

Draw the circle with centre at **O** and radius

$R = OA$

This is known as the circumradius

Solution:

Given,

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

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

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

Let AD, BE, CF are altitudes of triangle from vertices **A**, **B**, **C** respectively.

Equation of AD,

$$AD = \begin{pmatrix} 1 + t \\ -1 + \frac{t}{11} \end{pmatrix} \quad (4)$$

Equation of BE,

$$BE = \begin{pmatrix} -4 + s \\ 6 - s \end{pmatrix} \quad (5)$$

The point of intersection of AD and BE is **O**; Therefore,

$$\mathbf{O} = \begin{pmatrix} \frac{17}{6} \\ \frac{5}{6} \end{pmatrix} \quad (6)$$

Radius of circle with centre **O**

$$R = OA = \frac{11\sqrt{22}}{6} \quad (7)$$

Therefore;

Equation of circle is

$$\left(x - \frac{17}{6}\right)^2 + \left(y - \frac{5}{6}\right)^2 = \left(\frac{11\sqrt{22}}{6}\right)^2 \quad (8)$$