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

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

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

$$\mathbf{E} = \frac{m\mathbf{B} - n\mathbf{A}}{m+n}$$
(1.2.1)

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)

$$= \frac{3\binom{2}{7} + (-4)\binom{1}{3}}{3 + (-4)} \tag{1.2.3}$$

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

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

From (1.2.2)

$$= \frac{3\binom{2}{7} - \left(-4\right)\binom{1}{3}}{3 + \left(-4\right)} \tag{1.2.6}$$

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

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

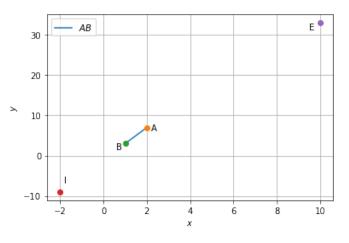


Fig. 0