Draw the circle with centre at **O** and radius
R = OA
This is known as the circumradius
Solution:
Given,

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

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

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

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

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

Equation of BE,

$$BE = \begin{pmatrix} -4+s \\ 6-s \end{pmatrix} \tag{5}$$

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

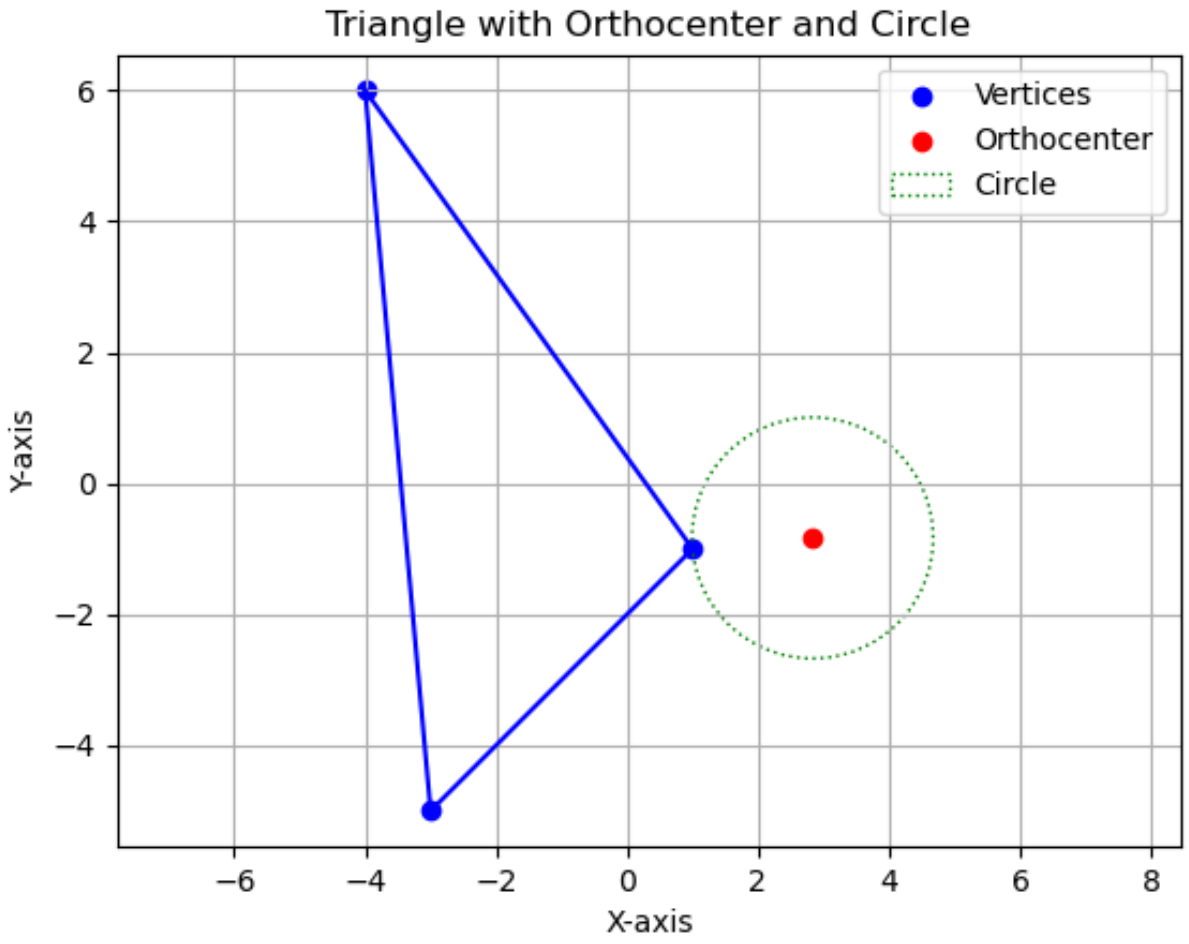
$$\mathbf{O} = \begin{pmatrix} \frac{17}{6} \\ \frac{-5}{6} \end{pmatrix} \tag{6}$$

Radius of circle with centre **O**

$$R = OA = \frac{\sqrt{122}}{6} \tag{7}$$

Therefore;
The equation of circle is

$$\left(x - \frac{17}{6}\right)^2 + \left(y - \frac{-5}{6}\right)^2 = \left(\frac{\sqrt{122}}{6}\right)^2 \tag{8}$$


Triangle with Orthocenter and Circle
Vertices
Orthocenter
Circle
Y-axis
X-axis
6
4
2
0
−2
−4
−6
−4
−2
0
2
4
6
8