Chapter - 3

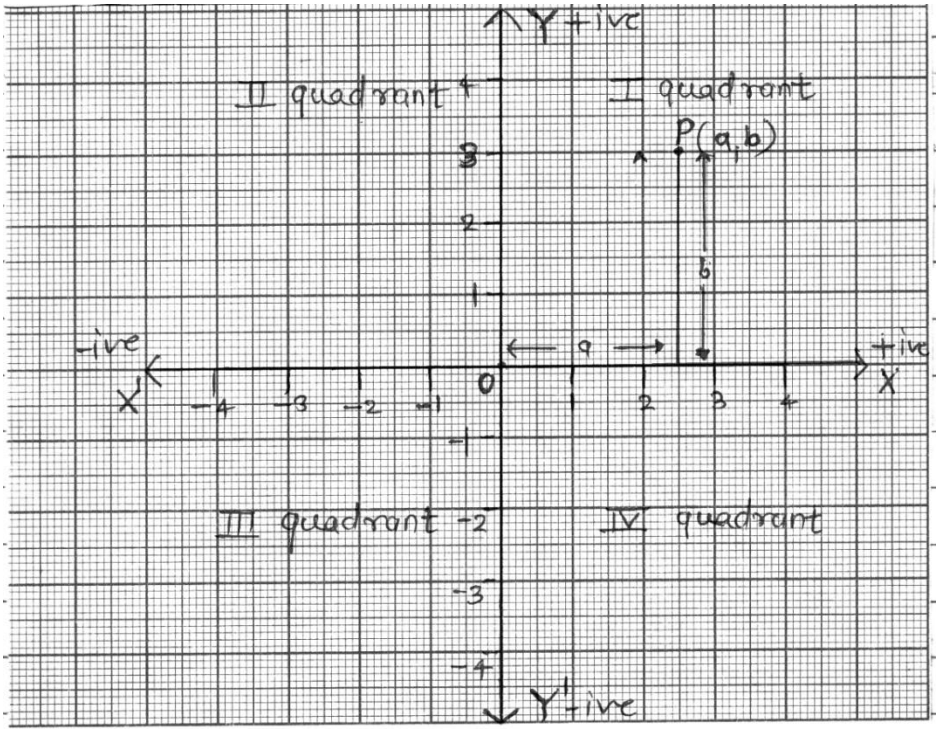
(Coordinate Geometry)

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.

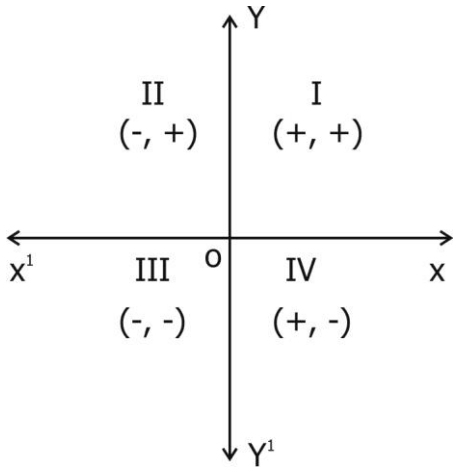
a - X - coordinate | abscissa of P.

b - Y - coordinate | ordinate of P.

The coordinates of origin are (0,0)

Every point on the x-axis is at a distance o 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 <u>not lie in any quadrant</u>.

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

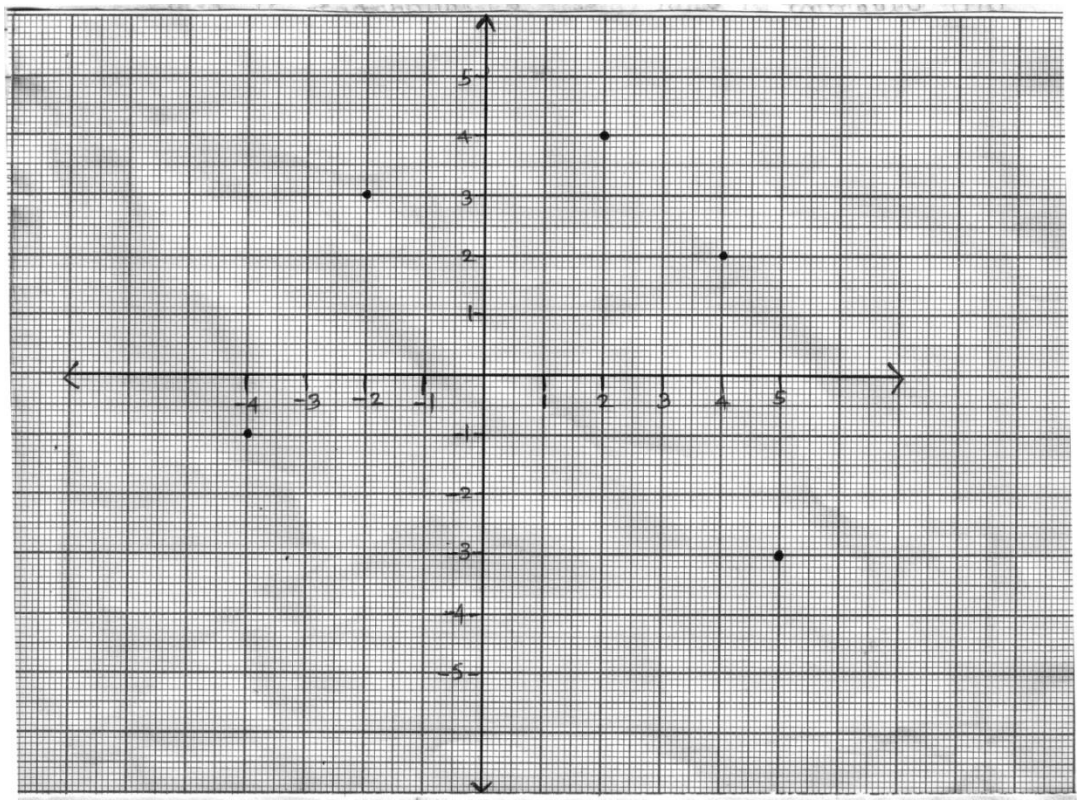
(a) 3 Units (b) 4 Units (c) 5 Units (d) 7 Units

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

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[1] 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.