

Assignment 1

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Find Python Codes from below link

<https://github.com/HimaMadhu/internship/blob/main/Assignment1/Assignment1.py>

and latex-tikz codes from

<https://github.com/HimaMadhu/internship/blob/main/assignment1/assignment%201.tex>

1 EXAMPLES 1

Question 1

Find the value of x_1 if the distance between the points $(x_1, 2)$ and $(3, 4)$ be 8

$$\begin{pmatrix} x_1 \\ 2 \end{pmatrix}, \begin{pmatrix} 3 \\ 4 \end{pmatrix} \quad (1.0.1)$$

1.1 Solution

The distance between two vectors is given by

$$\|\mathbf{A} - \mathbf{B}\| = \sqrt{(\mathbf{A} - \mathbf{B})^T (\mathbf{A} - \mathbf{B})} \quad (1.1.1)$$

$$\left\| \begin{pmatrix} x_1 \\ 2 \end{pmatrix} - \begin{pmatrix} 3 \\ 4 \end{pmatrix} \right\| = 8 \quad (1.1.2)$$

$$\left\| \begin{pmatrix} x_1 - 3 \\ -2 \end{pmatrix} \right\| = 8 \quad (1.1.3)$$

$$\sqrt{(x_1 - 3)^2 + (-2)^2} = 8 \quad (1.1.4)$$

$$(x_1 - 3)^2 + (-2)^2 = 8^2 \quad (1.1.5)$$

$$x_1^2 - 6x_1 + 9 + 4 = 64 \quad (1.1.6)$$

$$= x_1^2 - 6x_1 - 51 \quad (1.1.7)$$

On solving for x_1 in above quadratic equation

$$\Rightarrow x_1 = 3 + 2\sqrt{15}, x_1 = 3 - 2\sqrt{15} \quad (1.1.8)$$

$$\Rightarrow x_1 = 10.745, x_1 = -4.745 \quad (1.1.9)$$

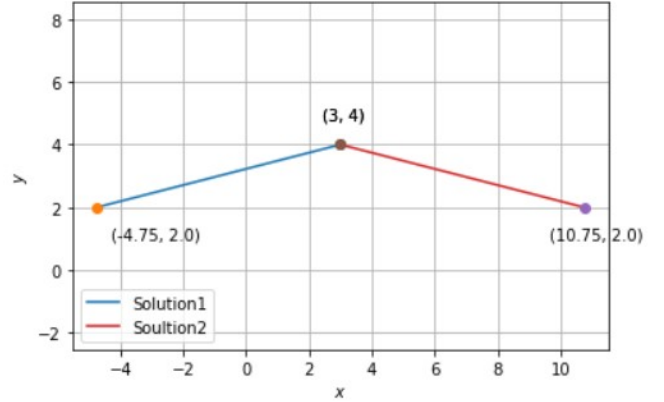


Fig. 0