Chapter Name

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Class No10th Maths - Chapter 3

This is Problem-4.3 from Exercise 3.2

1. which one of the following equations are consistent?if so, represent them algebrically and graphically

$$x - y = 8 \tag{1}$$
$$3x - 3y = 16 \tag{2}$$

Solution:

$$\begin{pmatrix} 1 & -1 \\ 3 & -3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 8 \\ 16 \end{pmatrix} \tag{3}$$

$$x = \frac{\begin{vmatrix} \mathbf{b} & \mathbf{a_2} \end{vmatrix}}{\begin{vmatrix} \mathbf{a_1} & \mathbf{a_2} \end{vmatrix}} = \frac{\begin{vmatrix} 8 & -1 \\ 16 & -3 \end{vmatrix}}{\begin{vmatrix} 1 & -1 \\ 3 & -3 \end{vmatrix}} = \frac{-24 - (-16)}{(-3) - (-3)} = \frac{-8}{0} = 0 \tag{4}$$

$$y = \frac{\begin{vmatrix} \mathbf{a_1} & \mathbf{b} \end{vmatrix}}{\begin{vmatrix} \mathbf{a_1} & \mathbf{a_2} \end{vmatrix}} = \frac{\begin{vmatrix} 1 & 8 \\ 3 & 16 \end{vmatrix}}{\begin{vmatrix} 0 \end{vmatrix}} = \frac{16 - (+16)}{(-3) - (-3)} \frac{16 - 16}{-3 + 3} = 0/0 = 0 \tag{5}$$

$$we can say the equations are not consistent \tag{6}$$