4.4.23

AI25BTECH11027 - NAGA BHUVANA

September 30, 2025

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:

$$\mathbf{A} = \begin{pmatrix} 1 & -2 \\ 2 & -4 \end{pmatrix}, \mathbf{b} = \begin{pmatrix} -3 \\ 5 \end{pmatrix} \tag{0.1}$$

Consider the augmented matrix $\mathbf{M} = \begin{pmatrix} \mathbf{A} & \mathbf{b} \end{pmatrix}$

$$\mathbf{M} = \begin{pmatrix} 1 & -2 & -3 \\ 2 & -4 & 5 \end{pmatrix} \tag{0.2}$$

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

$$\mathbf{M} = \begin{pmatrix} 1 & -2 & -3 \\ 0 & 0 & 11 \end{pmatrix} \tag{0.3}$$

$$0x + 0y = 11 \tag{0.4}$$

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