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

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

where k is the ratio, here k=3

$$P = \frac{3B + A}{4} \tag{0.2}$$

$$= \frac{3\binom{8a}{5} + \binom{3a+1}{-3}}{4} = \frac{\binom{27a+1}{12}}{4}$$

$$P = \binom{9a-2}{-b}$$
(0.3)

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

on equating both sides

$$a = 1 \tag{0.5}$$

$$b = -3 \tag{0.6}$$

1

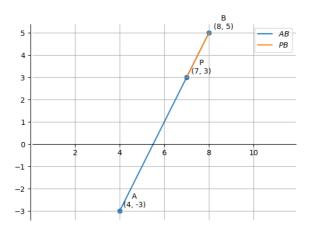


Fig. 0.1: Plot of points A, B and P