



Co-Ordinate Geometry Ex 14.3 Q25

Answer :

Let ABCD be a parallelogram in which the co-ordinates of the vertices are A (1, -2); B (3, 6) and C(5, 10). We have to find the co-ordinates of the forth vertex.

Let the forth vertex be D(x, y)

Since ABCD is a parallelogram, the diagonals bisect each other. Therefore the mid-point of the diagonals of the parallelogram will coincide.

Now to find the mid-point P(x, y) of two points A(x₁, y₁) and B(x₂, y₂) we use section formula as,

$$P(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

The mid-point of the diagonals of the parallelogram will coincide.

So,

Co-ordinate of mid-point of AC = Co-ordinate of mid-point of BD

Therefore,

$$\left(\frac{5+1}{2}, \frac{10-2}{2} \right) = \left(\frac{x+3}{2}, \frac{y+6}{2} \right)$$

$$\left(\frac{x+3}{2}, \frac{y+6}{2} \right) = (3, 4)$$

Now equate the individual terms to get the unknown value. So,

$$\frac{x+3}{2} = 3$$

$$x = 3$$

Similarly,

$$\frac{y+6}{2} = 4$$

$$y = 2$$

So the forth vertex is **D(3, 2)**

Co-Ordinate Geometry Ex 14.3 Q26

Answer :

Let ABCD be a parallelogram in which the co-ordinates of the vertices are A (a, -11); B (5, b); C (2, 15) and D (1, 1).

Since ABCD is a parallelogram, the diagonals bisect each other. Therefore the mid-point of the diagonals of the parallelogram will coincide.

In general to find the mid-point P(x, y) of two points A(x₁, y₁) and B(x₂, y₂) we use section formula as,

$$P(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

The mid-point of the diagonals of the parallelogram will coincide.

So,

Co-ordinate of mid-point of AC = Co-ordinate of mid-point of BD

Therefore,

$$\left(\frac{a+2}{2}, \frac{15-11}{2} \right) = \left(\frac{5+1}{2}, \frac{b+1}{2} \right)$$

Now equate the individual terms to get the unknown value. So,

$$\frac{a+2}{2} = 3$$

$$a = 4$$

Similarly,

$$\frac{b+1}{2} = 2$$

$$b = 3$$

Therefore,

$$\boxed{\begin{array}{l} a = 4 \\ b = 3 \end{array}}$$

***** END *****