Assignment 3

Hruday Beeravelli

Find Python Codes from below link

https://github.com/Hruday-Beeravelli/INTERNSHIP-IITH-1/blob/main/Assignment2/A2.py

and Latex codes from below link

https://github.com/Hruday-Beeravelli/INTERNSHIP-IITH-1/blob/main/Assignment2/A2.tex

1 Examples 1

1.1 Question 16

Find coordinates of a point which divides the line joining the points (1, 3) and (2, 7) in the ratio 3 : -4

(1.1.1)

1.2 Solution

Let the I and E be coordinates dividing the line AB in the ratio $m : n$ internally and externally

$$\mathbf{I} = \frac{m\mathbf{B} + n\mathbf{A}}{m+n} \tag{1.2.1}$$

$$\mathbf{E} = \frac{m\mathbf{B} - n\mathbf{A}}{m+n} \tag{1.2.2}$$

Let $\mathbf{A} = \begin{pmatrix}1\\3\end{pmatrix}, \mathbf{B} = \begin{pmatrix}2\\7\end{pmatrix}, m = 3, n = -4$

From (1.2.1)

$$\mathbf{I} = \frac{3\begin{pmatrix}2\\7\end{pmatrix} + \left(-4\right)\begin{pmatrix}1\\3\end{pmatrix}}{3+\left(-4\right)} \tag{1.2.3}$$

$$= -\left(\begin{pmatrix}6\\21\end{pmatrix} + \begin{pmatrix}-4\\-12\end{pmatrix}\right) \tag{1.2.4}$$

$$\mathbf{I} = \begin{pmatrix}-2\\-9\end{pmatrix} \tag{1.2.5}$$

From (1.2.2)

$$\mathbf{E} = \frac{3\begin{pmatrix}2\\7\end{pmatrix} - \left(-4\right)\begin{pmatrix}1\\3\end{pmatrix}}{3+\left(-4\right)} \tag{1.2.6}$$

$$= -\left(\begin{pmatrix}6\\21\end{pmatrix} - \begin{pmatrix}-4\\-12\end{pmatrix}\right) \tag{1.2.7}$$

$$\mathbf{E} = \begin{pmatrix}10\\33\end{pmatrix} \tag{1.2.8}$$

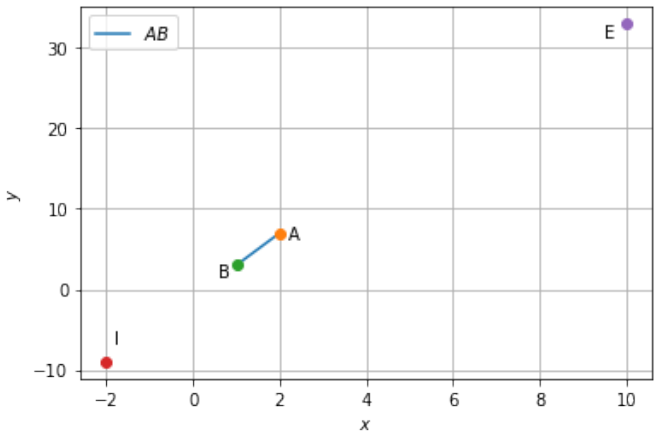

Fig. 0