VECTORS

1 10^{th} Maths - EXERCISE-7.2

1. If A and B are (–2, –2) and (2, –4), respectively, find the coordinates of P such that $AP = \frac{3}{7}AB$ and P lies on the line segment AB.

2 SOLUTION

Given points are

$$\mathbf{A} = \begin{pmatrix} -2 \\ -2 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 2 \\ -4 \end{pmatrix} \tag{1}$$

The equation of the formula is

$$\mathbf{P} = \frac{\mathbf{A} + n\mathbf{B}}{1+n} \tag{2}$$

Ratio 3:4 has taken

$$n = \frac{3}{4} \tag{3}$$

$$\mathbf{P} = \frac{1}{1+\frac{3}{4}}\left(\begin{pmatrix} -2 \\ -2 \end{pmatrix} + \frac{3}{4}\begin{pmatrix} 2 \\ -4 \end{pmatrix}\right) \tag{4}$$

$$= \frac{1}{\frac{7}{4}}\left(\begin{pmatrix} -2 \\ -2 \end{pmatrix} + \begin{pmatrix} \frac{6}{4} \\ \frac{-12}{4} \end{pmatrix}\right) \tag{5}$$

$$= \frac{1}{\frac{7}{4}}\left(\begin{pmatrix} \frac{-2}{4} \\ \frac{-20}{4} \end{pmatrix}\right) \tag{6}$$

$$\mathbf{P} = \begin{pmatrix} \frac{-2}{7} \\ \frac{-20}{7} \end{pmatrix} \tag{7}$$

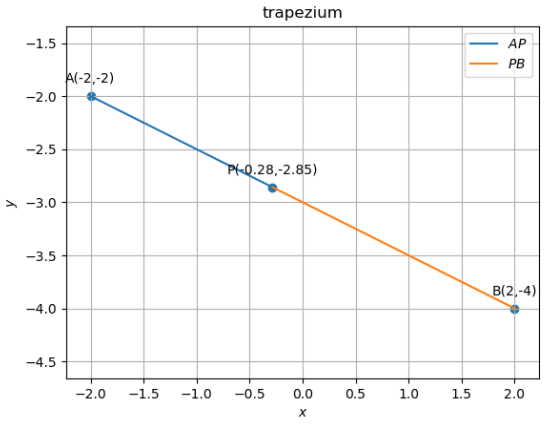

Figure 1