

CBSE Board
Class IX Mathematics
Sample Paper 6

Time: 3 hrs

Total Marks: 80

General Instructions:

1. All questions are **compulsory**.
2. The question paper consists of **30** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **6** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 3 marks each and **Section D** comprises of **8** questions of 4 marks each.
3. Question numbers **1 to 6** in **Section A** are multiple choice questions where you are to select **one** correct option out of the given four.
4. Use of calculator is **not** permitted.

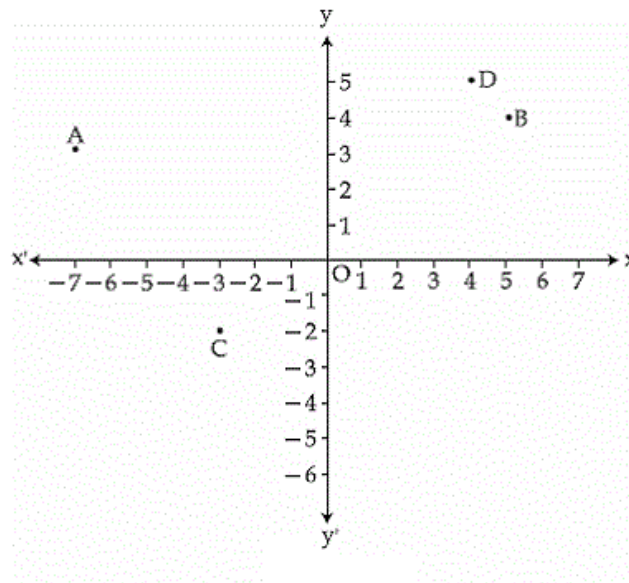
Section A
(Questions 1 to 6 carry 1 mark each)

1. Simplify the given expression: $(3 + \sqrt{3})(2 + \sqrt{2})$
2. Write the equation $7x = 3$ in the Standard form?
3. If a line l intersects two concentric circles at P, Q, R and S, then state whether $PQ = RS$ is true.
4. For a line whose equation is $2x + y = 5$, does point $(2, 1)$ lie on it?
5. Find the Mode of the given data 1, 1, 2, 2, 2, 2, 4, 4, 4, 4, 4, 3, 3, 3, 3, 1, 1, 2, 2, 2, 3, 3, 3.
6. Three angles of a quadrilateral are 60° , 110° and 86° . What is the measure of the fourth angle of the quadrilateral?

Section B

(Questions 7 to 12 carry 2 marks each)

7. Express $\overline{0.975}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
8. See the given figure and answer the following:

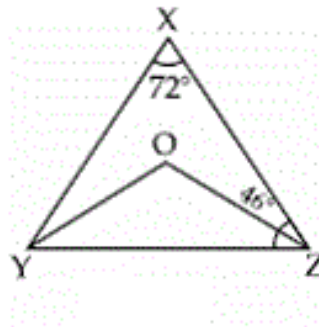


- (i) Coordinates of point A
 - (ii) Abscissa of point D
 - (iii) The point identified by the coordinates (5, 4)
 - (iv) Coordinates of point C
9. Factorise: $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$
 10. What is the area of the triangle having sides of lengths 7 cm, 8 cm and 9 cm?
 11. A rectangular sheet of card paper, 44 cm \times 20 cm in size, is rolled along its length and a cylinder is formed. Find the volume of the cylinder.
 12. Two angles are complementary. The larger angle is 3° less than twice the measure of the smaller angle. Find the measure of each angle

Section C

(Questions 13 to 22 carry 3 marks each)

13. Express $5.\overline{347}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$.
14. $(x + 2)$ is one of the factors of the polynomial $x^3 + 13x^2 + 32x + 20$. Find its remaining factors.
15. In the figure, $\angle X = 72^\circ$, $\angle XZY = 46^\circ$. If YO and ZO are bisectors of $\angle XYZ$ and $\angle XZY$, respectively of $\triangle XYZ$; find $\angle OYZ$ and $\angle YOZ$.



16. Find ab, if $a + b = \sqrt{11}$, $a^2 + b^2 = 5$
17. In $\triangle ABC$, BE and CF are altitudes on the sides AC and AB, respectively, such that $BE = CF$. Using RHS congruency rule, prove that $AB = AC$.
18. A survey was undertaken in 30 classes at a school to find the total number of left-handed students in each class. The table below shows the results:

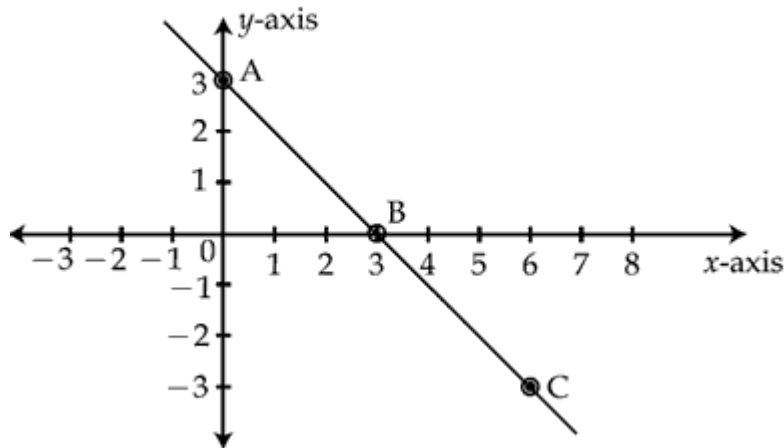
No. of left-handed students	0	1	2	3	4	5
Frequency (no. of classes)	1	2	5	12	8	2

A class was selected at random.

- (a) Find the probability that the class has 2 left-handed students.
- (b) What is the probability that the class has at least 3 left-handed students?
- (c) Given that the total number of students in the 30 classes is 960, find the probability that a student randomly chosen from these 30 classes is left-handed.

19. Observe the graph and answer the following questions:

- Write the co-ordinates of points B and C.
- Find one more solution of the line passing through A and B.
- Write equations of the x-axis and y-axis.



20. Solve:

$$x - \frac{2}{3}y = \frac{8}{3}, \frac{2x}{5} - y = \frac{7}{5}.$$

- The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of white-washing its curved surface at the rate of Rs. 210 per 100 m².
- The distance (in km) of 40 engineers from their residence to place of work were found as follows:

5	3	10	20	25	11	13	7	12	31
2	19	10	12	17	18	11	32	17	16
3	7	9	7	8	3	5	12	15	18
12	12	14	2	9	6	15	15	7	6

Construct a grouped frequency distribution table with class size 5 for the data given above taking the first interval as 0 - 5 (5 not included). What main feature do you observe from this tabular representation?

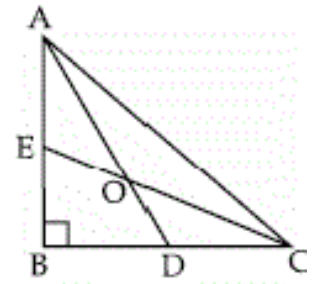
Section D

(Questions 23 to 30 carry 4 marks each)

23. Prove that: $\left(\frac{1}{4}\right)^{-2} - 3 \times 8^{\frac{2}{3}} \times 4^0 + \left(\frac{9}{16}\right)^{-\frac{1}{2}} = \frac{16}{3}$

24. In the figure, AD and CE are the bisectors of $\angle A$ and $\angle C$, respectively.

If $\angle ABC = 90^\circ$, then find $\angle AOC$.



25. The polynomial $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$ when divided by $(x + 1)$ leaves the remainder 19. Find the value of a . Also find the remainder when $p(x)$ is divided by $x + 2$.
26. Prove that: If two lines intersect each other, then the vertically opposite angles are equal.
27. Sonu and Monu had adjacent triangular fields with a common boundary of 25 m. The other two sides of Sonu's field were 52 m and 63 m, while Monu's were 114 m and 101 m. If the cost of fertilization is Rs 20 per sq m, then find the total cost of fertilization for both of Sonu and Monu together.
28. Prove that the medians of an equilateral triangle are equal.
29. There is a triangular field PQR whose corner angles P, Q and R have been measured as 50° , 60° and 70° , respectively. Three friends Anuja, Nikita and Raghav daily go on morning walk and walk along AB, BC and AC, respectively. Who walk the maximum distance among these three? Who walks the least? What value is indicated from this action?
30. (i) Multiply $9x^2 + 25y^2 + 15xy + 12x - 20y + 16$ by $3x - 5y - 4$ using suitable identities.
(ii) Factorise: $a^2 + b^2 - 2(ab - ac + bc)$.