Question-3-3.2-22

EE24BTECH11038 - MALAKALA BALA SUBRAHMANYA ARAVIND

Question:
Find the direction and normal vectors of the following line:
x+2y=6
Solution:

Description	Given value
Line	x+2y=6

TABLE 0: variables used

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

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

$$A = 1, B = 2 \tag{0.2}$$

$$\implies n = \begin{pmatrix} 1 \\ 2 \end{pmatrix} \tag{0.3}$$

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

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

$$a + 2b = 0 \tag{0.5}$$

$$\implies d = \begin{pmatrix} -2 \\ 1 \end{pmatrix} \tag{0.6}$$

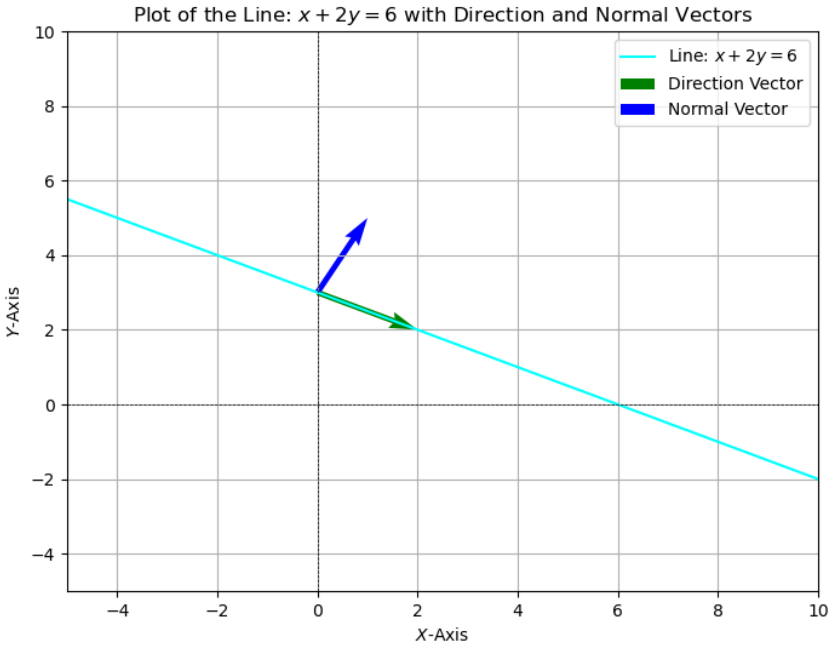

Fig. 0.1: Line $Linex + 2y = 6$