

## 4.4.23

AI25BTECH11027 - NAGA BHUVANA

**Question:**

If the graph of a pair of lines  $x - 2y + 3 = 0$  and  $2x - 4y = 5$  be drawn, that what type of lines are drawn?

**Solution:**

$$\mathbf{A} = \begin{pmatrix} 1 & -2 \\ 2 & -4 \end{pmatrix}, \mathbf{b} = \begin{pmatrix} -3 \\ 5 \end{pmatrix} \quad (1)$$

Consider the augmented matrix  $\mathbf{M} = (\mathbf{A} \ \mathbf{b})$

$$\mathbf{M} = \begin{pmatrix} 1 & -2 & -3 \\ 2 & -4 & 5 \end{pmatrix} \quad (2)$$

By doing Row operation  $R_2 \leftarrow R_2 - 2R_1$

$$\mathbf{M} = \begin{pmatrix} 1 & -2 & -3 \\ 0 & 0 & 11 \end{pmatrix} \quad (3)$$

$$0x + 0y = 11 \quad (4)$$

The above equations have no solution and the lines are **Parallel**

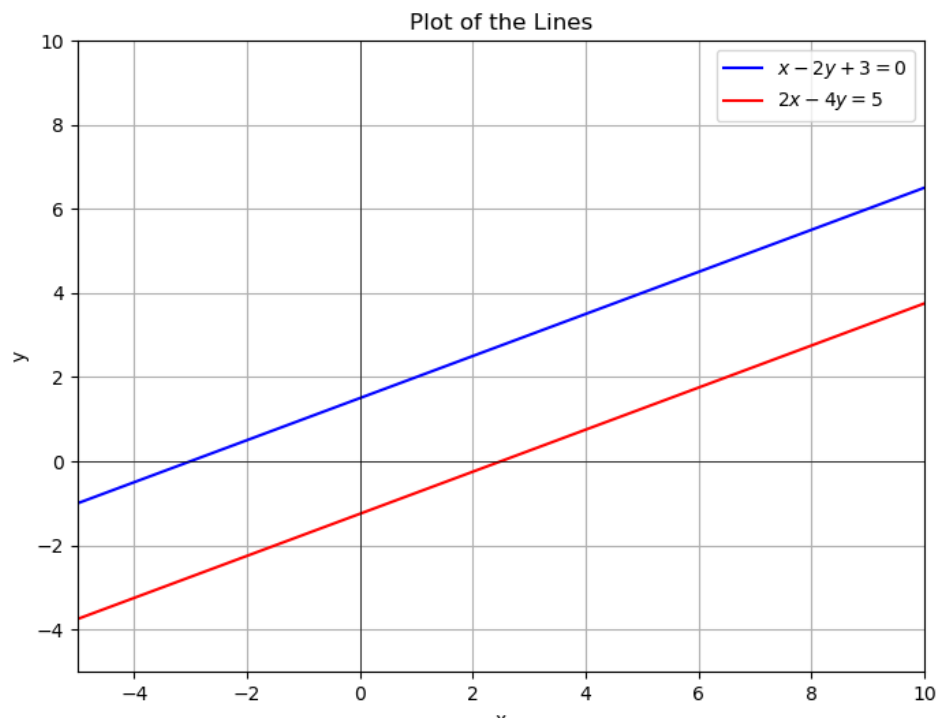


Fig. 1