4-4.2-6

EE24BTECH11030 - J.KEDARANANDA

Question:
Find the direction and normal vectors of the following line:
3x + 2 = 0
Solution:

Description	Given value
Line	3x + 2 = 0

TABLE 0

For the line of form Ax+By+C=0 the normal vector is given by

$$n = \begin{pmatrix} A \\ B \end{pmatrix} \tag{0.1}$$

$$A = 3, B = 0 \tag{0.2}$$

$$\implies n = \begin{pmatrix} 3 \\ 0 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \tag{0.3}$$

Let the direction vector be d=$\begin{pmatrix} a \\ b \end{pmatrix}$

$$d^T.n = 0 \tag{0.4}$$

$$3a = 0 \tag{0.5}$$

$$\implies d = \begin{pmatrix} 0 \\ -3 \end{pmatrix} = \begin{pmatrix} 0 \\ -1 \end{pmatrix} \tag{0.6}$$

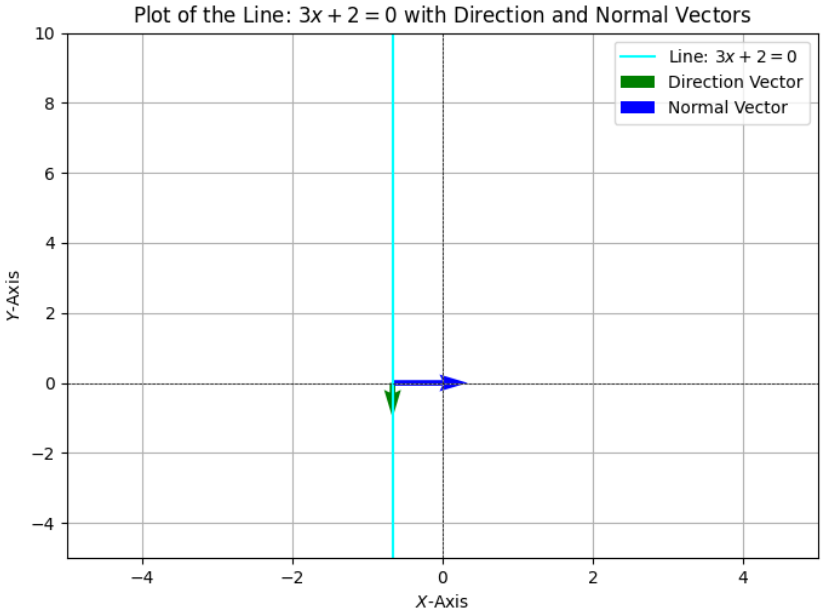

Fig. 0.1: Line $Line 3x + 2 = 0$