Assignment4

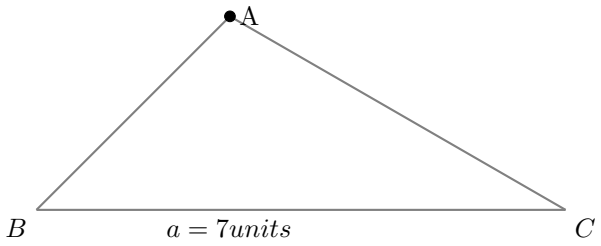
Swapnil Sirsat

January 2021

Question:

Draw ΔABC with a = 7, $\angle$B = 45° and $\angle$A = 105°

Answer:



To construct ΔABC we first need to find $\angle$C
By angle sum property we know that

$$\angle A + \angle B + \angle C = 180^\circ \tag{1}$$

putting values of $\angle$A and $\angle$B in equation 1 we get

$$45^\circ + 105^\circ + \angle C = 180^\circ$$
$$\angle C = 180^\circ - 150^\circ$$
$$\angle C = 30^\circ$$

Now,

$$\angle B = 45^\circ$$
$$\angle C = 30^\circ$$

therefore, line BA and CA would be as

$$x = y \qquad \text{(as B is at (0 , 0))} \tag{2}$$
$$y = \frac{-1}{\sqrt{3}}(x - 7) \qquad \text{(C is at (0,7))} \tag{3}$$

therefore the point of intersection of the two lines by substitution equation 2 in 3

$$y = \frac{-1}{\sqrt{3}}(y - 7)$$
$$y + \frac{1}{\sqrt{3}}y = \frac{7}{\sqrt{3}}$$
$$y = \frac{\frac{7}{\sqrt{3}}}{1 + \frac{1}{\sqrt{3}}}$$
$$y = 2.56$$
$$\implies x = 2.56$$

therefore the coordinates for the triangle taking B at origin would be as

$$A = (2.56, 2.56)$$
$$B = (0, 0)$$
$$C = (0, 7)$$

the constructed figure through matplotlib in python would be as:

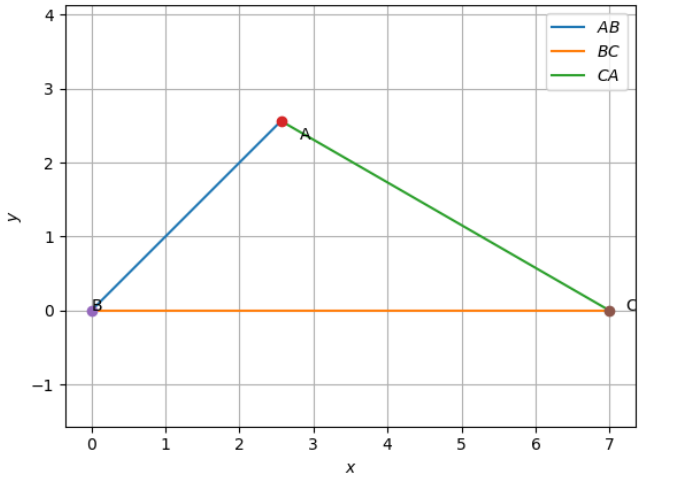


Figure 1: ΔABC