

# Question 1.5.7

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

**Solution :** The vertices of the given triangle are:

$$\mathbf{A} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}; \quad (1)$$

$$\mathbf{B} = \begin{pmatrix} -4 \\ 6 \end{pmatrix}; \quad (2)$$

$$\mathbf{C} = \begin{pmatrix} -3 \\ -5 \end{pmatrix} \quad (3)$$

The incentre of the triangle is:

$$\mathbf{I} = \begin{pmatrix} -1.48 \\ -0.79 \end{pmatrix} \quad (4)$$

The inradius of the triangle is:

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

(6)

The equation of the incircle is given as :

$$\|\mathbf{x} - \mathbf{I}\|^2 = r^2 \quad (7)$$

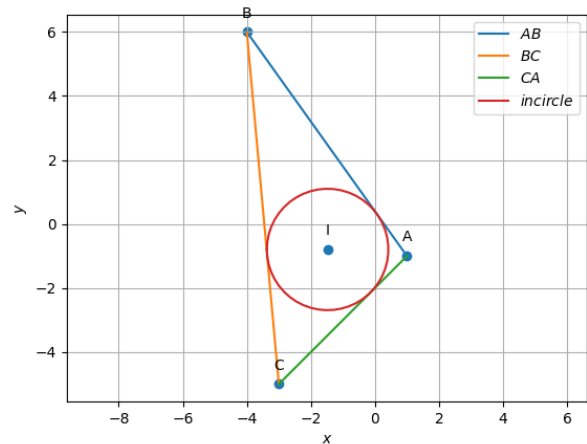


Fig. 0. Triangle with the incircle generated using python

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