

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

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

$$a = \|\mathbf{B} - \mathbf{C}\| = 17.334 \quad (1.2)$$

$$b = \|\mathbf{C} - \mathbf{A}\| = 8.3 \quad (1.3)$$

$$c = \|\mathbf{A} - \mathbf{B}\| = 21 \quad (1.4)$$

Now in-centre of a triangle,

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

$$\mathbf{I} = \begin{pmatrix} \frac{139.6}{46.6} \\ \frac{139.5}{46.6} \end{pmatrix} \quad (1.6)$$

$$\mathbf{I} = \begin{pmatrix} 2.995 \\ 2.993 \end{pmatrix} \quad (1.7)$$

Hence, the In-Centre of Triangle

$$\mathbf{I} = (2.995, 2.993)$$

$$\mathbf{I} = (3, 3)$$

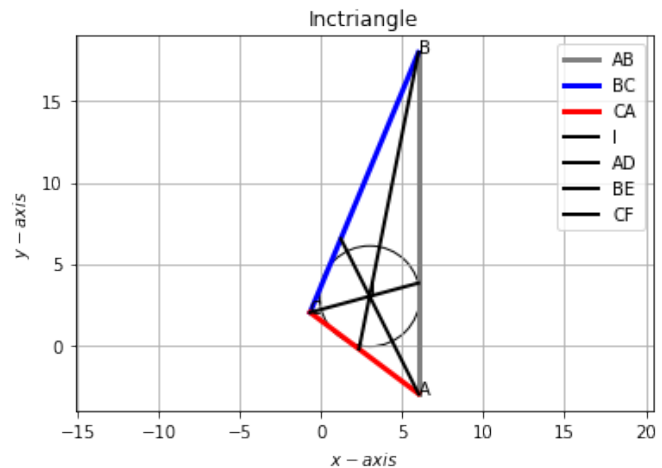


Fig. 1. A Triangle for given points