Question 1.5.7

SREEKAR CHEELA - EE22BTECH11051*

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

Solution : The vertices of the given triangle are:

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

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

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

The incentre of the triangle is:

$$\mathbf{I} = \begin{pmatrix} -1.48 \\ -0.79 \end{pmatrix} \tag{4}$$

The inradius of the triangle is:

$$r = \frac{185 + 41\sqrt{37} - 37\sqrt{61} - \sqrt{2257}}{6\sqrt{74}} = 1.896 \tag{5}$$

(6)

The equation of the incircle is given as :

$$\|\mathbf{x} - \mathbf{I}\|^2 = r^2 \tag{7}$$

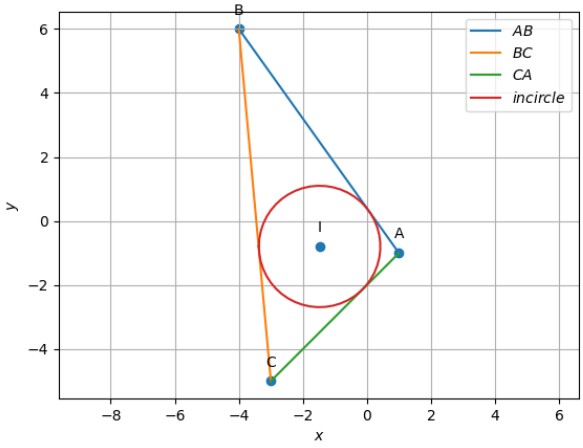

Fig. 0. Triangle with the incircle generated using python

*The author is with the Department of Electrical Engineering, Indian Institute of Technology, Hyderabad 502285 India e-mail: ee22btech11051@iith.ac.in.