



Co-Ordinate Geometry Ex 14.3 Q44

Answer :

The ratio in which the y-axis divides two points (x_1, y_1) and (x_2, y_2) is $-x_1 : x_2$

The co-ordinates of the point dividing two points (x_1, y_1) and (x_2, y_2) in the ratio $m : n$ is given as,

$$(x, y) = \left(\left(\frac{\lambda x_2 + x_1}{\lambda + 1} \right), \left(\frac{\lambda y_2 + y_1}{\lambda + 1} \right) \right) \text{ where, } \lambda = \frac{m}{n}$$

Here the two given points are $A(5, -6)$ and $B(-1, -4)$.

By the earlier mentioned statement we can say that the y-axis divides the two mentioned points in the ratio

$$-x_1 : x_2$$

$$-5 : -1$$

$$5 : 1$$

Thus the given points are divided by the y-axis in the ratio $\boxed{5 : 1}$.

The co-ordinates of this point (x, y) can be found by using the earlier mentioned formula.

$$(x, y) = \left(\left(\frac{\frac{5}{1}(-1) + (5)}{\frac{5}{1} + 1} \right), \left(\frac{\frac{5}{1}(-4) + (-6)}{\frac{5}{1} + 1} \right) \right)$$

$$(x, y) = \left(\left(\frac{0}{6} \right), \left(-\frac{26}{6} \right) \right)$$

$$(x, y) = \left(0, -\frac{26}{6} \right)$$

Thus the co-ordinates of the point which divides the given points in the required ratio are $\boxed{\left(0, -\frac{26}{6} \right)}$.

Co-Ordinate Geometry Ex 14.3 Q45

Answer :

Let ABCD be a parallelogram in which the co-ordinates of the vertices are A (6, 1); B (8, 2); C (9, 4) and D (k, p).

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 $A(x_1, y_1)$ and $B(x_2, y_2)$ 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,

$$\left(\frac{6+9}{2}, \frac{4+1}{2} \right) = \left(\frac{k+8}{2}, \frac{p+2}{2} \right)$$

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

$$\frac{k+8}{2} = \frac{15}{2}$$

$$k = 7$$

Similarly,

$$\frac{p+2}{2} = \frac{5}{2}$$

$$p = 3$$

Therefore,

$$\boxed{\begin{matrix} k = 7 \\ p = 3 \end{matrix}}$$

Co-Ordinate Geometry Ex 14.3 Q46

Answer :

The co-ordinates of a point which divided two points (x_1, y_1) and (x_2, y_2) internally in the ratio $m : n$ is given by the formula,

$$(x, y) = \left(\left(\frac{mx_2 + nx_1}{m+n} \right), \left(\frac{my_2 + ny_1}{m+n} \right) \right)$$

Here it is said that the point $(-4, 6)$ divides the points $A(-6, 10)$ and $B(3, -8)$. Substituting these values in the above formula we have,

$$(-4, 6) = \left(\left(\frac{m(3) + n(-6)}{m+n} \right), \left(\frac{m(-8) + n(10)}{m+n} \right) \right)$$

Equating the individual components we have,

$$-4 = \frac{m(3) + n(-6)}{m+n}$$

$$-4m - 4n = 3m - 6n$$

$$7m = 2n$$

$$\frac{m}{n} = \frac{2}{7}$$

Therefore the ratio in which the line is divided is 2:7

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