ASSIGNMENT-3

Nagajyothi

1 QUESTION No-2.19 (Linear forms)

Find the equation of the parallel to the line $= \begin{pmatrix}3 & -4\end{pmatrix}\mathbf{x} = 2$ and passing through the point $\begin{pmatrix}2\\3\end{pmatrix}$

2 Solution

Given

$$\begin{pmatrix}3 & -4\end{pmatrix}\mathbf{x} = 2 \tag{2.0.1}$$

$$\mathbf{A} = \begin{pmatrix}2\\3\end{pmatrix} \tag{2.0.2}$$

Equation can be written as,

$$\mathbf{n^T x} = c \tag{2.0.3}$$

Where,

$$\mathbf{n} = \begin{pmatrix}3\\-4\end{pmatrix} \tag{2.0.4}$$

$$c = 2 \tag{2.0.5}$$

Equation of the line in terms of the normal vector is obtained as

$$\mathbf{n}^T(\mathbf{x} - \mathbf{A}) = 0 \tag{2.0.6}$$

$$\implies \begin{pmatrix}\frac{-3}{4} & 1\end{pmatrix}\mathbf{x} = \frac{3}{2} \tag{2.0.7}$$

$$\implies \begin{pmatrix}-3 & 4\end{pmatrix}\mathbf{x} = 6 \tag{2.0.8}$$

Plot of the parallel

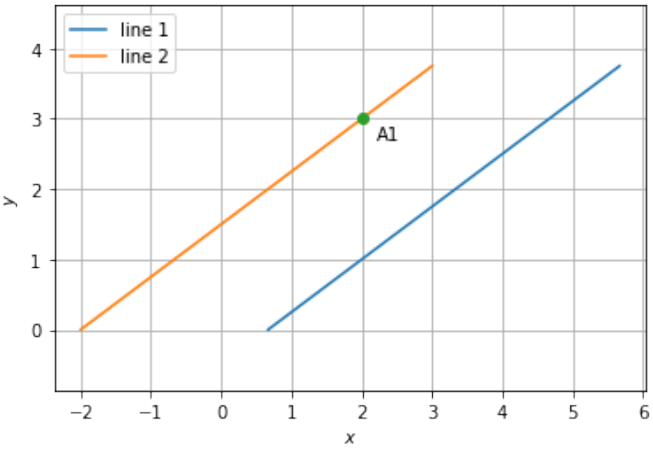

Fig. 2.1: download(3)(2).png