Linear equation in two variables

potnuru deekshitha (potnurudeekshitha@sriprakashschools.com)

August 7, 2023

10th Maths - Chapter 7

This is Problem-2 from Exercise 7.2

1. Find the coordinates of the point of trisection joining (4,-1),(-2,-3)

   Solution:
   Case-1
   $\mathbf{A} = \begin{pmatrix} 4 \\ -2 \end{pmatrix}$, $\mathbf{B} = \begin{pmatrix} 1 \\ -3 \end{pmatrix}$, $m_1 : m_2 = 2 : 1$

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

$$P = \frac{2 \begin{pmatrix} 4 \\ -2 \end{pmatrix} + 1 \begin{pmatrix} -2 \\ -3 \end{pmatrix}}{2 + 1} \tag{2}$$

$$P = \frac{\begin{pmatrix} 8 - 2 \\ -4 - 3 \end{pmatrix}}{2 + 1} \tag{3}$$

$$P = \begin{pmatrix} \frac{8-2}{2+1} \\ \frac{-4-3}{2+1} \end{pmatrix} \tag{4}$$

$$P = \begin{pmatrix} \frac{6}{3} \\ \frac{-7}{3} \end{pmatrix} \tag{5}$$

$$P = \begin{pmatrix} 2 \\ \frac{-7}{3} \end{pmatrix} \tag{6}$$

$$\tag{7}$$

Case-2
$$\mathbf{A}=\begin{pmatrix} 4 \\ -2 \end{pmatrix}, \; \mathbf{B}=\begin{pmatrix} 1 \\ -3 \end{pmatrix}, \; m_1 : m_2 = 1 : 2$$

$$P = \frac{m_1 B + m_2 A}{m_1 + m_2} \tag{8}$$

$$P = \frac{1 \begin{pmatrix} 4 \\ -2 \end{pmatrix} + 2 \begin{pmatrix} -2 \\ -3 \end{pmatrix}}{1 + 2} \tag{9}$$

$$P = \frac{\begin{pmatrix} 4 - 4 \\ -2 - 6 \end{pmatrix}}{1 + 2} \tag{10}$$

$$P = \begin{pmatrix} \frac{4-4}{1+2} \\ \frac{-2-6}{1+2} \end{pmatrix} \tag{11}$$

$$P = \begin{pmatrix} \frac{0}{3} \\ \frac{-8}{3} \end{pmatrix} \tag{12}$$

$$P = \begin{pmatrix} 0 \\ \frac{-8}{3} \end{pmatrix} \tag{13}$$

$$\tag{14}$$