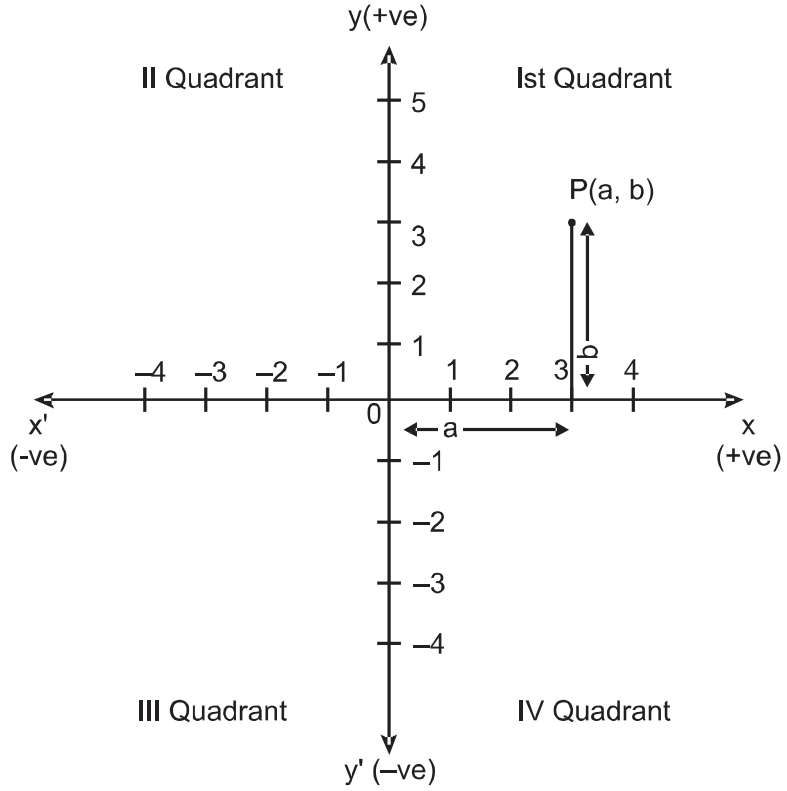
CHAPTER-3

CO-ORDINATE GEOMETRY

KEY POINTS

- **Coordinate Axes :** The position of a point in a plane is determined with reference to two fixed mutually perpendicular lines, called coordinate axes.



The horizontal line xox' is called x-axis.

The vertical line yoy' is called y-axis.

The intersection point of these two lines is called origin. It is represented by O.

- **Coordinates :** Location of a point P in cartesian system, written in the form of ordered pair say P(a, b) as shown in figure above.

a is the length of perpendicular of P (a, b) from y-axis and is called abscissa of P.

b is the length of perpendicular of P (a,b) from x-axis and is called ordinate of P.

- Location of a point P (a, b) on graph with sign convention –

  where a and b are such that —

	Value of Point	Sign of Point	Location of Point
(i)	$a = 0, b = 0$	–	origin
(ii)	$a > 0, b > 0$	(+, +)	Ist Quadrant
(iii)	$a < 0, b > 0$	(–, +)	IInd Quadrant
(iv)	$a < 0, b < 0$	(–, –)	IIIrd Quadrant
(v)	$a > 0, b < 0$	(+, –)	IVth Quadrant

  Note : If a point lie on x-axis or y-axis it does not lie in any quadrant.

- Coordinate of a point on x-axis are of the form (x, o)
- Coordinate of a point on y-axis are of the form (o, y).

Part-A

1. In which quadrant do the given points lie.

   (i) (3, –2) (ii) (17, –30) (iii) (–2, 5)

   (iv) (–50, –20) (v) (10, 100) (vi) (–81, 80)

2. On which axis do the given points lie.

   (i) (11, 0) (ii)(–11, 0) (iii) (0, 14)

   (iv) (0, –100)

3. The abscissa and ordinate of a point A are –3 and –5 respectively then write down the coordinate of A.

4. Write the name of the point where both axes intersect?

5. Is P(7, 0) and Q (0, 7) represent the same point?

6. In which quadrants x coordinate is negative?

7. Name the figure formed when we plot the points (0, 0), (4, 4) and (0, 4) on a graph paper.

8. In which quadrant, does the point A (x, y) with values x >o and y > 0 exists.

9. If Q is a point on x-axis then its ordinate will definitely be _____.

10. Write the coordinates of the fourth vertex of a square when three of its vertices are given by (1, 2) (5, 2) (5, –2).

11. The perpendicular distance of the point P (5, 2) from x-axis is _____ and from y-axis is _____.

12. The perpendicular distance of the point Q (–116, –80) from x-axis is _____ and from y-axis is _____.

13. If abscissa of a point A is positive & ordinate is negative then in which quadrant do A lie?

14. Write the coordinates of a point whose perpendicular distance from x-axis is 5 units & perpendicular distance from y-axis is 3 & it lies in II quadrant.

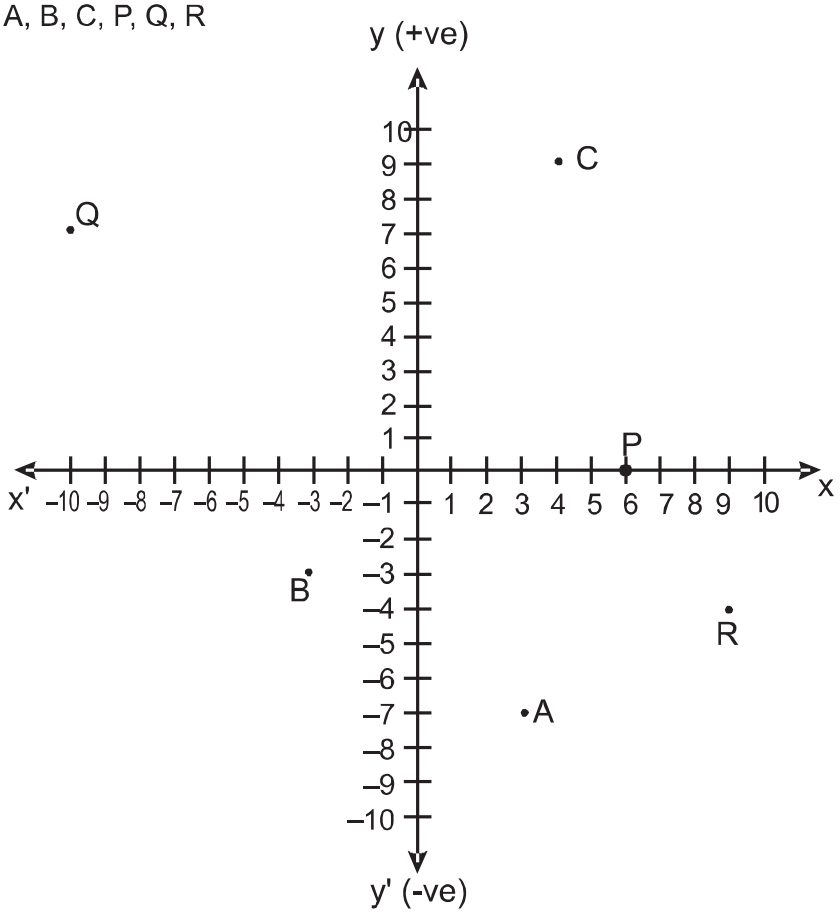
15. Draw the Cartesian plane on a graph paper and plot the given points.

(i) A (3, 5) (ii) B (–7/2, 0) (iii) C (2, –6)

(iv) D (–6, –4) (v) E (0, –5/2) (vi) F (8, 0)

16. Write the coordinates of each of points in the given figure.

A, B, C, P, Q, R



17. Point P (4, 3) is in the first quadrant. Find the coordinate of the point Q, opposite to P in fourth quadrant.

18. Find the distance of point (8, 3) from x axis.

19. Write the name of the figure formed by joining the points A (–3, 0), B (0, 3) and C (3, 0) in the cartesian plane.

20. Write the coordinates of the point that lies on y-axis and is at a distance of 2 units in upward direction.

Part – B

21. If the mirror image of a point (x, y) about x-axis is (x, –y) then the mirror image of the point S (–5, 7) about x-axis is _____.

22. Find the distance of the point P (4, 0) from origin.

23. Write the mirror image of (4, –3) about y-axis.

Part – C

24. Draw a line segment on a graph paper whose end points lies in first quadrant and third quadrant. Write the coordinates of its end points and mid point of line segment.

25. Plot the points A (2, 4) & B (2, –5) whose x-coordinates are same. Is this line AB parallel to any of the axes. If yes, to which axis is it parallel ?

26. Plot the points P (2, –3) & Q (–5, –3) whose ordinates are same. To which axis the line P Q is parallel ?

27. Plot the points A (7, 6) & B (7, –6) on graph paper. Join them & answer the following :

    (i) Write the coordinate of the point where line AB cuts the x-axis?

    (ii) To which axis, line AB is parallel ?

28. Draw a triangle ABC on graph paper having the coordinates of its vertices as A (–2, 0), B (4, 0) and C (1, 5). Also find the area of triangle.

29. If we plot the points P(5, 0), Q (5, 5), R(–5, 5) and S (–5, 0), which figure will we get? Name the axis of symmetry of this figure?

30. Find the coordinates of a point which is equidistant from the two points (–4, 0) and (4, 0). How many of such points are possible satisfying the condition?

31. Draw a quadrilateral with vertices A (4, 3), B(–4, 3), C(–4, –3) and D(4, –3). Draw its diagonals and write the coordinates of the point where the diagonals cut each other?

Part – D

32. A rectangular field is of length 10 units & breadth 8 units. One of its vertex lie on the origin. The longer side is along x-axis and one of its vertices lie in first quadrant. Find all the vertices.

33. Plot the points B (5, 3), E(5, 1), S (0, 1) and T(0, 3) and answer the following :

    (i) Join the points and name the figure obtained.

    (ii) Find the area of figure.

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COORDINATE GEOMETRY

ANSWERS

1. (i) IV Quadrant (ii) IV Quadrant (iii) II Quadrant
   (iv) III Quadrant (v) I Quadrant (vi) II Quadrant
2. (i) x-axis (ii) x-axis (iii) y-axis
   (iv) y-axis
3. (–3, –5) 4. Origin 5. No
6. II and III Quadrant 7. Right Angle Triangle
8. Ist Quadrant 9. 0 10. (1, –2)
11. x-axis – 2 units; y-axis – 5 units
12. x-axis – 80 units; y-axis – 116 units 13. IV
14. (–3, 5)
16. A (3, –7), B(–3, –3), C(4, 9), P(6, 0), Q(–10, 7), R(9, –4)
17. (4, –3) 18. 3 units
19. Triangle or isosceles Triangles 20. (0, 2)
21. (–5, –7) 22. 4 units 23. (–4, –3)
25. Yes, y-axis 26. x-axis
27. (i) (7, 0) (ii) Parallel to y-axis
28. 15 square units 29. Rectangle, y-axis
30. Any point on y-axis, infinite 31. At origin (0, 0)
33. (i) Rectangle (ii) 10 units

Practice Test

COORDINATE GEOMETRY

Time : 50 Min. M.M. 20

1. In which quadrant, the point (x, y) will lie? (Where x is a positive and y is a negative number). (1)

2. Write the y-coordinate of a point which lies on x-axis. (1)

3. Find the value of x and y if: (2)

   (a) (x – 4, 7) = (4, 7)

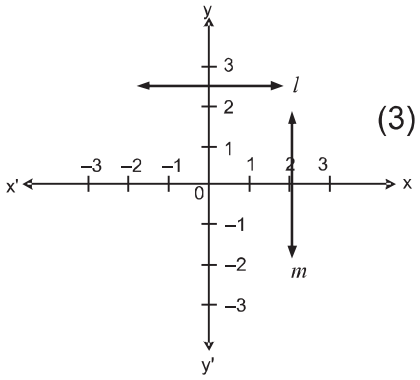
   (b) (1, 2y – 3) = (1, 7)

4. What is the distance of a point (7, 6) from x-axis and y-axis? (2)

5. Plot the following points in a Cartesian plane. (3)

   (–3, 5), (–2, 0), (–4, 0)

6. Write the equations of lines l and m as shown in the figure. Also name the line which is represented by x = 0. (3)



7. Plot the points O(0, 0), A(4, 0) and C(0, 6). Find the coordinates of the fourth point B such that OABC forms a rectangle. (4)

8. The base AB of two equilateral triangle ABC and ABD with side 2a, lies along the x-axis such that the mid point of AB is at the origin. Find the coordinates of two vertices C and D of the triangles. (4)