Assignment 3

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Vector

***Abstract*—This document contains the solution to find the area of a triangle, from the given coordinates of the vertices.**

Download all python codes from

https://github.com/AP1920/Assignment−3/blob/main/Assignment%202.ipynb

Download latex-tikz codes from

https://github.com/AP1920/Assignment−3/blob/main/main.tex

1 Problem

1.1 Vector 2, Example-5,11

Trace the straight line whose equation is :

$$x + 2y + 3 = 0 \tag{1.1.1}$$

2 Solution

The given equation is,

$$x + 2y + 3 = 0 \tag{2.0.1}$$

We can write equation (2.0.1) as,

$$\begin{pmatrix}1 & 2\end{pmatrix}\mathbf{x} = -3 \tag{2.0.2}$$

We can find different solutions of the equation (2.0.2) as ,
Let

$$\mathbf{x} = \begin{pmatrix}p\\0\end{pmatrix} \tag{2.0.3}$$

Substituting in equation (2.0.2),

$$\begin{pmatrix}1 & 2\end{pmatrix}\begin{pmatrix}p\\0\end{pmatrix} = -3 \tag{2.0.4}$$

$$p = -3 \tag{2.0.5}$$

Similarly we can consider,

$$\mathbf{x} = \begin{pmatrix}0\\q\end{pmatrix} \tag{2.0.6}$$

Substituting in equation (2.0.2),

$$\begin{pmatrix}1 & 2\end{pmatrix}\begin{pmatrix}0\\q\end{pmatrix} = -3 \tag{2.0.7}$$

$$q = \frac{-3}{2} \tag{2.0.8}$$

So, the intercepts of X and Y axes can be obtained as,

$$\mathbf{P} = \begin{pmatrix}-3\\0\end{pmatrix}, \mathbf{B} = \begin{pmatrix}0\\\frac{-3}{2}\end{pmatrix} \tag{2.0.9}$$

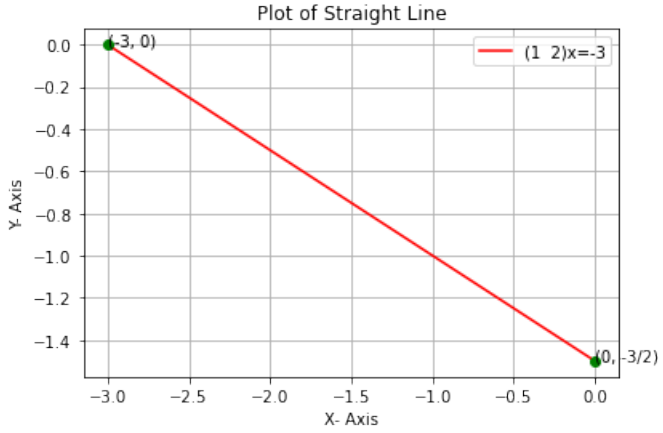

Fig. 1: Plot obtained from Python code