Linear Equation In Two Variables

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Class 10th Maths - Chapter 3

This is Problem-1(ii) from Exercise 3.3

x–y=3 , 2x–3y=36

Solution:

Given Data: x–y=3 , 2x–3y=36

This can also be written as:

$$\mathbf{AX} = \mathbf{B} \tag{1}$$

Where, A= $\begin{pmatrix} 1 & -1 \\ 2 & 3 \end{pmatrix}$ X= $\begin{pmatrix} x \\ y \end{pmatrix}$ B = $\begin{pmatrix} 3 \\ 36 \end{pmatrix}$

A = a1+a2

a1 = $\begin{pmatrix} 1 \\ 2 \end{pmatrix}$ a2 = $\begin{pmatrix} -1 \\ 3 \end{pmatrix}$

$$\tag{2}$$

$$x = \frac{\begin{vmatrix} b & a2 \end{vmatrix}}{\begin{vmatrix} a1 & a2 \end{vmatrix}} = \frac{\begin{vmatrix} 3 & -1 \\ 36 & 3 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix}} \tag{3}$$

$$(4)$$

$$y = \frac{\begin{vmatrix} a1 & b \end{vmatrix}}{\begin{vmatrix} a1 & a2 \end{vmatrix}} = \frac{\begin{vmatrix} 1 & 3 \\ 2 & 36 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 2 & 3 \end{vmatrix}} \tag{5}$$

$$(6)$$

$$x = \frac{\begin{vmatrix} 9 & -(-36) \end{vmatrix}}{\begin{vmatrix} 3 & -(-2) \end{vmatrix}} \tag{7}$$

$$y = \frac{\begin{vmatrix} 36 & -6 \end{vmatrix}}{\begin{vmatrix} 3 & -(-2) \end{vmatrix}} \tag{8}$$

$$(9)$$

$$x = \frac{45}{5} = 9 \tag{10}$$

$$y = \frac{30}{5} = 6 \tag{11}$$