Coordinate-Geomentry

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10^{th} Maths - Chapter 7

This is Problem-8 from Exercise 7.2

1. if **A** and **B** are$\begin{pmatrix}-2\\-2\end{pmatrix}$ and $\begin{pmatrix}2\\-4\end{pmatrix}$,respectively,find the coordinates of **P** such that **AP**=$\frac{3}{7}$**AB** and **P** lies on the segment **AB**

Solution:
Given,
A=$\begin{pmatrix}-2\\-2\end{pmatrix}$, **B**=$\begin{pmatrix}2\\-4\end{pmatrix}$, $m_1 : m_2 = 3 : 4$

$$\mathbf{P} = \frac{m_1 B + m_2 A}{m_1 + m_2} \tag{1}$$

$$\mathbf{P} = \frac{3\begin{pmatrix}2\\-4\end{pmatrix} + 4\begin{pmatrix}-2\\-2\end{pmatrix}}{3+4} \tag{2}$$

$$\mathbf{P} = \frac{\begin{pmatrix}6-8\\-12-8\end{pmatrix}}{3+4} \tag{3}$$

$$\mathbf{P} = \begin{pmatrix}\frac{6-8}{3+4}\\\frac{-12-8}{3+4}\end{pmatrix} \tag{4}$$

$$\mathbf{P} = \begin{pmatrix}\frac{-2}{7}\\\frac{-20}{7}\end{pmatrix} \tag{5}$$

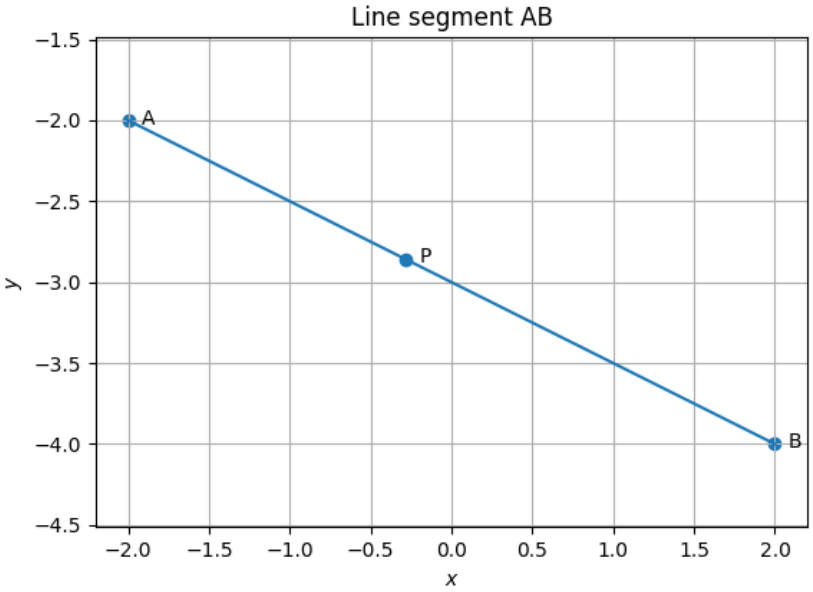

Figure 1: Line segment AB