SM5083
Assignment Number 01

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1. Chapter II Ex-14 Q. 1

1) Problem Statement:Find the in-centres of the triangles whose vertices are as follows, (6,-3), (6,18), $(\frac{-2}{3}, 2)$

Solution: let

$$\mathbf{A} = \begin{pmatrix} 6 \\ -3 \end{pmatrix}, \mathbf{B} = \begin{pmatrix} 6 \\ 18 \end{pmatrix}, \mathbf{C} = \begin{pmatrix} \frac{-2}{3} \\ 2 \end{pmatrix} \tag{1.1}$$

$$\mathbf{a} = \|\mathbf{B} - \mathbf{C}\| = 17.334 \tag{1.2}$$

$$\mathbf{b} = \|\mathbf{C} - \mathbf{A}\| = 16.416 \tag{1.3}$$

$$\mathbf{c} = \|\mathbf{A} - \mathbf{B}\| = 31 \tag{1.4}$$

Now in-centre of a triangle,

$$In - centre\ \mathbf{I} = \frac{\mathbf{a}\|\mathbf{A}\| + \mathbf{b}\|\mathbf{B}\| + \mathbf{c}\|\mathbf{C}\|}{\mathbf{a} + \mathbf{b} + \mathbf{c}} \tag{1.5}$$

$$\mathbf{I} = \begin{pmatrix} \frac{181.73}{64.75} \\ \frac{132.15}{64.75} \end{pmatrix} \tag{1.6}$$

$$\mathbf{I} = \begin{pmatrix} 2.8 \\ 2.1 \end{pmatrix} \tag{1.7}$$

Hence, the In-Centre of Triangle I = (2.8,2.1)

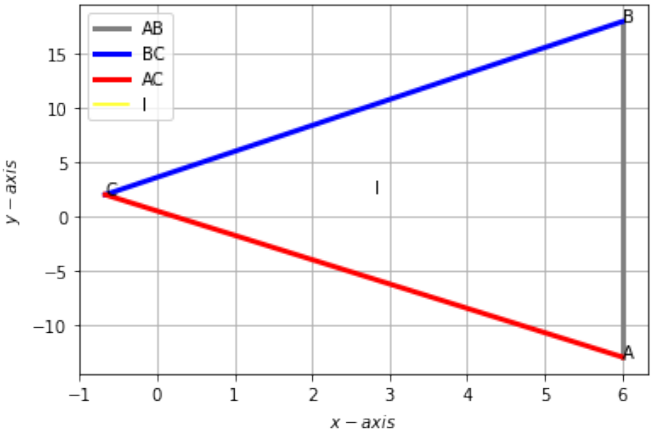

Fig. 1. A Triangle for given points