## 9th Coordinate Geometry: Key concepts

⇒ **Coordinate Geometry:** The branch of mathematics in which geometric problems are solved through algebra by using the coordinate system is known as coordinate geometry.

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

⇒ **Coordinate System,** position of a point is described by ordered pair of two numbers.

⇒ **Ordered pair:** A pair of numbers a and b listed in a specific order with 'a' at the first place and 'b' at the second place is called an ordered pair (a, b). Note that (a, b) ≠ (b , a) and $(x, y) = (y, x)$, if $x = y$.

⇒ P(x,y) be any point in the plane. 'x' the first number denotes the distance of point from Y-axis and 'y' the second number denotes the distance of point from X-axis.
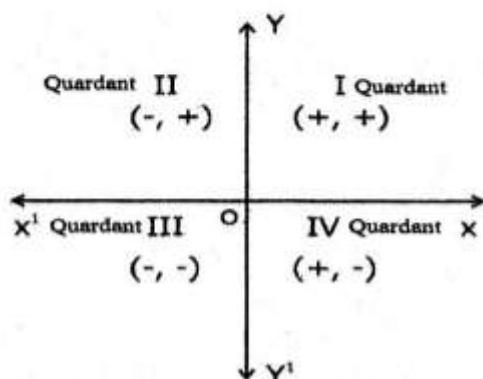
⇒ The coordinates of origin are (0,0)

⇒ Every point on the x-axis is at a distance o unit from the X-axis. So its ordinate is 0.

⇒ Every point on the y-axis is at a distance of 0 unit from the Y-axis. So, its abscissa is 0.

⇒ The coordinates of a point on the x-axis are of the form (x, 0) and that of a point on the y-axis are (0, y).

⇒ A point in the first quadrant will be of the form (+, +). Similarly, a point in the second, third and fourth quadrants will be of the form (−, +), (−, −) and (+, −) respectively.

Section - A

Q.1 on which axes do the given points lie?

(i) (7, 0) (ii) (0, -3) (iii) (0, 6) (iv) (-5, 0)

Q.2 In which quadrants do the given points lie?

(i) (4, -2) (ii) (-3, 7) (iii) (-1, -2) (iv) (3, 6)

Q.3 Is P (3, 2) & Q(2, 3) represent the same point?

Q.4 In which quadrant points P(3,0), Q(6,0) , R (-7.0), S (0,-6), lie?

Q.5 If a<0 and b<0, then the point P(a,b) lies in

(a) quadrant IV   (b) quadrant II

(c) quadrant III   (d) quadrant I

Q.6.The points (other than the origin) for which the abscissa is equal to the ordinate lie in

(a) Quadrant I only   (b) Quadrant I and II

(c) Quadrant I & III   (d) Quadrant II only.

Q.7 The perpendicular distance of the point P(4,3) from the y axis is

(a) 3 Units (b) 4 Units (c) 5 Units (d) 7 Units

Q.8 The area of triangle OAB with 0(0,0), A(4,0) & B(0,6) is   (a) 8 sq. unit   (b) 12 sq. units

(c) 16 sq. units   (d) 24 sq. units

Q. 9. The centre O of a circle lies on the origin. If the radius of the circle is 3 units, the co-ordinates of point A, which lies on the circle, are:

(a) (3, 0) (b) (0, 3) (c) (− 3, 0) (d) (0, − 3)

Q.10. If $(x, y) = (y, x)$, then:

(a) $x − y = 0$ (b) $x + y = 0$ (c) $xy = 0$ (d) x/y=0

Q.11. Abscissa of all the points on the x-axis is :

(a) 0 (b) 1 (c) 2 (d) any number

Q.12. Ordinate of all points on the x-axis is:

(a) 0 (b) 1 (c) − 1 (d) any number

Q.13. a point is at a distance of 3 units from the x-axis and 5 units from the y-axis. Which of the following may be the co-ordinates of the point?

(a) (5, 3) (b) (−5, 3) (c) (−5, −3) (d) all the above

Q.14. Abscissa of a point is positive in :

(a) I and II quadrant   (b) I and IV quadrant

(c) I quadrant only   (d) IV quadrant only

Q.15. In the figure, the area of the ΔOAB is :

(a) 4 sq. units   (b) 8 sq. units

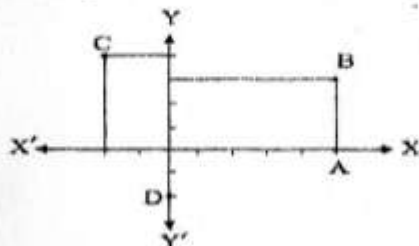(c) 2 sq. units   (d) none of these
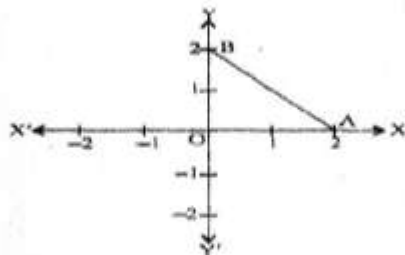
Section - B

16. Draw the lines X'OX and YOY1 as the axes on the plane of a paper and plot the given points.

(i) A(5,3) (ii) B (-3, 2) (iii) C(-5, -4) (iv) D(2,-6)

Q.17. what is the perpendicular distance of the points A (7, − 4) from (i) x-axis (ii) y-axis?

Q.18. Write the co-ordinates of A, B, C and D from given the figure.

Q.19. A point lies on x-axis at a distance of 9 units from y-axis. What are its coordinates? What will be its coordinates if it lies on y-axis at a distance of − 9 units from x-axis?

Q.20. In the figure, if ΔABC and ΔABD are equilateral, then find the co-ordinates of points C and D.
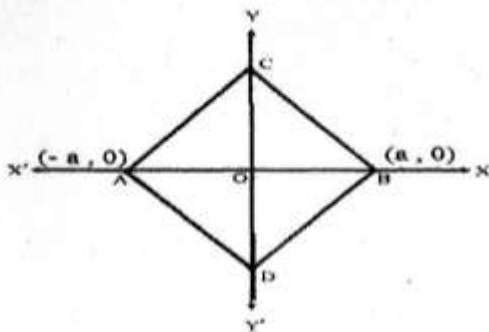
Section – C

Q. 21. Plot the points A (3, 0), B (3, 3) and C (0, 3) in a Cartesian plane. Join OA, AB, BC and CO. Name the figure so formed and write its one property.

Q.22. Plot the points (2, 3), (−2, 3), (−2, −3) and (2, −3) on a graph sheet. Join these points. Name the figure obtained. Also, find the area of the figure so obtained.

Q.23. In the figure, DABC is an equilateral triangle with coordinates of vertices B and C as (−4, 0) and (4, 0) respectively. Find the coordinates of the point A.
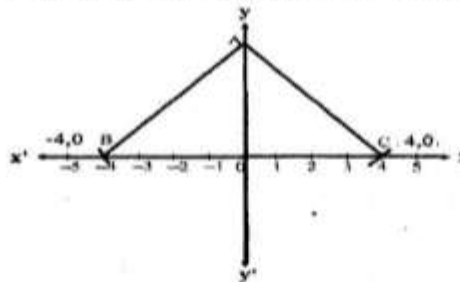
Q.24. Three vertices of a rectangle are (− 4, 5), (− 4, 2) and (3, 2). Plot these points and find the co-ordinates of the fourth vertex.

25. Find the mirror images of the following point using x-axis & y-axis as mirror.

(i) A(2,3)   (ii) B(2,-3)   (iii) C(-2,3)   (iv) D(-2,-3)

Q.26 Draw the graph of the following equations

(i) y = 3x + 2 (ii) y = x (iii) y = 4x

Q.27. Draw a triangle with vertices O(0,0) A(3,0) B(3,4). Classify the triangle and also find its area.

Q.28. Draw a quadrilateral with vertices A(2,2) B(2,-2) C(-2,-2), D(-2,2). Classify the quadrilateral and also find its area.

Q.29. Find the coordinates of point which are equidistant from these two points P(3,0) and Q(-3,0). How many points are possible satisfying this condition?

Q. 30. A square ABCD of side 2a is plotted on Cartesian plane. Find the co-ordinates of the vertices of the square:

(i) Taking AB and AD as axes.

(ii) Taking the centre of the square as origin and axes parallel to the sides AB and AD.