Assignment 4

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Find Python Codes from below link

https://github.com/KeshavRoy/Assignment_4

and latex-tikz codes from

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1 Examples 1

1.1 Question 2

Find the distance between the following pairs of points

$$\begin{pmatrix}4\\-7\end{pmatrix},\begin{pmatrix}-1\\5\end{pmatrix} \tag{1.1.1}$$

1.2 Solution

The distance between two vectors is given by

$$\|\mathbf{A}-\mathbf{B}\| \tag{1.2.1}$$

From (1.2.1)

$$\|\mathbf{A}-\mathbf{B}\| = \sqrt{\left(\mathbf{A}-\mathbf{B}\right)^{\mathsf{T}}\left(\mathbf{A}-\mathbf{B}\right)} \tag{1.2.2}$$

$$= \sqrt{\left(\begin{pmatrix}4\\-7\end{pmatrix}-\begin{pmatrix}-1\\5\end{pmatrix}\right)^{\mathsf{T}}\left(\begin{pmatrix}4\\-7\end{pmatrix}-\begin{pmatrix}-1\\5\end{pmatrix}\right)} \tag{1.2.3}$$

$$= \sqrt{\begin{pmatrix}5\\-12\end{pmatrix}^{\mathsf{T}}\begin{pmatrix}5\\-12\end{pmatrix}} \tag{1.2.4}$$

$$= \sqrt{\begin{pmatrix}5 & -12\end{pmatrix}\begin{pmatrix}5\\-12\end{pmatrix}} \tag{1.2.5}$$

$$= \sqrt{\left(25+144\right)}$$

$$= 13$$

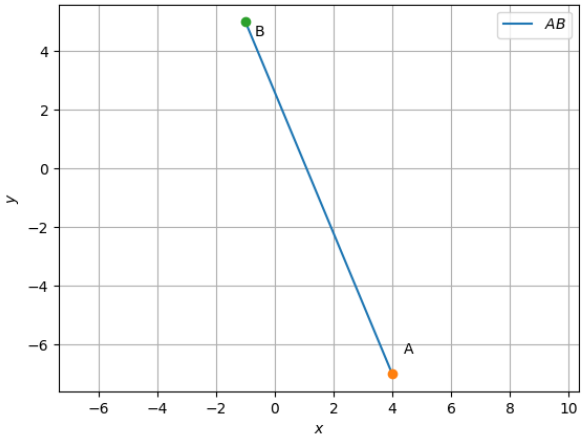

Fig. 0