STUDENT COPY · SET B

Class 9 · Mathematics Olympiad

Total questions	Total marks	Time	Negative marking
50	60	60 minutes	None

Name: _____ Class/Section: _____ Roll no: _____

Each question has four options, of which only one is correct. Mark your answer on the answer sheet. The Achievers Section carries higher marks per question. Your teacher has the answers.
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Logical Reasoning

15 questions · 1 mark each · 15 marks

Q1. Which letter comes next? E, I, M, Q, ___

(A) Y (B) T (C) U (D) V

Q2. If the 12th of a month is a Tuesday, what day of the week is the 29th of the same month?

(A) Saturday (B) Sunday (C) Thursday (D) Friday

Q3. Sima walks 5 m north, then 3 m east, then 3 m south. Where is Sima now, relative to the starting point?

(A) 3 m north and 3 m east (B) 2 m north and 3 m east

(C) 5 m north and 3 m east (D) 2 m north and 4 m east

Q4. A father is 30 years older than his son. The son is 14 years old now. How old will the father be after 4 years?

(A) 44 years (B) 52 years (C) 48 years (D) 49 years

Q5. Pointing to a boy in a photograph, Anjali said, “This boy is not me, but he is the son of my paternal grandfather’s only son.” How is the boy related to Anjali?

(A) Nephew (B) Brother (C) Uncle (D) Cousin

Q6. Kabir walks 5 m towards north, turns right and walks 7 m, then turns right again and walks 5 m. How far is Kabir from the starting point, and in which direction?

(A) 7 m, West (B) 7 m, East (C) 12 m, North (D) 5 m, East

Q7. Read the statements and choose the conclusion that MUST be true.
All roses are flowers. All flowers need water.

(A) All roses need water. (B) Only roses need water.

(C) All flowers are roses. (D) Some roses do not need water.

Q8. In a certain code JAR is written as LCT. How is PEN written in that code?

(A) PGR (B) NCL (C) RGP (D) SHQ

Q9. In a class, 12 students play cricket, 8 play football and 3 play both games. Every student plays at least one of the two. How many students are there in the class?

(A) 14 (B) 17 (C) 18 (D) 20

Q10. All but one of these numbers are multiples of the same number. Find the one that is not: 21, 28, 35, 49, 67

(A) 67 (B) 28 (C) 21 (D) 35

Q11. 7 : 49 :: 11 : ___

(A) 121 (B) 22 (C) 100 (D) 144

Q12. Which of these figures has exactly 5 lines of symmetry?



(A) (B) (C) (D)

Q13. Which letter comes next? C, E, H, L, ___

(A) P (B) Q (C) O (D) R

Q14. In the first row the numbers are 5, 7 and 34. In the second row they are 6, 3 and 17. In the third row they are 2, 6 and ___ . The same rule applies to every row.

(A) 11 (B) 12 (C) 10 (D) 13

Q15. If RAT is written as 18 - 1 - 20 using the positions of the letters in the alphabet, how is PEN written?

(A) 11 - 22 - 13 (B) 16 - 5 - 14 (C) 14 - 5 - 16 (D) 17 - 6 - 15

Mathematical Reasoning

20 questions · 1 mark each · 20 marks

Q16. For which k do 3x + ky = 7 and 6x + 8y = 10 have no solution?

(A) 2 (B) 8 (C) 4 (D) 5

Q17. Two straight lines intersect. One angle is (3x+20)° and its adjacent angle is 5x°. Find the vertically opposite angle to the smaller one.

(A) 60° (B) 100° (C) 80° (D) 120°

Q18. P,Q,R,S are midpoints of sides AB,BC,CD,DA of a quadrilateral. If AC=10 cm and BD=16 cm, find perimeter of PQRS.

(A) 36 cm (B) 13 cm (C) 52 cm (D) 26 cm

Q19. In quadrilateral ABCD, P,Q,R,S are midpoints of AB,BC,CD,DA. If AC=10 cm and BD=16 cm, perimeter of PQRS is

(A) 26 cm (B) 20 cm (C) 13 cm (D) 52 cm

Q20. Midpoints of the sides of quadrilateral ABCD form a parallelogram. If AC=10 cm and BD=24 cm, its perimeter is

(A) 68 cm (B) 34 cm (C) 17 cm (D) 48 cm

Q21. Diagonals of parallelogram ABCD meet at O. If A(2,-1), B(6,1) and C(8,5), find D.

(A) (-2, -3) (B) (4, 3) (C) (4, 1) (D) (12, 5)

Q22. In a circle with centre O, chord AB subtends angle AOB=120°. Point C lies on the major arc AB. What is angle ACB?

(A) 30° (B) 60° (C) 120° (D) 90°

Q23. Two triangular shelf frames ABC and PQR have AB=PQ, BC=QR and angle B=angle Q. Which conclusion is justified?

(A) Only their areas are equal (B) Frames are congruent by SAS

(C) Data is not enough (D) Frames are congruent by ASA

Q24. If $2^a=3$ and $2^b=5$, what is 2^{2a-b}?

(A) 25/9 (B) 6/5 (C) 15/2 (D) 9/5

Q25. A chord AB subtends 70° at a point on the major arc. What angle does the minor arc AB subtend at the centre?

(A) 70° (B) 220° (C) 35° (D) 140°

Q26. A cube of side 6 cm is cut into 8 equal cubes. By how much does the total surface area increase?

(A) 648 cm^2 (B) 216 cm^2

(C) 432 cm^2 (D) 108 cm^2

Q27. A point on the x-axis is 5 units from (3,4) and has positive x-coordinate. Which point is it?

(A) (6,0) (B) (8,0) (C) (0,0) (D) (3,0)

Q28. In ΔABC, D and E are midpoints of AB and AC. If DE=3x+1 cm and BC=8x-6 cm, find BC.

(A) 13 cm (B) 32 cm (C) 26 cm (D) 22 cm

Q29. Four angles around a point in order are x, 2x+15, x+25 and 2x-10. What is the largest angle?

(A) 100° (B) 125° (C) 80° (D) 55°

Q30. ΔABC and ΔDEF have AB=DE, BC=EF and angle A=angle D. Which statement is certainly true?

(A) Congruence is not certain (B) Congruent by SAS

(C) Congruent by ASA (D) Congruent by SSS

Q31. A cube of side 6 cm is melted into small cubes of side 2 cm. By how much does the total surface area increase?

(A) 216 cm^2 (B) 324 cm^2

(C) 648 cm^2 (D) 432 cm^2

Q32. If ΔABC congruent to ΔBAD in that order, which side is equal to AD?

(A) BD (B) AC (C) AB (D) BC

Q33. For $P(x)=x^3+ax^2+bx+6$, both x-2 and x+1 are factors. Find a+b.

(A) -3 (B) 1 (C) 3 (D) -5

Q34. For $p(x)=2x^3-5x^2+kx-7$, the remainder on division by x+2 is 9. What is k?

(A) 17 (B) 26 (C) -17 (D) -26

Q35. In the ordered data 4, 6, 7, x, 10, the mean equals the median. Given x>7, find x.

(A) 7 (B) 10 (C) 8 (D) 6

Everyday Mathematics

10 questions · 1 mark each · 10 marks

Q36. In a phone game, a score starts at 3 and is multiplied by 3^2 in each of 3 bonus rounds. What is the final score?

(A) 243 (B) 2187 (C) 729 (D) 54

Q37. In triangular plot ABC, D and E are the midpoints of AB and AC. If the boundary BC is 18 m, what is the length of shortcut DE?

(A) 6 m (B) 36 m (C) 18 m (D) 9 m

Q38. Five bus fares have mean ₹26. Four fares are ₹20, ₹25, ₹25 and ₹30. What is the median of all five fares?

(A) ₹30 (B) ₹27 (C) ₹25 (D) ₹26

Q39. Two triangular sign frames ABC and PQR have AB=PQ, AC=PR and BC=QR. Which angle must equal angle A?

(A) angle Q (B) angle P (C) angle C (D) angle R

Q40. A cylindrical water tin is open at the top. Its radius is 7 cm and height is 10 cm. What sheet area is needed?

(A) 189π cm^2 (B) 238π cm^2

(C) 140π cm^2 (D) 490π cm^2

Q41. A plywood sheet is $(\sqrt{7}+\sqrt{3})$ m by $(\sqrt{7}-\sqrt{3})$ m. What is its exact area?

(A) 2 m^2 (B) 10 m^2

(C) $2\sqrt{21}$ m^2 (D) 4 m^2

Q42. At a canteen, idli plates cost ₹30 and juice costs ₹20. A ₹180 bill has x plates and y juices, with x>y. Which (x, y) is possible?

(A) (4, 3) (B) (5, 1) (C) (3, 4) (D) (2, 6)

Q43. A cubical sweet box of side 6 cm is packed with small cubes of side 2 cm. How many small cubes fit with no gaps?

(A) 27 (B) 9 (C) 36 (D) 18

Q44. On a grid map, Meena starts at (−2, 3), walks 5 units east and 7 units south. In which quadrant is she now?

(A) Quadrant I (B) Quadrant III (C) Quadrant IV (D) Quadrant II

Q45. A rectangular garden has length x+7 m and breadth x−7 m. If x=15, what is its area?

(A) 224 m^2 (B) 274 m^2

(C) 64 m^2 (D) 176 m^2

Achievers Section

5 questions · 3 marks each · 15 marks

Q46. A triangular field has sides 13 m, 14 m and 15 m. One-third of its area is covered by a pond. What area is left uncovered?

(A) 56 m^2 (B) 84 m^2

(C) 42 m^2 (D) 28 m^2

Q47. The line ax+by=12 passes through (2,3) and (4,1). What is a+b?

(A) 5 (B) 12/5 (C) 6 (D) 24/5

Q48. Six numbers have mean 12. Five of them are 7, 10, 14, 15 and 18. If one of the six numbers is chosen at random, what is the probability that it is greater than the mean?

(A) 1/3 (B) 2/3 (C) 1/2 (D) 3/5

Q49. A point P on the y-axis is equidistant from A(3,4) and B(-5,2). What are the coordinates of P?

(A) (0,-1) (B) (-1,0) (C) (0,1) (D) (0,3)

Q50. If $a=2+\sqrt{3}$ and $b=2-\sqrt{3}$, what is a^3+b^3?

(A) 40 (B) 64 (C) 56 (D) 52

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