

Coordinate Geometry

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10th Maths - Chapter 7

This is Problem-4 from Exercise 7.2

1. Find the ratio in which the line segment joining the points $(-3, 10)$ and $(6, -8)$ is divided by $(-1, 6)$.

Solution:

Given Data:

$$\mathbf{A} = \begin{pmatrix} -3 \\ 10 \end{pmatrix} \quad (1)$$

$$\mathbf{B} = \begin{pmatrix} 6 \\ -8 \end{pmatrix} \quad (2)$$

$$\mathbf{C} = \begin{pmatrix} -1 \\ 6 \end{pmatrix} \quad (3)$$

(4)

To find: ratio dividing them

Now,

$$\mathbf{C} = \frac{\mathbf{A} + n\mathbf{B}}{n + 1} \quad (5)$$

$$\mathbf{C} = \frac{1}{1 + n} \times \left(\begin{pmatrix} -3 \\ 10 \end{pmatrix} + n \times \begin{pmatrix} 6 \\ -8 \end{pmatrix} \right) \quad (6)$$

$$= \frac{1}{1 + n} \times \begin{pmatrix} -3 + 6n \\ 10 - 8n \end{pmatrix} \quad (7)$$

By taking x

$$-1 = \frac{-3 + 6n}{1 + n} \quad (8)$$

$$\Rightarrow -3 + 6n = -1 - n \quad (9)$$

$$\Rightarrow 6n + n = -1 + 3 \quad (10)$$

$$\Rightarrow 7n = 2 \quad (11)$$

$$\Rightarrow n = \frac{2}{7} \quad (12)$$

now, by taking y

$$6 = \frac{10 - 8n}{n + 1} \quad (13)$$

$$\Rightarrow 10 - 8n = 6 + 6n \quad (14)$$

$$\Rightarrow 10 - 6 = 6n + 8n \quad (15)$$

$$\Rightarrow 4 = 14n \quad (16)$$

$$\Rightarrow n = \frac{2}{7} \quad (17)$$

Therefore, the ratio which divides A and B is 2:7.

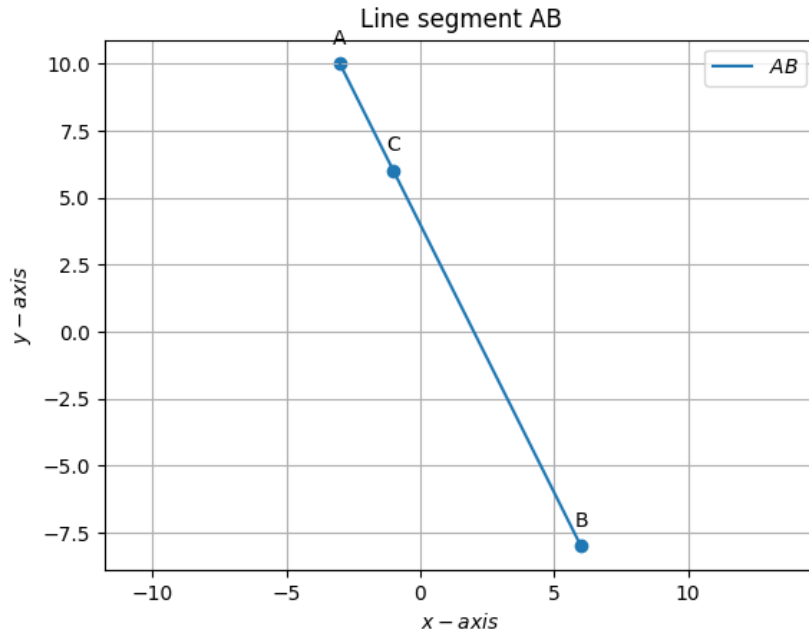


Figure 1: Line segment AB