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

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

where k is the ratio,here k=3 (0.2)

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

also, (0.4)

$$P = \begin{pmatrix}9a-2\\-b\end{pmatrix} \tag{0.5}$$

on equating both sides (0.6)

a=1, b=-3 (0.7)

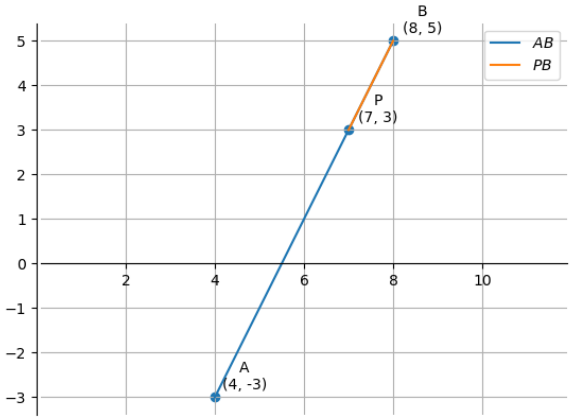

Fig. 0.1: Plot of points **A**, **B** and **P**