

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 form the line equation which is

$$\begin{pmatrix} -4 & 7 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = 30 \quad (0.0.1)$$

Now by solving this equation for the point $P = (x^*, 3)$. We get,

$$\begin{pmatrix} -4 & 7 \end{pmatrix} \begin{pmatrix} x^* \\ 3 \end{pmatrix} = 30 \quad (0.0.2)$$

Solving this we get the value of $x^* = -9/4$ (or) -2.25

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

$$\sqrt{(-4 - (-2.25))^2 + (2 - 3)^2}$$

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

