1.1.4.10

EE24BTECH11032 - John Bobby

Question: If $\mathbf{P}(9a-2,-b)$ divides the line segment joining $\mathbf{A}(3a+1,-3)$ and $\mathbf{B}(8a,5)$ in the ratio $3:1$, find the values of a and b.

Solution: As P lies between A and B, P can be represented as

$$P = \frac{kB + A}{k+1} \tag{0.1}$$

(0.2)

where k is the ratio,here k=3

$$P = \frac{3B + A}{4} = \frac{3\begin{pmatrix}8a\\5\end{pmatrix} + \begin{pmatrix}3a+1\\-3\end{pmatrix}}{4} = \frac{\begin{pmatrix}27a+1\\12\end{pmatrix}}{4} \tag{0.3}$$

$$P = \begin{pmatrix}9a-2\\-b\end{pmatrix} \tag{0.4}$$

(0.5)

on equating both sides
$a = 1$ and $b = -3$

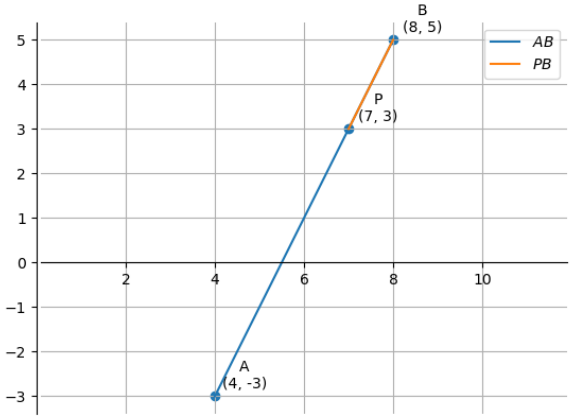

Fig. 0.1: Plot of points **A**, **B** and **P**