Assignment 5

Mondedla Anil

Find Python Codes from below link

https://github.com/AnilMondedla/CBSE

and latex-tikz codes from

https://github.com/AnilMondedla/CBSE

1 Examples 1

1.1 Question 6

Find the values of x for which the distance between the points A(x, 2) and B(9, 8) is 10 units.

1.2 Solution

The distance between two vectors is given by

$$\mathbf{A} = \begin{pmatrix} x \\ 2 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 9 \\ 8 \end{pmatrix} \tag{1.2.1}$$

$$\|\mathbf{A} - \mathbf{B}\| \tag{1.2.2}$$

From (**??**)

$$\|\mathbf{A} - \mathbf{B}\| = \sqrt{\left(\mathbf{A} - \mathbf{B}\right)^{\mathsf{T}} \left(\mathbf{A} - \mathbf{B}\right)} \tag{1.2.3}$$

$$\sqrt{\left(\begin{pmatrix} x \\ 2 \end{pmatrix} - \begin{pmatrix} 9 \\ 8 \end{pmatrix}\right)^{\mathsf{T}} \left(\begin{pmatrix} x \\ 2 \end{pmatrix} - \begin{pmatrix} 9 \\ 8 \end{pmatrix}\right)} = 10 \tag{1.2.4}$$

$$\sqrt{\begin{pmatrix} x-9 \\ -6 \end{pmatrix}^{\mathsf{T}} \begin{pmatrix} x-9 \\ -6 \end{pmatrix}} = 10 \tag{1.2.5}$$

$$\sqrt{\begin{pmatrix} x-9 & -6 \end{pmatrix} \begin{pmatrix} x-9 \\ -6 \end{pmatrix}} = 10 \tag{1.2.6}$$

$$\sqrt{\left(x-9\right)^2 + \left(-6\right)^2} = 10 \tag{1.2.7}$$

$$\left(x-9\right)^2 + \left(-6\right)^2 = 100 \tag{1.2.8}$$

$$x^2 - 18x + 17 = 0 \tag{1.2.9}$$

$$x = 1 \text{ or } 17.$$

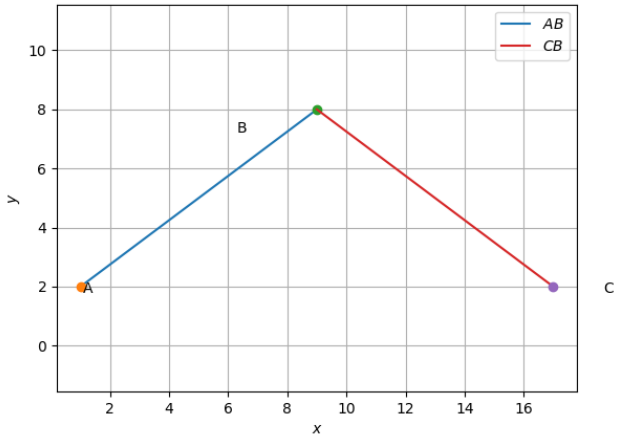

Fig. 0