

Coordinate-Geometry

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August 4, 2023

10th 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 $\mathbf{AP} = \frac{3}{7}\mathbf{AB}$ and **P** lies on the segment **AB**

Solution:

Given,

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

$$\mathbf{P} = \frac{m_1 \mathbf{B} + m_2 \mathbf{A}}{m_1 + m_2} \quad (1)$$

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

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

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

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