

# ASSIGNMENT-1

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**Question:** Calculate the ratio in which the line joining  $A = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$  and  $B = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$  is divided by the point  $P = \begin{pmatrix} x^* \\ 3 \end{pmatrix}$ . Also find

- 1)  $x^*$
- 2) Length of  $\overrightarrow{AP}$

**Solution:** The ratio in which the line is divided by the point is 1:3.

- 1) Now let's find the point  $P = \begin{pmatrix} x^* \\ 3 \end{pmatrix}$  by using the section formula

$$P = \frac{(1 * 3) + (3 * (-4))}{1 + 3}, \frac{(1 * 6) + (3 * 2)}{1 + 3} \quad (0.0.1)$$

$$= \frac{-9}{4}, \frac{12}{4} \quad (0.0.2)$$

$$= (-2.25, 3) \quad (0.0.3)$$

Therefore, the value of  $x^* = -2.25$ .

- 2) The length of the line  $\overrightarrow{AP}$  can be measured by the distance formula.

$$length = \sqrt{(-4 - (-2.25))^2 + (2 - 3)^2} \quad (0.0.4)$$

$$= 2.015 \quad (0.0.5)$$

The length of the line  $\overrightarrow{AP} = 2.015$ (Approx).

