



Co-Ordinate Geometry Ex 14.2 Q18

Answer :

If (x_1, y_1) and (x_2, y_2) are given as two points, then the co-ordinates of the midpoint of the line joining these two points is given as

$$(x_m, y_m) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

It is given that the point 'P' has co-ordinates $(-3, 2)$

Here we are asked to find out the co-ordinates of point 'Q' which lies along the line joining the origin and point 'P'. Thus we can see that the points 'P', 'Q' and the origin are collinear.

Let the point 'Q' be represented by the point (x, y)

Further it is given that the $OP = OQ$

This implies that the origin is the midpoint of the line joining the points 'P' and 'Q'.

So we have that $(x_m, y_m) = (0, 0)$

Substituting the values in the earlier mentioned formula we get,

$$(x_m, y_m) = \left(\frac{-3 + x}{2}, \frac{2 + y}{2} \right)$$

$$(0, 0) = \left(\frac{-3 + x}{2}, \frac{2 + y}{2} \right)$$

Equating individually we have, $x = 3$ and $y = -2$.

Thus the co-ordinates of the point 'Q' is $(3, -2)$

Co-Ordinate Geometry Ex 14.2 Q19

Answer :

The distance d between two points (x_1, y_1) and (x_2, y_2) is given by the formula

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Here we are to find out a point on the y -axis which is equidistant from both the points A $(2, 3)$ and B $(-4, 1)$.

Let this point be denoted as $C(x, y)$.

Since the point lies on the y -axis the value of its ordinate will be 0. Or in other words we have $x = 0$.

Now let us find out the distances from 'A' and 'B' to 'C'

$$AC = \sqrt{(2 - x)^2 + (3 - y)^2}$$

$$= \sqrt{(2 - 0)^2 + (3 - y)^2}$$

$$AC = \sqrt{(2)^2 + (3 - y)^2}$$

$$BC = \sqrt{(-4 - x)^2 + (1 - y)^2}$$

$$= \sqrt{(-4 - 0)^2 + (1 - y)^2}$$

$$BC = \sqrt{(-4)^2 + (1 - y)^2}$$

We know that both these distances are the same. So equating both these we get,

$$AC = BC$$

$$\sqrt{(2)^2 + (3 - y)^2} = \sqrt{(-4)^2 + (1 - y)^2}$$

Squaring on both sides we have,

$$(2)^2 + (3 - y)^2 = (-4)^2 + (1 - y)^2$$

$$4 + 9 + y^2 - 6y = 16 + 1 + y^2 - 2y$$

$$4y = -4$$

$$y = -1$$

Hence the point on the y -axis which lies at equal distances from the mentioned points is $(0, -1)$.

Co-Ordinate Geometry Ex 14.2 Q20

Answer :

If three consecutive points of a parallelogram are given as (x_1, y_1) , (x_2, y_2) and (x_3, y_3) then the co-ordinates of the fourth vertex is given as,

$$(x_4, y_4) = (x_1 + x_3 - x_2, y_1 + y_3 - y_2)$$

Here the three given points of the parallelogram are (3, 4), (3, 8) and (9, 8)

If we had to represent the points on the graph we can see that these points are consecutive and hence we can use the earlier mentioned formula to arrive at the co-ordinates of the fourth vertex of the parallelogram.

Substituting the respective values we have,

$$(x_4, y_4) = (3 + 9 - 3, 4 + 8 - 8)$$

$$(x_4, y_4) = (9, 4)$$

Hence the co-ordinates of the fourth vertex of the parallelogram is $(9, 4)$

***** END *****