

IIT Hyderabad
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ASSIGNMENT 1

Lines and Planes

Problem Statement

Find the equations of the lines which intercepts on the both the axes and whose sum and product are 1 and -6 respectively.

Solution

The intercept form of a straight line is given by

$$\left[\frac{1}{a} \quad \frac{1}{b} \right] \begin{bmatrix} x \\ y \end{bmatrix} = 1 : \text{ where } a \text{ and } b \text{ are } x \text{ and } y \text{ intercepts respectively} \quad (1)$$

Given data in problem statement : $a + b = 1$ and $ab = -6$

Upon solving for a and b we get the set of values as $(3,-2)$ and $(-2,3)$

From (1) the equations of straight line are

$-2x + 3y = -6$ and $3x - 2y = -6$

In matrix form it can be written as

$$\begin{bmatrix} -2 & 3 \\ 3 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -6 \\ -6 \end{bmatrix} \quad (2)$$