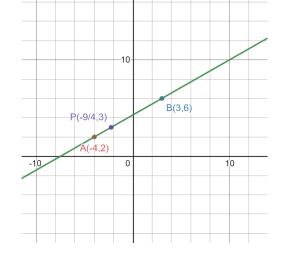# ASSIGNMENT-1

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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 find the point $\mathbf{P}= \begin{pmatrix} x* \\ 3 \end{pmatrix}$ by using the section formula

$$\mathbf{P} = \frac{(1 \times \mathbf{B}) + (3 \times \mathbf{A})}{1+3} \tag{0.0.1}$$

$$= \frac{(1 \times \begin{pmatrix} -4 \\ 2 \end{pmatrix}) + (3 \times \begin{pmatrix} 3 \\ 6 \end{pmatrix})}{1+3} \tag{0.0.2}$$

$$= \frac{(1 \times 3) + (3 \times (-4))}{1+3}, \frac{(1 \times 6) + (3 \times 2)}{1+3} \tag{0.0.3}$$

$$= \frac{-9}{4}, \frac{12}{4} \tag{0.0.4}$$

$$= (-2.25, 3) \tag{0.0.5}$$

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

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

$$length = \sqrt[2]{(-4 - (-2.25))^2 + (2-3)^2} \tag{0.0.6}$$

$$= 2.015 \tag{0.0.7}$$

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