Questions 1 to 10 carry one mark each. Choose the correct answer from the alternatives given.

1. Between two rational numbers
   (a) there is no rational number
   (b) there is exactly one rational number
   (c) there are infinitely many rational numbers
   (d) there are only rational numbers and no irrational numbers

   OR

   The value of $\dfrac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}}$ is equal to

   (a) $\sqrt{2}$ (b) 2
   (c) 4   (d) 8

2. If $p(x) = x^2 - 2\sqrt{2}x + 1,$ then $p(2\sqrt{2})$ is equal to
   (a) 0   (b) 1
   (c) $4\sqrt{2}$ (d) $8\sqrt{2} + 1$

   OR

   If $(x-2)$ is factor of $p(x) = x^3 - 2ax^2 + ax - 1$, then value of a is :

   (a) 0   (b) $\dfrac{7}{6}$

   (c) $-\dfrac{7}{6}$ (d) None of these

3. Distance of the point $(0, -1)$ from the origin is :
   (a) 0   (b) 1
   (c) -1 (d) $\sqrt{2}$

4. If the graph of equation $2x + ky = 10k$, intersect x-axis at point $(5, 0)$, then k is :
   (a) 0   (b) -1
   (c) 2   (d) 1

5. Angles of a triangle are in the ratio 2:4:3. The smallest angle of the triangle is
   (a) 60°   (b) 40°
   (c) 80°   (d) 20°

   OR

   An exterior angle of triangle is 115° and one of the interior opposite angle is 35°. Then, the measure of the smaller of the other two angles is
   (a) 65°   (b) 64°
   (c) 63°   (d) None of these

6. Three angles of a quadrilateral are 75°, 90°, and 75°. The fourth angle is
   (a) 90°.   (b) 95°.
   (c) 105°.   (d) 120°.

7. The total surface area of a cube is 96 cm². The volume of the cube is
   (a) 8 cm³   (b) 512 cm³
   (c) 64 cm³   (d) 27 cm³

8. In a sample study of 642 people, it was found that 514 people have a high school certificate. If a person is selected at random, the probability that the person has a high school certificate is
   (a) 0.5.   (b) 0.6.
   (c) 0.7.   (d) 0.8.

9. Two parallelograms are on equal bases and between the same parallels. The ratio of their areas is
   (a) 1:2.
   (b) 1:1.
   (c) 2:1.
   (d) 3:1.

AI 10. AD is a diameter of a circle and AB is a chord. If $AD = 34$ cm, $AB = 30$ cm, the distance of AB from the centre of the circle is
   (a) 17 cm
   (b) 15 cm
   (c) 4 cm
   (d) 8 cm

Questions 11 to 15 carry one mark each. State true or false.

11. There are infinitely many integers between any two integers.

12. $ABCD$ is a parallelogram and X is the mid-point of AB. If ar $(AXCD) = 24$ cm^2, then ar $(ABC) = 24$ cm^2

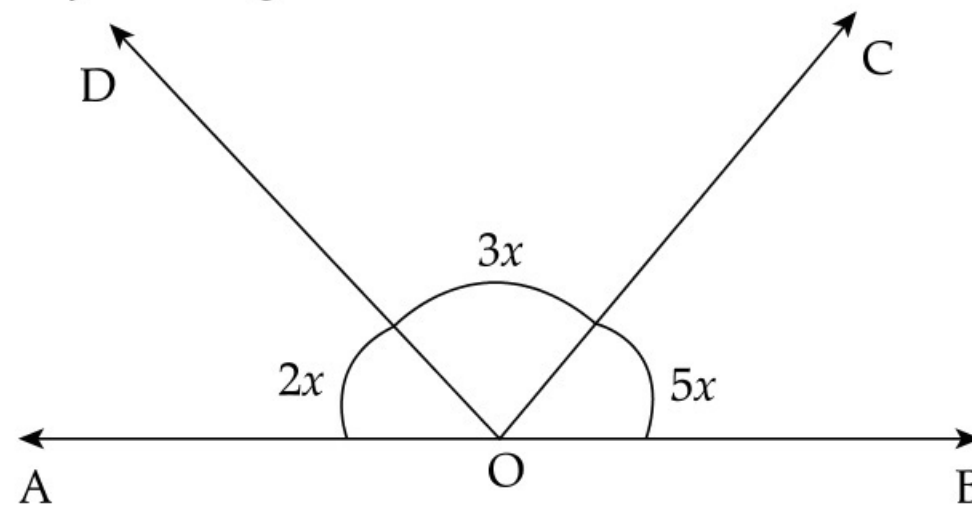13. Diagonals of a rhombus are equal and perpendicular to each other.

OR

The diagonals of a rhombus bisect each other at right angles.

14. If a, b, c are the lengths of three sides of a triangle, then area of a triangle $\sqrt{s(s-a)(s-b)(s-c)}$, where s = perimeter of triangle.

15. A surface has two dimensions.

Questions 16 to 20 carry one mark each

16. Find the value of x from the adjacent figure.

17. The total surface area of a cube is 726 cm^2. Find the length if its edge.

OR

The ratios of the heights and the radii of two cylinders are 1 : 2 and 2 : 1 respectively. Then, find out ratio of their volumes.

18. The angles of a quadrilateral are in the ratio 2 : 3 : 6 : 7. The largest angle of the quadrilateral is ....

19. The sides of a triangle are 7 cm, 24 cm and 25 cm. What will be its area ?

AI 20. Factorise : $y^2 - 8y + 16$.

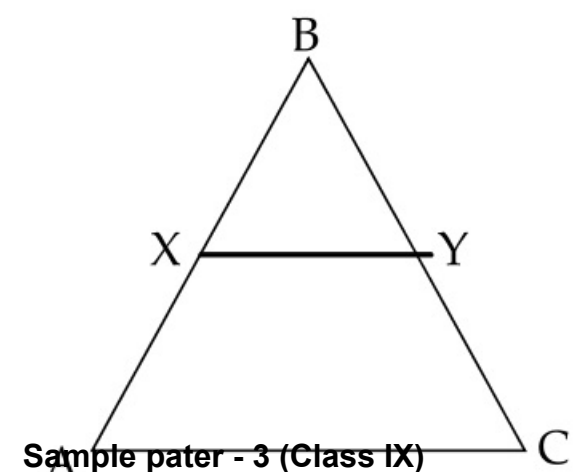**OR**

Evaluate : $249^2 - 248^2$

Section 'B'

Questions 21 to 26 carry two marks each

21. Is zero (0) a rational number ? Justify your answer.

OR

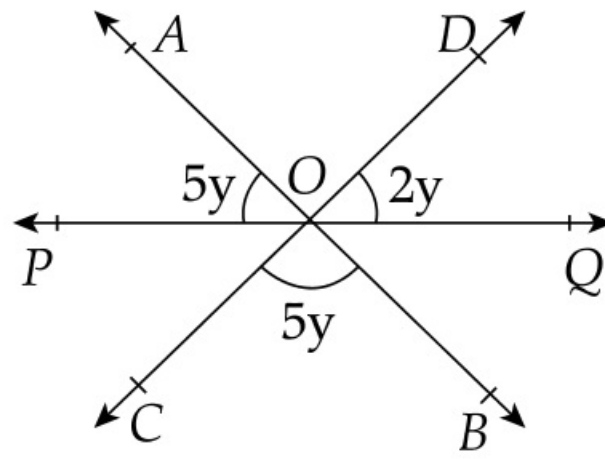**AI** Represent $0.\overline{237}$ in the form of $\dfrac{p}{q}$, where p and q are integers and $q \neq 0$.

22. In the adjoining figure, we have AB = BC, BX = BY. Show that AX = CY (using appropriate Euclid's axiom)

AI **23.** Two supplementary angles are in the ratio 2 : 3, find the angles.

OR

If $\angle AOP = 5y$, $\angle QOD = 2y$, and $\angle BOC = 5y$, in the given figure, find the value of y.

24. An isosceles right triangle has area 200 cm². Find the length of its hypotenuse.

25. Find the mean and mode : 2, 3,4, 5, 0, 1, 3, 3, 4, 3

26. The diameter of the two right circular cones are equal if their slant heights are in the ratio 3 : 2, then what is the ratio of their curved surface areas ?

Section 'C'

Questions 27 to 34 carry 3 marks each

27. Simplify : $\dfrac{73 \times 73 \times 73 + 27 \times 27 \times 27}{73 \times 73 - 73 \times 27 + 27 \times 27}$

28. Determine the point on the graph of the linear equation $2x + 5y = 19$, whose ordinate is $1\dfrac{1}{2}$ times its abscissa.

29. Plot the points A(1, 1), B(–1, 5), C(7, 9) and D (9, 5). Name the type of figure ABCD. In which quadrant the point of intersection of diagonals lie ?

30. ABCD is a parallelogram and line segments AX, CY bisect the angles A and C, respectively. Show that AX || CY.

31. *PQRS* is a quadrilateral with *SQ* as one of its diagonals. If *SR* = *PQ* = 4 cm, *SQ* = 5 cm and *SQ* is perpendicular to both *SR* and *PQ*, show that ar (ΔPSQ) = ar (ΔSRQ).

OR

The angles *A*, *B*, *C* and *D* of a quadrilateral *ABCD* are in the ratio 2 : 4 : 5 : 7. Find the measures of these angles. What type of quadrilateral is it ? Give reasons.
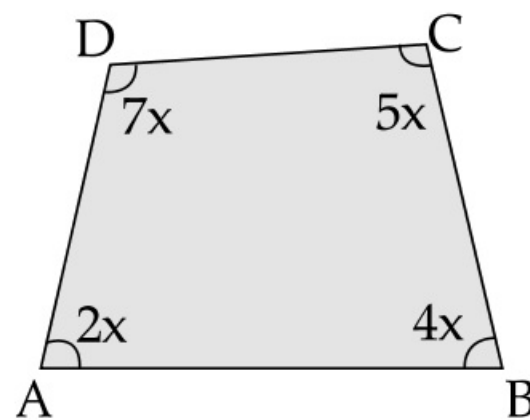
32. If two circles intersect in two points, prove that the line through their centre is the perpendicular bisector of the common chord.

OR

Prove that the quadrilateral formed by the internal angle bisectors of any quadrilateral is cyclic.

33. Find the area of the triangle whose perimeter is 180 cm and two of its sides are of lengths 80 cm and 18 cm. Also calculate the altitude of the triangle corresponding to the shortest side.

34. Two dice are thrown simultaneously 500 times. Each time the sum of two numbers appearing on them is noted and recorded in the following table :

sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	14	30	42	55	72	75	70	53	46	28	15

From the above data, what is the probability of getting a sum :

(i) More than 10.   **(ii)** Betweeen 8 and 12.

OR

Fifty seeds were selected at random from each 5 bags seeds and were kept under standardized conditions favourable to germination. After few days, the number of seeds which had germinated in each collection were counted and recorded as follows :

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	38

What is the probability of germination of

(i) More than 40 seeds in a bag

(ii) 49 seeds in a bag

(iii) More than 35 seeds in a bag

Section 'D'

Questions 35 to 40 carry 4 marks each

35. Show that : $\dfrac{\left[x^{(a+b)}\right]^2 \cdot \left[x^{(b+c)}\right]^2 \cdot \left[x^{(c+a)}\right]^2}{\left(x^a x^b x^c\right)^4} = 1.$

36. Factorise : $6x^3 - 5x^2 - 13x + 12$

OR

Verify $a^3 + b^3 + c^3 - 3abc = \dfrac{1}{2}(a+b+c)\left[(a-b)^2 + (b-c)^2 + (c-a)^2\right]$

37. Cost of 1 pen is (₹)x and that of 1 pencil is (₹)y. Cost of 2 pens and 3 pencils together is (₹)18. Write a linear equation which satisfies this data. Draw the graph for the same.

38. Draw the graph of two lines whose equations are $x+y - 6=0$ and $x - y - 2 = 0$, on the same graph paper. Find the area of triangle formed by the two lines and y axis.

39. A right-angled ΔABC with sides 3 cm, 4 cm and 5 cm is revolved about the fixed side of 4 cm. Find the volume of the solid generated. Also, find the total surface area of the solid.

OR

Find the surface area of a sphere whose volume is $179\dfrac{2}{3}$ cm .

40. Draw a histogram of the weekly expenses of 125 students of a school given below :

Weekly Pocket Expenses (in)	Number of students
0 – 10	10
10 – 20	20
20 – 30	10
30 – 40	15
40 – 70	30
70 – 100	40