

Assignment 2

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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-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

Consider a point

$$\mathbf{x} = \begin{pmatrix} x \\ y \end{pmatrix} \quad (2.0.1)$$

, which is equidistant from the above points. So,

$$\|\mathbf{P} - \mathbf{A}\| = \|\mathbf{P} - \mathbf{B}\| \quad (2.0.2)$$

Then

$$\|\mathbf{P} - \mathbf{A}\|^2 = \|\mathbf{P} - \mathbf{B}\|^2 \quad (2.0.3)$$

Solving the above equation,

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

Solving the above equation we get the required equation of locus

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

We can write the above equation as

$$\begin{pmatrix} 2 & 4 \end{pmatrix} \mathbf{x} = -3 \quad (2.0.6)$$

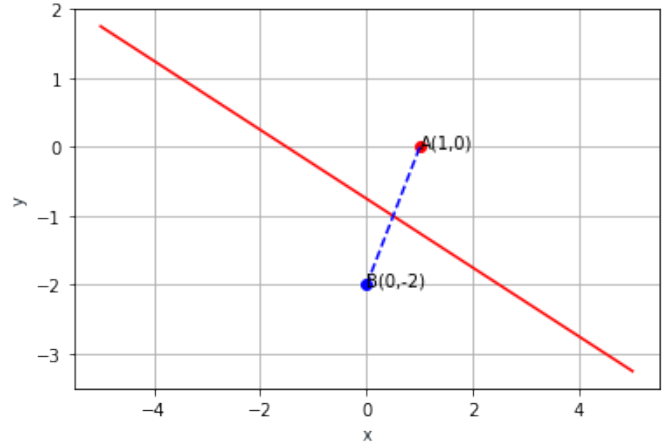


Fig. 1: Plot obtained from Python code