

4.3.50

EE25BTECH11060 - V.Namaswi

Question

Find the equation of the lines which makes intercepts -3 and 2 on the x and y axes respectively.

Solution

Given that line passes through points $(-3, 0)$ and $(0, 2)$

Let

Vector	<i>coordinate</i>
A	$(-3, 0)$
B	$(0, 2)$
n	(a, b)

As equation of line is given by

$$\mathbf{n}^\top \mathbf{x} = 1 \quad (1)$$

So, for **A**

$$\begin{pmatrix} a \\ b \end{pmatrix}^\top \begin{pmatrix} -3 \\ 0 \end{pmatrix} = 1 \quad (2)$$

for **B**

$$\begin{pmatrix} a \\ b \end{pmatrix}^\top \begin{pmatrix} 0 \\ 2 \end{pmatrix} = 1 \quad (3)$$

(4)

From 2 and 3

$$\begin{pmatrix} -3 & 0 \\ 0 & 2 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 1 \\ 1 \end{pmatrix} \quad (5)$$

In augmented matrix form

$$\left[\begin{array}{cc|c} -3 & 0 & 1 \\ 0 & 2 & 1 \end{array} \right] \quad (6)$$

Divide Row 1 by 3

$$\left[\begin{array}{cc|c} -1 & 0 & \frac{1}{3} \\ 0 & 2 & 1 \end{array} \right] \quad (7)$$

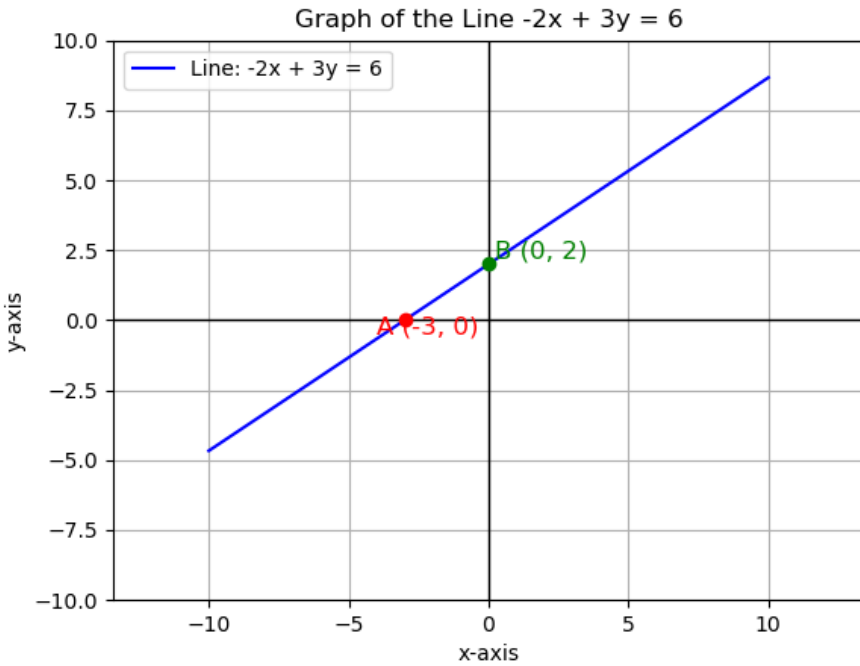
Divide Row 2 by 2

$$\left[\begin{array}{cc|c} -1 & 0 & \frac{1}{3} \\ 0 & 1 & \frac{1}{2} \end{array} \right] \quad (8)$$

$$a = -\frac{1}{3} \text{ and } b = \frac{1}{2} \quad (9)$$

So From 1 equation of line is

$$\left(\begin{array}{c} -\frac{1}{3} \\ \frac{1}{2} \end{array} \right)^T \mathbf{x} = 1 \quad (10)$$



(11)