Linear equations in two variables

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10th Maths - Chapter 3

This is Problem-4.3 from Exercise 3.2

1. Which of the following pairs of linear equations are consistent,or inconsistent.If consistent,obtain the solution graphically.

$$2x + y = 6 \tag{1}$$
$$2x - y = 2 \tag{2}$$
$$\tag{3}$$

Solution:

Matrix form of the equations: $\begin{pmatrix} 2 & 1 & 6 \\ 2 & -1 & 2 \end{pmatrix}$

$R_1 = \begin{pmatrix} 2 & 1 & 6 \end{pmatrix}, R_2 = \begin{pmatrix} 2 & -1 & 2 \end{pmatrix}$

$R_2 \to R_1 + R_2$,we get:

$$\begin{pmatrix} 2 & 1 & 6 \\ 4 & 0 & 8 \end{pmatrix} \tag{4}$$

$R_1 \to 2R_1 - R_2$,we get:

$$\begin{pmatrix} 0 & 2 & 4 \\ 4 & 0 & 8 \end{pmatrix} \tag{5}$$

$R_1 \to \frac{R_1}{2} \ R_2 \to \frac{R_2}{4}$

$$\begin{pmatrix} 0 & 1 & 2 \\ 1 & 0 & 2 \end{pmatrix} \tag{6}$$

Therefore,x = 2 , y = 2