Assignment 3

Vishal Mate

Plotting Line

Abstract—**This document contains the sketching of the loci using equations.**

1 PROBLEM

Solve: **Problem set: Vector2, Example-5,7(1)** Find the equation to the straight line which passes through the point (5,6) and has intercept on the axes ¿¿ equal in magnitude and both positive.

2 SOLUTION

The line passes through the given points

$$\mathbf{x}_1 = \begin{pmatrix} 5 \\ 6 \end{pmatrix}$$

We know that,

$$\frac{x}{a} + \frac{y}{b} = 1$$

As intercept are equal, $a = b$

$$\frac{x}{a} + \frac{y}{a} = 1 \tag{2.0.1}$$

resulting in the the equation

$$\left(x\right) + \left(y\right) = \left(a\right) \tag{2.0.2}$$

Putting the x and y values in above equation.

$$\left(x\right) + \left(y\right) = \left(a\right) 5 + 6 = \left(a\right)\left(a\right) = 11 \tag{2.0.3}$$

Finding the equation of line using value of a
Thus the equation of the desired line is

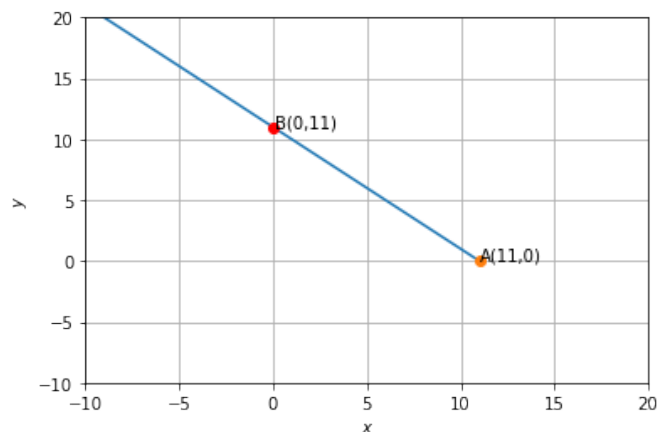$$\left(x\right) + \left(y\right) = 11 \text{or,} \ \left(x\right) + \left(y\right) - 11 = 0 \tag{2.0.4}$$

Fig. 1: Plot obtained from Python code