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 $\begin{pmatrix}2\\3\end{pmatrix}$

Solution

the direction vector is $\mathbf{m} = \begin{pmatrix}1\\\frac{3}{4}\end{pmatrix}$ hence the normal vector is

$$\mathbf{n} = \begin{pmatrix}0 & -1\\1 & 0\end{pmatrix}\mathbf{m} \tag{1.0.1}$$

$$= \begin{pmatrix}\frac{-3}{4}\\1\end{pmatrix} \tag{1.0.2}$$

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

$$\mathbf{n}^T(\mathbf{x} - \mathbf{A}) = 0 \tag{1.0.3}$$

$$\implies \begin{pmatrix}\frac{-3}{4} & 1\end{pmatrix}\mathbf{x} = \frac{3}{2} \tag{1.0.4}$$

$$\implies \begin{pmatrix}-3 & 4\end{pmatrix}\mathbf{x} = 6 \tag{1.0.5}$$

Plot of the parallel

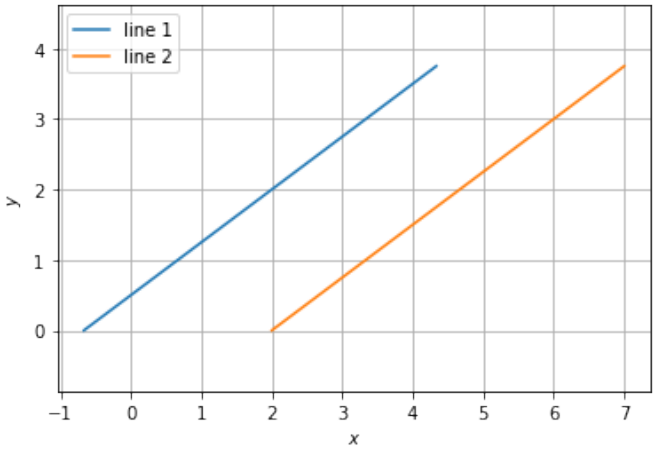

Fig. 1.1: figure.(3)(2).png