4 - Linear Forms

EE1030:Matrix Theory

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Question:4.2.16
Find the direction and normal vectors of $2 + 3y = 7x$.
Solution:

Actual Name	Assigned Variable
direction vector	**d**
normal vector	**n**

Table 4.2.16.1 0: Assigning Variables

For a line equation $y = mx + c$, direction and normal vectors are given by

$$\mathbf{d} = \begin{pmatrix} 1 \\ m \end{pmatrix} \tag{0.1}$$

$$\mathbf{n} = \begin{pmatrix} -m \\ 1 \end{pmatrix} \tag{0.2}$$

The above line equation can be written as $y = \frac{7}{3}x - \frac{2}{3}$
So $m = \frac{7}{3}$,

$$\mathbf{d} = \begin{pmatrix} 1 \\ \frac{7}{3} \end{pmatrix} \tag{0.3}$$

$$\mathbf{n} = \begin{pmatrix} \frac{-7}{3} \\ 1 \end{pmatrix} \tag{0.4}$$

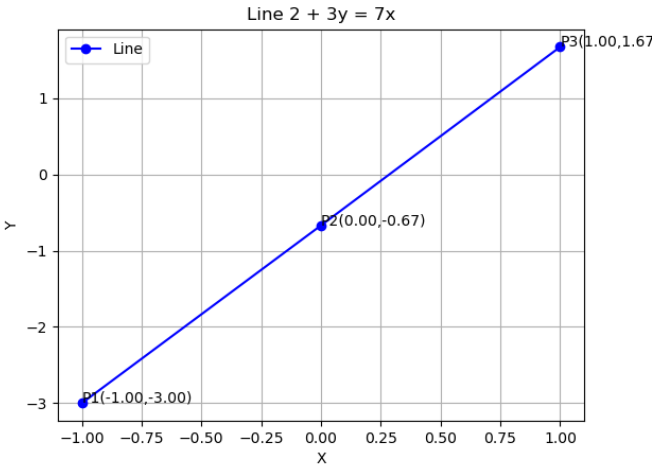

Fig. 0.1: Line $2 + 3y = 7x$