ASSIGNMENT-1

Nwjwr Khungur Brahma

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

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

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

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

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

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

