4-4.2-12

EE24BTECH11005 - Arjun Pavanje

Question:
Find the direction and normal vectors of the given line $3 = 2x + y$

Variable	Description
m	Direction vector
n	Normal vector
h	$\begin{pmatrix}0\\c\end{pmatrix}$

TABLE I: Variables Used

Solution: The equation of the line is given by,

$$2x + y = 3 \tag{1}$$

$$\mathbf{x} = \begin{pmatrix}0\\3\end{pmatrix} + k\begin{pmatrix}3\\-2\end{pmatrix} \tag{2}$$

$$\mathbf{m} = \begin{pmatrix}1\\-2\end{pmatrix} \tag{3}$$

equation of line in terms of normal vector **n** is,

$$2x + y = 3 \tag{4}$$

$$\begin{pmatrix}2 & 1\end{pmatrix}\mathbf{x} = 3 \tag{5}$$

$$\mathbf{n}^{\top}\mathbf{x} = c \tag{6}$$

$$\mathbf{n} = \begin{pmatrix}2\\1\end{pmatrix} \tag{7}$$

Direction vector: $\mathbf{m} = \begin{pmatrix}1\\-2\end{pmatrix}$

Normal Vector: $\mathbf{n} = \begin{pmatrix}2\\1\end{pmatrix}$

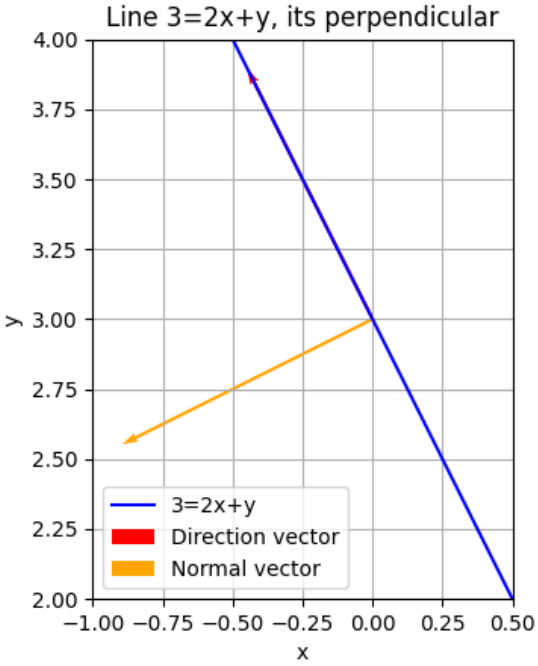

Fig. 1: Plot of the line