Assignment 1

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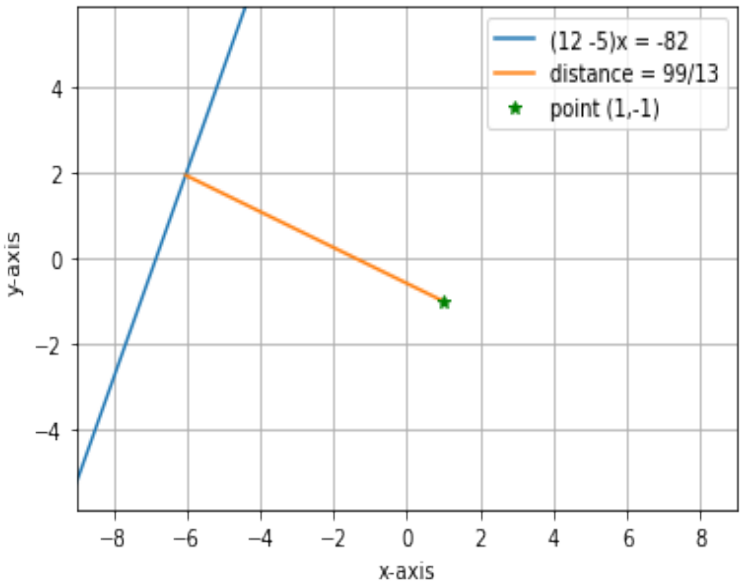
Download the python code from

https://github.com/jvinaykumar12/EE5609/tree/master/Assignment1

and latex-file codes from

https://github.com/jvinaykumar12/EE5609/tree/master/Assignment1



1 Question No.33

Find the distance of the point $\begin{pmatrix}1\\-1\end{pmatrix}$ from the line $\begin{pmatrix}12 & -5\end{pmatrix}\mathbf{x} = -82$

2 Explanation

The formula for calculating the distance between the point and the given line is

$$\|P - A\| = \frac{|\mathbf{c} - \mathbf{n}^T\mathbf{A}|}{\|n\|} \tag{2.0.1}$$

By substituting the given values

$$\mathbf{A} = \begin{pmatrix}1\\-1\end{pmatrix} \quad \mathbf{n} = \begin{pmatrix}12\\-5\end{pmatrix} \quad c = -82 \tag{2.0.2}$$

we get

$$\mathbf{n}^T\mathbf{A} = 17 \tag{2.0.3}$$

Thus, the distance between the point and the line is

$$\mathbf{d} = \frac{99}{13} \tag{2.0.4}$$