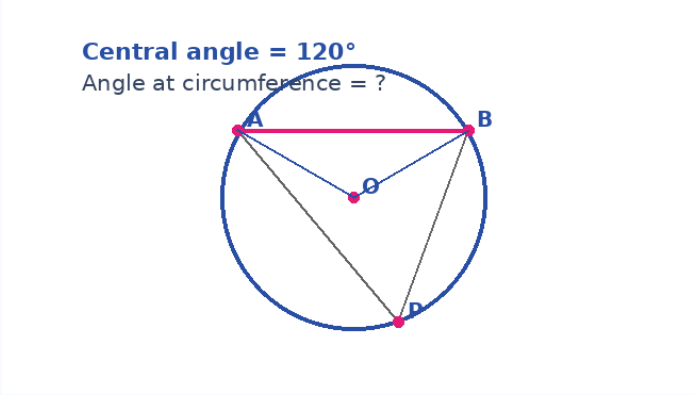
Q18. Find the area of a triangle with base 15 cm and height 8 cm.

A. 60 cm^2	**B.** 80 cm^2
C. 100 cm^2	**D.** 120 cm^2

Answer: A

Explanation: Area = 1/2 × base × height = 1/2 × 15 × 8 = 60 cm^2.

Q19. A chord subtends 80° at the centre of a circle. What angle does it subtend at the circumference on the same arc?



A. 20°	**B.** 40°
C. 80°	**D.** 160°

Answer: B

Explanation: The angle at the circumference is half the angle at the centre, so it is 40°.

Q20. Which tool pair is essential for standard geometrical construction?

A. Compass and straightedge	**B.** Calculator and protractor only
C. Scale and weighing balance	**D.** Bar graph and histogram

Answer: A

Explanation: Traditional constructions are made using a compass and a straightedge.

Case / Skill-based Questions

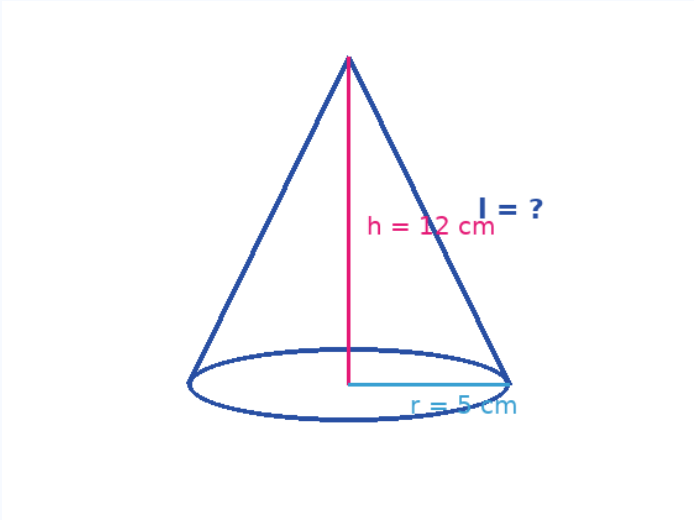
Q21. Find the area of a triangle with sides 9 cm, 10 cm and 17 cm.

A. 24 cm^2	**B.** 36 cm^2
C. 48 cm^2	**D.** 54 cm^2

Answer: B

Explanation: s = 18. Area = $\sqrt{[18 \times 9 \times 8 \times 1]} = \sqrt{1296} = 36$ cm^2.

Q22. A cone has radius 6 cm and height 8 cm. Find its slant height.



A. 8 cm	**B.** 10 cm
C. 12 cm	**D.** 14 cm

Answer: B

Explanation: l = $\sqrt{(6^2 + 8^2)} = \sqrt{100} = 10$ cm.

Q23. The mean of 12, 15, 17, 20 and 21 is:

A. 15	**B.** 16
C. 17	**D.** 18

Answer: C

Explanation: Mean = (12 + 15 + 17 + 20 + 21)/5 = 85/5 = 17.

Q24. A die is rolled once. What is the probability of getting an even number?

A. 1/6	**B.** 1/3
C. 1/2	**D.** 2/3

Answer: C

Explanation: Even outcomes are 2, 4 and 6. Probability = 3/6 = 1/2.

Q25. A rectangle is 18 cm long and 7 cm wide. Find its area.

A. 25 cm^2	**B.** 63 cm^2
C. 126 cm^2	**D.** 252 cm^2

Answer: C

Explanation: Area of rectangle = length × width = 18 × 7 = 126 cm^2.

Q26. The volume of a cube of side 5 cm is:

A. 25 cm^3	**B.** 75 cm^3
C. 100 cm^3	**D.** 125 cm^3

Answer: D

Explanation: Volume of a cube = $a^3 = 5^3$ = 125 cm^3.

Q27. The value of (x + 2)(x - 2) is:

A. $x^2 + 4$	**B.** $x^2 - 4$
C. $x^2 - 2$	**D.** $x^2 + 2$

Answer: B

Explanation: This is the identity $(a + b)(a - b) = a^2 - b^2$, so $(x + 2)(x - 2) = x^2 - 4$.

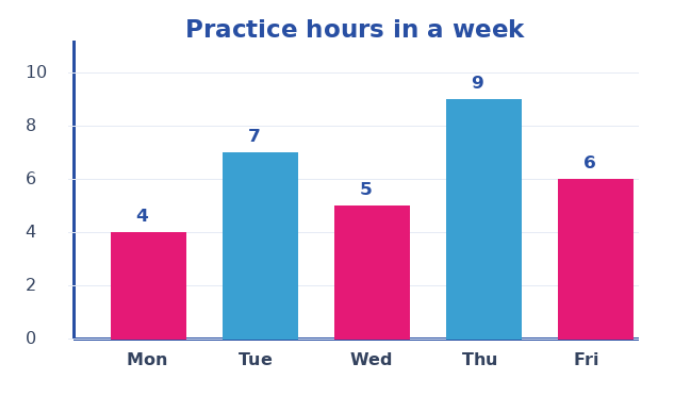
Q28. The graph of 3x - y = 6 cuts the y-axis at:

A. (0, -6)	**B.** (0, 6)
C. (2, 0)	**D.** (-2, 0)

Answer: A

Explanation: On the y-axis, x = 0. Then -y = 6, so y = -6. Point is (0, -6).

Q29. Using the bar graph shown, what is the difference between Thursday and Monday practice hours?

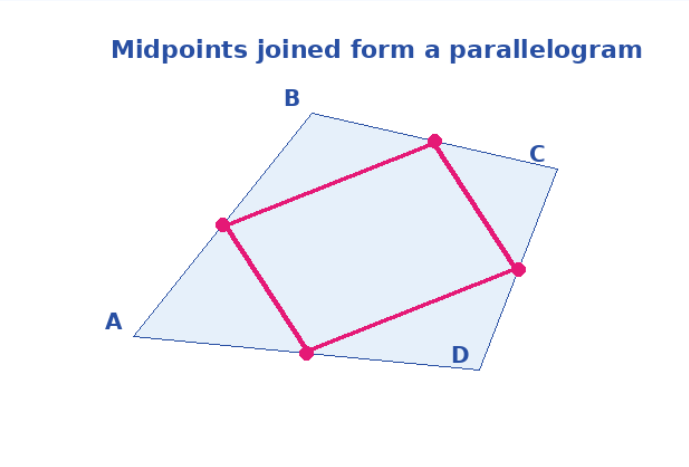


A. 3 hours	**B.** 4 hours
C. 5 hours	**D.** 6 hours

Answer: C

Explanation: Thursday has 9 hours and Monday has 4 hours. Difference = 5 hours.

Q30. In the figure formed by joining midpoints of a quadrilateral, the inner quadrilateral is a parallelogram. This result is known as:



A. Pythagoras theorem	**B.** Varignon theorem
C. Remainder theorem	**D.** Factor theorem

Answer: B

Explanation: The midpoint quadrilateral theorem is also called Varignon's theorem.

Reason and Assertion

Q31. Assertion (A): √5 is irrational. Reason (R): 5 is not a perfect square.

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 square root of a non-perfect-square natural number is irrational.

Q32. Assertion (A): If p(-1) = 0, then x + 1 is a factor of p(x). Reason (R): If p(a) = 0, then x - a is a factor.

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: Here a = -1, so x - a = x + 1.

Q33. Assertion (A): A point on the x-axis has y-coordinate zero. Reason (R): The x-axis is the horizontal axis.

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: Every point on the x-axis is of the form (x, 0).

Q34. Assertion (A): Vertically opposite angles are equal. Reason (R): They are formed when two lines intersect.

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 are true, but simply being formed by intersecting lines does not fully explain equality; equality follows from linear pair relationships.

Q35. Assertion (A): The diagonals of a parallelogram bisect each other. Reason (R): Opposite sides of a parallelogram are parallel.

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: Using parallel sides and alternate interior angles, the triangles formed by diagonals can be proved congruent, so diagonals bisect each other.

Q36. Assertion (A): Equal chords of a circle subtend equal angles at the centre. Reason (R): Equal chords are equidistant from the centre.

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 statements are true, but the equality of central angles is usually proved using congruent radii and chord lengths.

Q37. Assertion (A): The volume of a cylinder is $\pi r^2 h$. Reason (R): A cylinder can be understood as a stack of congruent circular disks.

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 volume equals base area × height. The base area is πr^2, so volume is $\pi r^2 h$.

Q38. Assertion (A): The mode is the observation that occurs most often. Reason (R): The median is the sum of all observations divided by their number.

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: C

Explanation: The assertion is true. The reason is false because it defines mean, not median.

Q39. Assertion (A): Probability of a sure event is 1. Reason (R): A sure event includes all possible outcomes.

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 every possible outcome is favourable, probability = total favourable outcomes/total outcomes = 1.

Q40. Assertion (A): Heron's formula can be used when three sides of a triangle are known. Reason (R): It uses semi-perimeter and side lengths to compute area.

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: Heron's formula is Area = $\sqrt{[s(s-a)(s-b)(s-c)]}$, so the three sides are sufficient.

Achievers Section

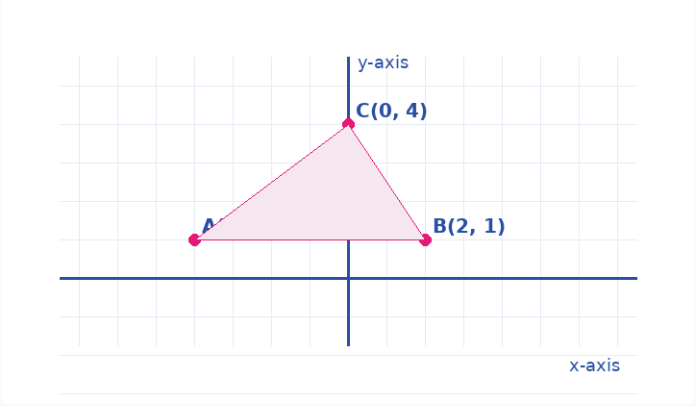
Q41. If α and β are zeroes of $x^2 - 7x + 10$, find $\alpha^2 + \beta^2$.

A. 19	**B.** 29
C. 39	**D.** 49

Answer: B

Explanation: $\alpha + \beta = 7$ and $\alpha\beta = 10$. $\alpha^2 + \beta^2 = 49 - 20 = 29$.

Q42. Find the area of the triangle with vertices A(-2, 2), B(4, 2), C(1, 6).



A. 8 sq. units	**B.** 10 sq. units
C. 12 sq. units	**D.** 16 sq. units

Answer: C

Explanation: Base AB = 6 and height from C to AB = 4. Area = 1/2 × 6 × 4 = 12 sq. units.

Q43. A triangle has sides 7 cm, 24 cm and 25 cm. What is its area?

A. 72 cm^2	**B.** 84 cm^2
C. 90 cm^2	**D.** 96 cm^2

Answer: B

Explanation: This is a right triangle because $7^2 + 24^2 = 25^2$. Area = 1/2 × 7 × 24 = 84 cm^2.

Q44. A cylinder has radius 3.5 cm and height 8 cm. Using π = 22/7, find its volume.

A. 154 cm^3	**B.** 231 cm^3
C. 308 cm^3	**D.** 352 cm^3

Answer: C

Explanation: $V = \pi r^2 h = (22/7) \times 3.5 \times 3.5 \times 8 = 308\ cm^3$.

Q45. The mean of 6 observations is 18. If five observations are 12, 15, 20, 21 and 25, find the sixth observation.

A. 14	**B.** 15
C. 16	**D.** 17

Answer: B

Explanation: Total = 6 × 18 = 108. Sum of five = 93. Sixth observation = 108 - 93 = 15.

Q46. A card is drawn from cards numbered 1 to 20. What is the probability that the number is a prime?

A. 2/5	**B.** 3/5
C. 7/20	**D.** 9/20

Answer: A

Explanation: Prime numbers from 1 to 20 are 2, 3, 5, 7, 11, 13, 17, 19: 8 primes. Probability = 8/20 = 2/5.

Q47. If 4x + 2y = 16 cuts the y-axis at (0, k), find k.

A. 4	**B.** 6
C. 8	**D.** 10

Answer: C

Explanation: Set x = 0: 2y = 16, so y = 8. Hence k = 8.

Q48. A cyclic quadrilateral has opposite angles in the ratio 2:3. Find the larger of the two opposite angles.

A. 72°	**B.** 90°
C. 108°	**D.** 120°

Answer: C

Explanation: Opposite angles of a cyclic quadrilateral sum to 180°. Let angles be 2x and 3x. Then 5x = 180°, x = 36°, larger angle = 108°.

Q49. A sphere has radius 7 cm. What is its surface area?

A. 154π cm^2	**B.** 196π cm^2
C. 392π cm^2	**D.** 616π cm^2

Answer: B

Explanation: Surface area of a sphere = $4\pi r^2 = 4\pi \times 49 = 196\pi$ cm^2.

Q50. A number is selected from 1 to 24. What is the probability that it is divisible by 2 or 3?

A. 1/2	**B.** 2/3
C. 3/4	**D.** 5/6

Answer: B

Explanation: Multiples of 2: 12, multiples of 3: 8, multiples of 6 counted twice: 4. Favourable = 12 + 8 - 4 = 16. Probability = 16/24 = 2/3.

Answer Key

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

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