

Coordinate-Geometry

Paidisetty Rithik(paidisettyrithik@sriprakashschools.com)

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

Solution:

Given,

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

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

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

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

$$P(x) = \frac{6 - 8}{3 + 4} = \frac{-2}{7} \quad (4)$$

$$P(y) = \frac{-12 - 8}{3 + 4} = \frac{-20}{7} \quad (5)$$

Therefore the coordinates of P are $\frac{-2}{7}, \frac{-20}{7}$