

1-1.5-27

AI24BTECH11002 - K.AKSHAY TEJA

Question:

If the coordinates of points **A** and **B** are $(-2, -2)$ and $(2, -4)$ respectively, find the coordinates of **P** such that $AP = \frac{3}{7}AB$, and **P** lies on the line segment AB .

(10, 2015)

Solution:

| Point | x-coordinate | y-coordinate |
|-------|--------------|--------------|
| A | -2 | -2 |
| B | 2 | -4 |

TABLE 0: Coordinates of points A and B

Given, $AP = \frac{3}{7}AB$. That means P divides AB in ratio 3:4

Using section formula,

$$\mathbf{P} = \frac{\mathbf{A} + k\mathbf{B}}{1 + k} \quad (0.1)$$

$$\mathbf{P} = \frac{1}{1 + \frac{3}{4}} \left(\begin{pmatrix} -2 \\ -2 \end{pmatrix} + \frac{3}{4} \begin{pmatrix} 2 \\ -4 \end{pmatrix} \right) \quad (0.2)$$

$$= \begin{pmatrix} -\frac{2}{7} \\ -\frac{20}{7} \end{pmatrix} \quad (0.3)$$

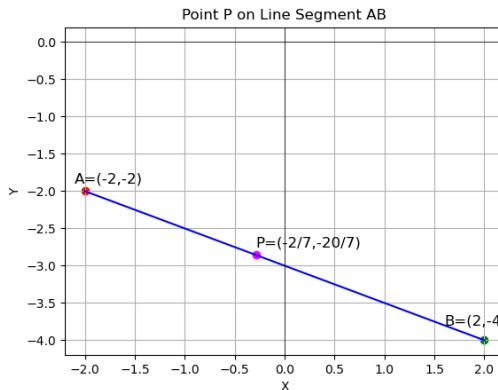


Fig. 0.1: Plot of points A,B and P