3.2.1

EE25BTECH11060 - V.Namaswi

Question

Draw a triangle ABC in which AB=4cm,BC=6cm and AC=9cm.

Solution

According to given data lets assume,

$$\mathbf{A} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \qquad \mathbf{B} = \begin{pmatrix} 4 \\ 0 \end{pmatrix} \qquad \mathbf{C} = \begin{pmatrix} x \\ y \end{pmatrix}$$

Using cosine formulae at **B**

$$a^2 = b^2 + c^2 - 2bccos\mathbf{A} \tag{1}$$

$$\cos\mathbf{A} = \frac{16 + 81 - 36}{72} \tag{2}$$

$$\cos\mathbf{A} = \frac{61}{72} \tag{3}$$

$$\sin\mathbf{A} = \frac{\sqrt{1463}}{72} \tag{4}$$

$$\mathbf{C} - \mathbf{A} = b\begin{pmatrix} \cos A \\ \sin A \end{pmatrix} \tag{5}$$

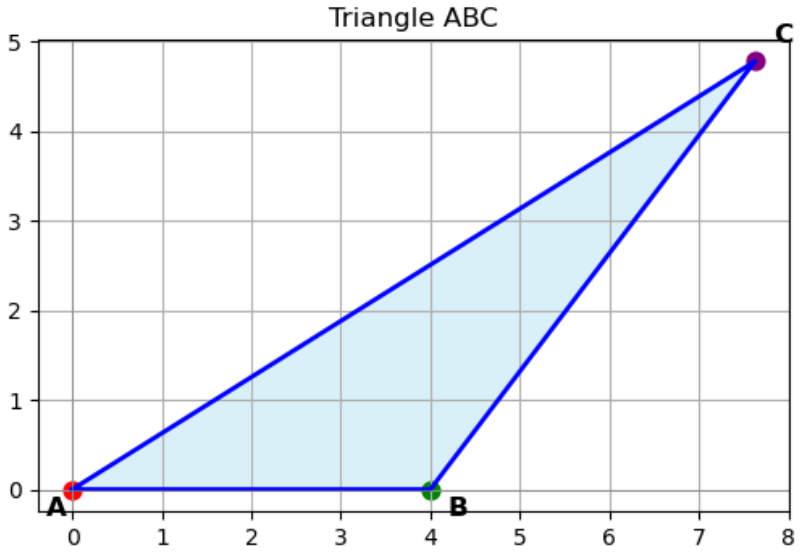
$$\begin{pmatrix} x \\ y \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \end{pmatrix} = 9\begin{pmatrix} \cos A \\ \sin A \end{pmatrix} \tag{6}$$

$$x = \frac{61}{8} \tag{7}$$

$$y = \frac{\sqrt{1463}}{8} \tag{8}$$

The vertices of triangle are $(0,0), (4,0)$ *and* $(7.62, 4.77)$

Refer fig


Triangle ABC
C
A
B
0
1
2
3
4
5
6
7
8