

Assignment 2

Aman Pratap Singh

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-2/blob/main/Assignment%202.ipynb>

Download latex-tikz codes from

<https://github.com/AP1920/Assignment-2/blob/main/main.tex>

1 PROBLEM

1.1 Vector 2, Example-4,13

Find the equation to the locus of a point which is always equidistant from the points whose coordinates are

$$\mathbf{A} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \text{ and } \mathbf{B} = \begin{pmatrix} 0 \\ -2 \end{pmatrix} \quad (1.1.1)$$

2 SOLUTION

We will be using distance formula to calculate the equation of loci

Let a point $P = \begin{pmatrix} x \\ y \end{pmatrix}$ which is equidistant from the above points
So,

$$\|\mathbf{P} - \mathbf{A}\| = \|\mathbf{P} - \mathbf{B}\| \quad (2.0.1)$$

$$\sqrt{(x-1)^2 + (y-0)^2} = \sqrt{(x-0)^2 + (y-(-2))^2} \quad (2.0.2)$$

Equating both sides

$$x^2 + 1^2 + y^2 = x^2 + y^2 + 4 + 4y \quad (2.0.3)$$

$$1 - 2x = 4 + 4y \quad (2.0.4)$$

Arranging the above equation

$$2x + 4y + 3 = 0 \quad (2.0.5)$$

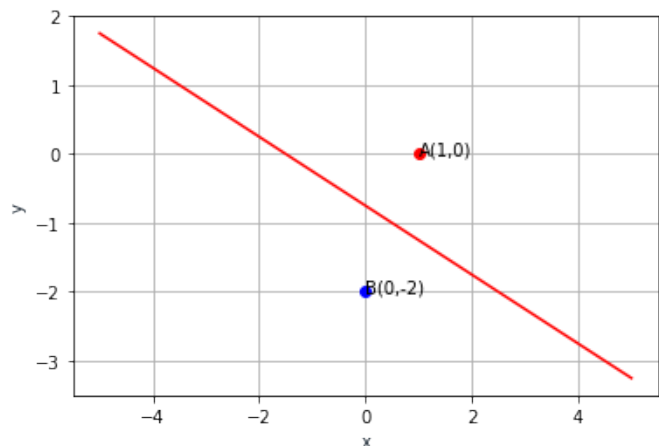


Fig. 1: Plot obtained from Python code