1.5.21

EE25BTECH11033 - Kavin

Question:
Find the ratio in which $\mathbf{P}(4, m)$ divides the line segment joining the points $\mathbf{A}(2, 3)$ and $\mathbf{B}(6, -3)$. Hence, find m.

Solution:
Let the ratio in which P divides the line AB be $k : 1$.
Using section formula,

$$\begin{pmatrix} 4 \\ m \end{pmatrix} = \frac{\begin{pmatrix} 2 \\ 3 \end{pmatrix} + k\begin{pmatrix} 6 \\ -3 \end{pmatrix}}{1+k} \tag{1}$$

$$\implies \begin{pmatrix} 4 \\ m \end{pmatrix} + k\begin{pmatrix} 4 \\ m \end{pmatrix} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} + k\begin{pmatrix} 6 \\ -3 \end{pmatrix} \tag{2}$$

$$\implies k\begin{pmatrix} 2 \\ -3-m \end{pmatrix} = \begin{pmatrix} 2 \\ m-3 \end{pmatrix} \tag{3}$$

$$\text{or, } k = \frac{1}{1}. \tag{4}$$

$$\implies m = 0. \tag{5}$$

See Fig. 0 ,

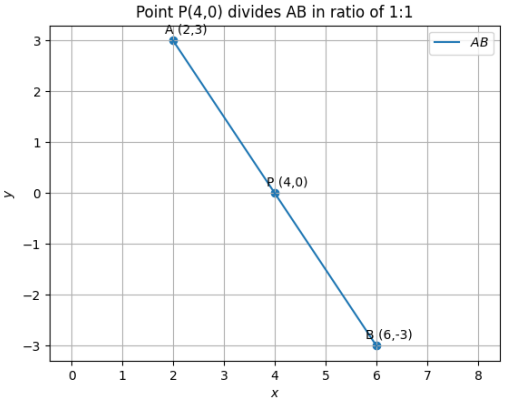

Fig. 0