Assignment 1

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Find Python Codes from below link

https://raw.githubusercontent.com/jaisai1337/IITH/
    main/SU/Assignment1/code.py

and Latex codes from below link

https://raw.githubusercontent.com/jaisai1337/IITH/
    main/SU/Assignment1/main.tex

1 EXAMPLES 1

1.1 Question 1

Find the distance between the following pairs of points

$$\begin{pmatrix} 1 \\ -3 \end{pmatrix}, \begin{pmatrix} -2 \\ 1 \end{pmatrix} \qquad (1.1.1)$$

1.2 Solution

The distance between two vectors is given by

$$\|\mathbf{A} - \mathbf{B}\| \qquad (1.2.1)$$

From (1.2.1)

$$\|\mathbf{A} - \mathbf{B}\| = \sqrt{(\mathbf{A} - \mathbf{B})^\top (\mathbf{A} - \mathbf{B})} \qquad (1.2.2)$$

$$= \left\| \begin{pmatrix} 1 \\ -3 \end{pmatrix} - \begin{pmatrix} -2 \\ 1 \end{pmatrix} \right\| \qquad (1.2.3)$$

$$= \left\| \begin{pmatrix} 3 \\ -4 \end{pmatrix} \right\| \qquad (1.2.4)$$

$$= \sqrt{\begin{pmatrix} 3 & -4 \end{pmatrix} \cdot \begin{pmatrix} 3 \\ -4 \end{pmatrix}} \qquad (1.2.5)$$

$$= \sqrt{3^2 \left(-4\right)^2} \qquad (1.2.6)$$

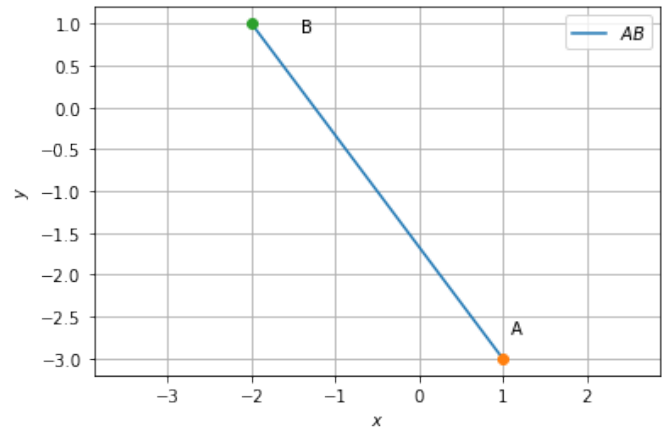$$= \sqrt{\left(9 + 16\right)}$$

$$= 5$$

Fig. 0