Chapter - 3

(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 System

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

In this 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

\((a,b) \neq (b,a)\)
Thus (2,3) is one ordered pair and (3,2) is another ordered pair.

In given figure O is called origin.

The horizontal line \( X^1OX \) is called the X-axis.

The vertical line \( YOY' \) is called the Y-axis.

\( P(a,b) \) be any point in the plane. 'a' the first number denotes the distance of point from Y-axis and 'b' the second number denotes the distance of point from X-axis.

\( a \) - X - coordinate | abscissa of \( P \).

\( b \) - Y - coordinate | ordinate of \( P \).

The coordinates of origin are (0,0)

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

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

Note : Any point lying on \( x - axis \) or Y-axis does not lie in any quadrant.

**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 $(a,b)$ 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 $(4,3)$ 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 O(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

**Section - B**

Q.9 Write down the coordinates of each of the points P, Q, R, S and T as shown in the following figure?
Q.10 Draw the lines X'OX and YOY 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)

Section - C

Q.11 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.12 Draw the graph of the following equations

(i) $y = 3x + 2$   (ii) $y = x$

Q.13 Draw a triangle with vertices 0(0,0) A(3,0) B(3,4). Classify the triangle and also find its area.

Q.14 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.15 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?
Answers

Q.1  (i) (7,0) X-axis  (ii) (0, -3) Y-axis  (iii) (0,6) Y-axis  (iv) (-5,0) X-axis

Q.2  (i) (4,-2) IV quadrant  (ii) (-3,7) II quadrant  (iii) (-1,-2) III quadrant
     (iv) (3,6) I quadrant.

Q.3  P(3,2) and Q(2,3) do not represent same point.

Q.4  These points do not lie in any quadrant. These points lie on the axes.

Q.5  (c) quadrant III  Q.6 (c) quadrant I & III

Q.7  (a) 3 units  Q.8 (b) 12 sq. units.

Q.11 A\( ^1 \) (-2,-3), B\( ^1 \) (2,3), C\( ^1 \) (-2,-3), D\( ^1 \) (-2,3)

Q.13  right angle triangle area - 6 square units.

Q.14  quadrilateral is square area -16 square units.

Q.15  Every point on Y-axis satisfy this condition.