Straight Line

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***Abstract* - This document contains solution of plotting a straight line from the given equation.**

Problem

Vector-2, Example-5, Question No.-12

Question 12. Trace the straight line whose equation is :

$$5x - 7y - 9 = 0 \tag{1}$$

Solution :

The given equation is,

$$5x - 7y - 9 = 0 \tag{2}$$

We can write equation (2) as,

$$\begin{pmatrix} 5 & -7 \end{pmatrix} \mathbf{x} = 9 \tag{3}$$

We can find different solutions of the equation (3) as , Let

$$\mathbf{x} = \begin{pmatrix} a \\ 0 \end{pmatrix} \tag{4}$$

Substituting in equation (3),

$$\begin{pmatrix} 5 & -7 \end{pmatrix} \begin{pmatrix} a \\ 0 \end{pmatrix} = 9 \tag{5}$$

$$a = \frac{9}{5} \tag{6}$$

Similarly we can consider,

$$\mathbf{x} = \begin{pmatrix} 0 \\ b \end{pmatrix} \tag{7}$$

Substituting in equation (3),

$$\begin{pmatrix} 5 & -7 \end{pmatrix} \begin{pmatrix} 0 \\ b \end{pmatrix} = 9 \tag{8}$$

$$b = \frac{-9}{7} \tag{9}$$

So, the intercepts of X and Y axes can be obtained as,

$$\mathbf{A} = \begin{pmatrix} \frac{9}{5} \\ 0 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 0 \\ \frac{-9}{7} \end{pmatrix} \tag{10}$$