

1.5.29

EE25BTECH11042 - Nipun Dasari

Question:

The coordinates of the point P dividing the line segment joining the points A (1, 3) and B (4, 6), in the ratio 2 : 1 are

Solution:

According to the question,

Consider the coordinate as following vectors

Given the points A and B

$$\mathbf{A} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$$

The formula for internal division of vectors is where P divides A and B in the ratio k:1

$$\mathbf{P} = \frac{k\mathbf{B} + \mathbf{A}}{1 + k}$$

Thus by formula

$$\mathbf{P} = \frac{1}{1+2} \left(\begin{pmatrix} 1 \\ 3 \end{pmatrix} + 2 \begin{pmatrix} 4 \\ 6 \end{pmatrix} \right)$$

$$\mathbf{P} = \frac{1}{3} \left(\begin{pmatrix} 1 \\ 3 \end{pmatrix} + \begin{pmatrix} 8 \\ 12 \end{pmatrix} \right)$$

$$\mathbf{P} = \frac{1}{3} \begin{pmatrix} 9 \\ 15 \end{pmatrix}$$

$$\therefore \mathbf{P} = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$$

