

1.1.4.10

EE24BTECH11032 - John Bobby

Question: If $P(9a - 2, -b)$ divides the line segment joining $A(3a + 1, -3)$ and $B(8a, 5)$ 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

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

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

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

also, (0.4)

$$P = \begin{pmatrix} 9a - 2 \\ -b \end{pmatrix} \quad (0.5)$$

on equating both sides (0.6)

$a=1, b=-3$ (0.7)

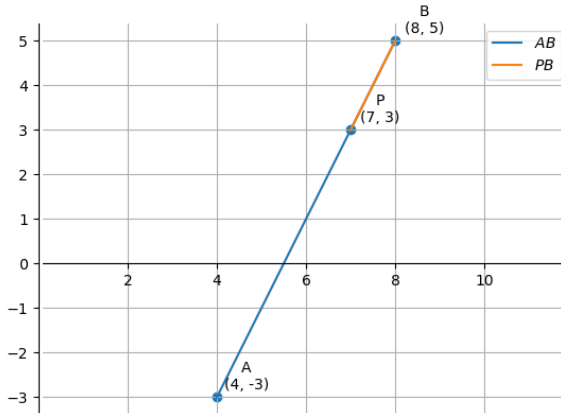


Fig. 0.1: Plot of points **A**, **B** and **P**