Assignment - 1

EE23010: Probability and Random Processes
Indian Institute of Technology,Hyderabad

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Question 1.5.7: Draw a circle with its centre as I (incentre) and radius r (inradius)

Solution: Given,

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix} \tag{1}$$

$$\mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix} \tag{2}$$

$$\mathbf{C} = \begin{pmatrix} -3 \\ -5 \end{pmatrix} \tag{3}$$

The incentre of the triangle is:

$$\mathbf{I} = \frac{1}{\sqrt{37} + 4 + \sqrt{61}} \begin{pmatrix} \sqrt{61} - 16 - 3\sqrt{37} \\ -\sqrt{61} + 24 - 5\sqrt{37} \end{pmatrix} \tag{4}$$

$$\implies \mathbf{I} = \begin{pmatrix} -1.45 \\ -0.78 \end{pmatrix} \tag{5}$$

The inradius of the triangle is:

$$r = \frac{185 + 41\sqrt{37} - 37\sqrt{61} - \sqrt{2257}}{6\sqrt{74}} \tag{6}$$

$$= 1.896 \tag{7}$$

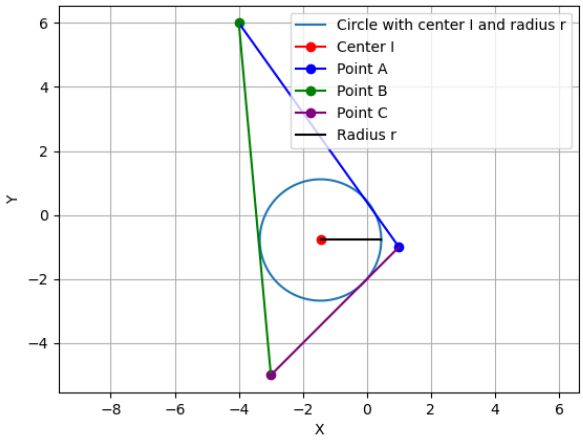

Fig. 0. Figure-1