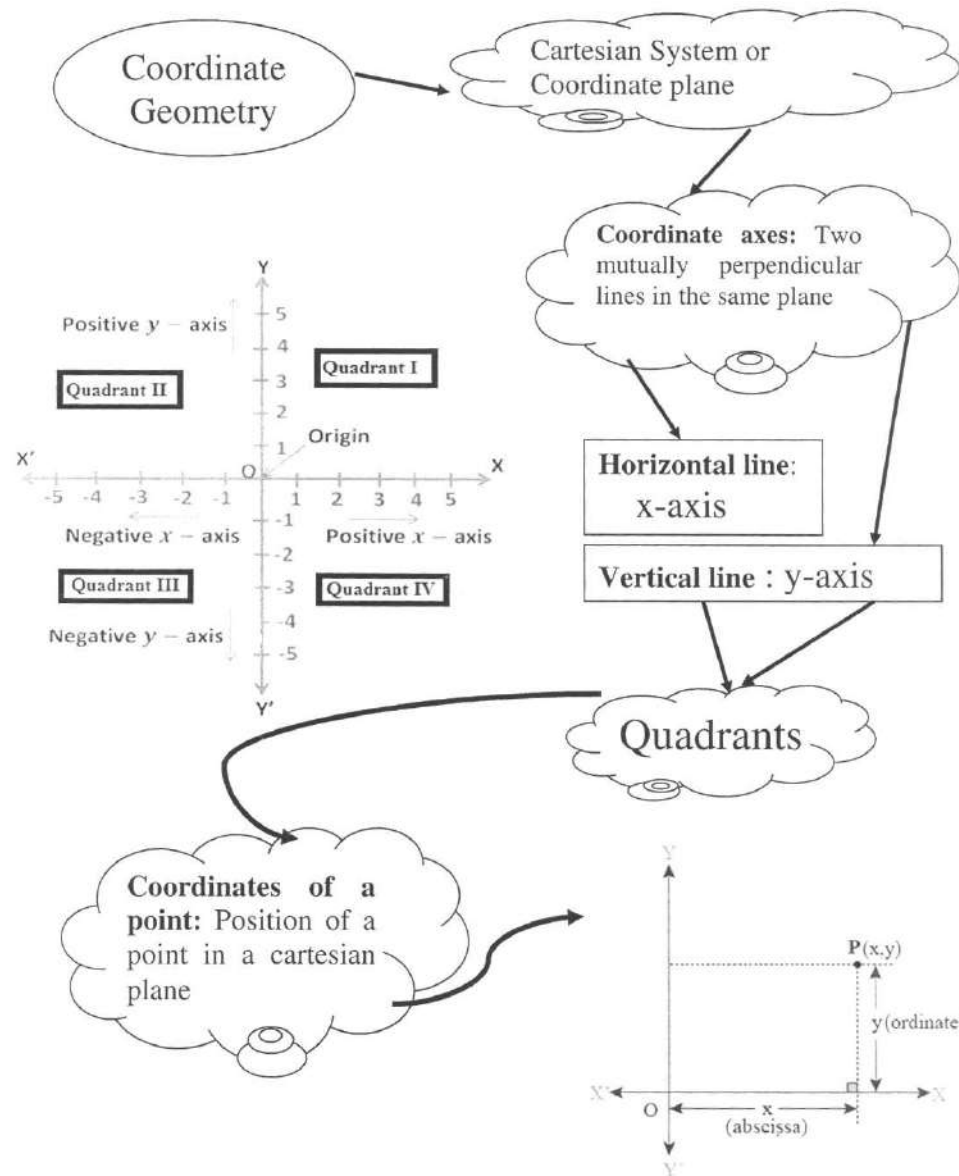


CHAPTER-3  
**CO-ORDINATE GEOMETRY**

**MIND MAP**



### Key Points

- Co-ordinate Geometry is the branch of Mathematics in which we study the position of any object lying in a plane, called the Cartesian plane.
- In Cartesian system; there are two mutually perpendicular straight lines  $xx'$  and  $yy'$  intersecting at origin  $O$ .
- These mutually perpendicular straight lines, known as  $x$ -axis and  $y$ -axis, divides the plane into four quadrants.
- The coordinates of a point is the position of the point in Cartesian plane and are determined by perpendicular distance from  $x$ -axis and  $y$ -axis.
- The perpendicular distance of a point from  $y$ -axis is called abscissa ( $x$ -coordinate) and from  $x$ -axis is called ordinate ( $y$ -coordinate).
- Any point in the Cartesian plane is shown by  $P(a, b)$  where  $(a, b)$  are coordinates of point  $P$ . where  $a$  is abscissa and  $b$  is ordinate.

abscissa ( $x$ )	ordinate ( $y$ )	Position of point
positive (+)	positive (+)	Quadrant I
positive (+)	negative (-)	Quadrant IV
negative (-)	negative (-)	Quadrant III
negative (-)	positive (+)	Quadrant II

- The coordinate of a point on  $x$ -axis is of the form  $(x, 0)$  and on  $y$ -axis is of the form  $(0, y)$ .
- If  $x$ -coordinate of two or more points are same, then the line joining these points is parallel to  $y$ -axis.
- If  $y$ -coordinate of two or more points are same, then the line joining these points is parallel to  $x$ -axis.

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

- The mirror image of a point is just a reflection of this point about one of the axes.

Mirror image about  $x$ -axis: sign of abscissa remains same but sign of ordinate changes.

Mirror image about  $y$ -axis: sign of abscissa changes but sign of ordinate remains same.

Mirror image about origin: signs of both-abscissa and ordinate changes.

**Very Short Answer Questions (1 mark)**

1. **The abscissa of a point is the distance of the point from**  
(a)  $x$ -axis (b)  $y$ -axis  
(c) origin (d) None of these
2. **The  $y$ -coordinate of a point is the distance of that point from**  
(a)  $x$ -axis (b)  $y$ -axis  
(c) origin (d) None of these
3. **If both the coordinates of a point are negative then that point will lie in**  
(a) First quadrant (b) Second quadrant  
(c) Third quadrant (d) Fourth quadrant
4. **If abscissa of a point is zero then that point will lie**  
(a) on  $x$ -axis (b) on  $y$ -axis  
(c) at origin (d) in Ist quadrant
5. **If  $x > 0$  and  $y < 0$ , then the point  $(x, -y)$  lies in**  
(a) I quadrant (b) II quadrant  
(c) III quadrant (d) IV quadrant
6. **Point  $(a, 0)$  lies**  
(a) on  $x$ -axis (b) on  $y$ -axis  
(c) in third quadrant (d) in fourth quadrant
7. **The signs of abscissa and ordinate of a point in the second quadrant are respectively.**  
(a)  $+, +$  (b)  $-, -$   
(c)  $-, +$  (d)  $+, -$
8. **The ordinate of a point is positive in**  
(a) I and IV quadrants (b) I quadrant only  
(c) I and II quadrants (d) I and III quadrants
9. **The point which lies on  $y$ -axis at a distance of 10 units in the negative direction of  $y$ -axis is**  
(a)  $(10, 0)$  (b)  $(0, 10)$   
(c)  $(-10, 0)$  (d)  $(0, -10)$

10. The end points of a line segment lies in I quadrant and III quadrant. The line segment may pass through
- (a) origin (b) negative x-axis  
(c) positive y-axis (d) quadrant II
11. The point whose abscissa and ordinate have different signs will lie in
- (a) I and II quadrants (b) I and III quadrants  
(c) II and III quadrants (d) II and IV quadrants
12. Which of the point  $P(0, 3)$ ,  $Q(1, 0)$ ,  $R(0, -1)$ ,  $S(-5, 0)$ ,  $T(1, 2)$  do not lie on x-axis?
- (a)  $P$  and  $R$  only (b)  $Q$  and  $S$  only  
(c)  $P$ ,  $R$  and  $T$  (d)  $Q$ ,  $S$  and  $T$
13. If the coordinates of the points are  $P(-2, 3)$  and  $Q(-3, 5)$  then (abscissa of  $P$ ) – (abscissa of  $Q$ ) is
- (a)  $-5$  (b)  $1$   
(c)  $-1$  (d)  $-2$
14. Point  $(1, 1)$ ,  $(1, -1)$ ,  $(-1, 1)$ ,  $(-1, -1)$
- (a) lie in I quadrant (b) lie in III quadrant  
(c) lie in I and III quadrants (d) do not lie in the same quadrant
15. The point of intersection of the coordinates axes is
- (a) Abscissa (b) Ordinate  
(c) Quadrant (d) Origin
16. The abscissa and ordinate of the origin are
- (a)  $(1, 0)$  (b)  $(1, 1)$   
(c)  $(0, 1)$  (d)  $(0, 0)$
17. The angle formed between the coordinate axes is
- (a) Zero angle (b) Right angle  
(c) Acute angle (d) Obtuse angle
18. The perpendicular distance of the point  $p(-4, -3)$  from x-axis is
- (a)  $-4$  units (b)  $-3$  units  
(c)  $4$  units (d)  $3$  units

19. The perpendicular distance of the point  $p(-7, 2)$  from y-axis is
- (a)  $-7$  units (b)  $7$  units  
(c)  $2$  units (d)  $-2$  units
20. The distance of the point  $p(3, 4)$  from the origin is
- (a)  $3$  units (b)  $4$  units  
(c)  $7$  units (d)  $5$  units
21. Which of the points  $A(-5, 0), B(0, -3), C(3, 0), D(0, 4)$  are closer to the origin
- (a)  $A$  (b)  $B$   
(c)  $D$  (d) Points  $B$  and  $C$  both
22. The mirror image of the point  $(0, 3)$  along y-axis is
- (a)  $(0, -3)$  (b)  $(0, 3)$   
(c)  $(3, 0)$  (d)  $(-3, 0)$
23. The coordinate axes divide the plane into four parts, each part is called \_\_\_\_\_.
24. If the coordinates of a point are  $(-2, 5)$ , then its ordinate is \_\_\_\_\_ and its abscissa is \_\_\_\_\_.
25. The point  $(200, -111)$  lies in the \_\_\_\_\_ quadrant.
26. The abscissa of any point on the y-axis is \_\_\_\_\_.
27. The ordinate of any point on the x-axis is \_\_\_\_\_.
28. The points  $(0, 0), (0, 4)$  and  $(4, 0)$  form a/an \_\_\_\_\_ triangle.
29. If  $(x, y)$  represents a point and  $xy > 0$ , then the point may lie in \_\_\_\_\_ or \_\_\_\_\_ quadrant.
30. The points with coordinates  $(3, -1)$  and  $(-1, 3)$  are at \_\_\_\_\_ (same/different) positions of the coordinate plane.
31. If the ordinate of points is  $7$  and abscissa is  $-5$ , then its coordinates are \_\_\_\_\_.
32. The coordinates of a point lying on x-axis having abscissa  $5$  are \_\_\_\_\_.
33. The co-ordinates of point describe the point in the place \_\_\_\_\_.
34. The coordinates of a point, which lies on negative x-axis at a distance of  $6$  units from y-axis, are \_\_\_\_\_.

35. If the coordinates of the points are  $P(0, -1)$  and  $Q(2, 1)$  then (abscissa of  $P$ ) – (abscissa of  $Q$ ) is \_\_\_\_\_.
36. The measure of the angle between coordinate axes is \_\_\_\_\_.
37. In which quadrant do the given points lie.
- |                 |                   |
|-----------------|-------------------|
| (i) $(3, -2)$   | (ii) $(17, -30)$  |
| (iii) $(-2, 5)$ | (iv) $(-50, -20)$ |
| (v) $(10, 100)$ | (vi) $(-81, 80)$  |
38. On which axis do the given points lie:
- |                   |                 |
|-------------------|-----------------|
| (i) $(11, 0)$     | (ii) $(-11, 0)$ |
| (iii) $(0, -100)$ | (iv) $(0, 14)$  |
39. The abscissa and ordinate of a point  $A$  are  $-3$  and  $-5$  respectively then write down the coordinates of  $A$ .
40. Do  $P(7, 0)$  and  $Q(0, 7)$  represent the same point?
41. In which quadrant x coordinate is negative?
42. Name the figure formed when we plot the points  $(0, 0)$ ,  $(4, 4)$  and  $(0, 4)$  on a graph paper.
43. In which quadrant, does the point  $A(x, y)$  with values  $x > 0$  and  $y > 0$  exists?
44. Write the coordinates of the fourth vertex of a square when three of its vertices are given by  $(1, 2)$   $(5, 2)$   $(5, -2)$ .
45. If abscissa of any point is positive & ordinate is negative then in which quadrant do the point lie?
46. Write the coordinates of point whose perpendicular distance from x-axis is 5 units & perpendicular distance from y-axis is 3 units & it lies in II quadrant.
47. In which quadrant will a point lie if its both the coordinates are positive?
48. Write the coordinates of the point at which two coordinate axes meet.
49. Write the coordinates of the point which lies at a distance of x-units from x-axis and y units from y-axis.
50. Find the coordinates of the point which lies on x-axis at a distance of 5 units from y-axis.
51. Find the coordinates of the point which lies on y-axis at a distance of 9 units from x-axis in the negative direction.

52. In which quadrant of a Cartesian plane the ordinate of a point will be positive and abscissa will be negative?
53. On which axis the point  $A(-3, 0)$  lies?
54. Which axis is parallel to the line joining the points  $(2, 4)$  and  $(2, -5)$ ?
55. Find the image of the point  $(2, 3)$  about x-axis.
56. Find the mirror image of the point  $(-5, 6)$  about y-axis.
57. In which quadrant the mirror image of  $(-1, -4)$  lie about y-axis?
58. A point is in II quadrant. In which quadrant will its mirror image lie along x-axis?

**Short answer type-I questions (2 marks)**

59. Find the co-ordinates of two points on x-axis and two points on y-axis which are at equal distance from the origin.
60. Name the quadrant in which the graph of point  $A(x, y)$  lies when
  - (i)  $x > 0$  and  $y > 0$
  - (ii)  $x < 0$  and  $y < 0$
61. Find the coordinates of the vertices of a rectangular figure placed in III quadrant in the Cartesian plane with length  $p$  unit on x-axis and breadth  $q$  units on y-axis.
62. Write the coordinates of any two points on the line segment joining the points  $A(4, -1)$  and  $B(4, 5)$ .

**Short answer type-II questions (3 marks)**

63. 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?
64. 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 this condition?
65. 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.
66. Name the figure obtained by joining the points  $B(5, 3)$ ,  $E(5, 1)$ ,  $S(0, 1)$  and  $T(0, 3)$ . Also find the area of the figure.
67. Plot the point  $P(-5, 4)$  and from it draw  $PM$  and  $PN$  as perpendicular to x-axis and y-axis respectively. Write the coordinates of the points  $M$  and  $N$ .

**CHAPTER-3**  
**CO-ORDINATE GEOMETRY**

**Answers**

- |                                     |   |
|-------------------------------------|---|
| 1. (b) $y$ -axis                    | 26. 0   |
| 2. (a) $x$ -axis                    | 27. 0   |
| 3. (c) Third quadrant               | 28. isosceles   |
| 4. (b) $y$ -axis                    | 29. I or III  |
| 5. (d) IV quadrant                  | 30. different   |
| 6. (a) on $x$ -axis                 | 31. $(-5, 7)$   |
| 7. (c) $-$ , $+$                    | 32. $(5, 0)$  |
| 8. (c) I and II quadrants           | 33. uniquely  |
| 9. (d) $(0, -10)$                   | 34. $(-6, 0)$   |
| 10. (a) origin                      | 35. $-2$  |
| 11. (d) II and IV quadrants         | 36. $90^\circ$  |
| 12. (c) $P$ , $R$ and $T$           | 37. (i) & (ii) IV quadrant<br>(iii) & (vi) II quadrant<br>(iv) III quadrant<br>(v) I quadrant |
| 13. (b) 1                           | 38. (i) & (ii) $x$ -axis<br>(iii) & (iv) $y$ -axis  |
| 14. (d) do not lie in same quadrant | 39. $(-3, -5)$  |
| 15. (d) origin                      | 40. No because abscissa and ordinates<br>are different for both the points.                   |
| 16. (d) $(0, 0)$                    | 41. II and III  |
| 17. (b) Right angle                 | 42. Triangle  |
| 18. (d) 3 units                     | 43. I quadrant  |
| 19. (b) 7 units                     | 44. $(1, -2)$   |
| 20. (d) 5 units                     | 45. IV quadrant   |
| 21. (d) points $B$ and $C$ both     |   |
| 22. (b) $(0, 3)$                    |   |
| 23. quadrant                        |   |
| 24. $5, -2$                         |   |
| 25. IV quadrant                     |   |



46.  $(-3, 5)$   
47. I quadrant  
48.  $(0, 0)$   
49.  $(y, x)$   
50.  $(5, 0)$   
51.  $(0, -9)$   
52. II quadrant  
53.  $x$ -axis  
54.  $y$ -axis  
55.  $(2, -3)$   
56.  $(5, 6)$   
57. IV quadrant  
58. III quadrant  
59.  $(\pm a, 0), (0, \pm a)$  where  $a$  is any real number  
60. (i) I quadrant  
(ii) III quadrant  
61.  $(0, 0), (-p, 0), (-p, -q), (0, -q)$   
62. Any two point with abscissa = 4 and ordinate lying between  $-1$  and  $5$ .  
63. Rectangle,  $y$ -axis  
64. Any point on  $y$ -axis, infinite  
65.  $(0, 0), (10, 0), (10, 8), (0, 8)$   
66. Figure : Rectangle  
Area : 10 sq. units.  
67. M  $(-5, 0)$   
N  $(0, 4)$

**CHAPTER-3**  
**COORDINATE GEOMETRY**  
**PRACTICE TEST**

**Time: 1 hr.**

**M.M.: 20**

1. In which quadrant, the point  $(x, y)$  will lie, where  $x$  is positive and  $y$  is negative number? (1)
2. Write the coordinate of a point at a distance of 5 units from  $x$ -axis lying in II quadrant. (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. In which quadrant, do the following points lie? (3)  
(i)  $(4, -2)$  (ii)  $(-3, 7)$   
(iii)  $(-1, -2)$
6. Write the mirror image of following points along  $x$ -axis. (3)  
 $(-3, 5)$ ,  $(2, 0)$ ,  $(-4, -7)$
7. Consider the points  $O(0, 0)$ ,  $A(4, 0)$  and  $B(4, 6)$ . Find the length of  $OA$  and  $AB$ . Find the coordinates of the fourth point  $C$  such that  $OACB$  forms a rectangle. (3)
8. The base  $AB$  of two equilateral triangles  $ABC$  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. Which type of Quadrilateral in  $ABCD$ ? (5)