

## Assinment 5

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### Question

Construct a triangle  $\Delta PQR$ ,  $PQ = 3$ ,  $QR = 5.5$  and  $\angle PQR = 60^\circ$

### Answer

Given  $PQ = 3$ ,  $QR = 5.5$  and  $\angle PQR = 60^\circ$

now,

taking Q at (0,0) equation of line PQ

$$y = \sqrt{3}x$$

length of  $PQ = 3$

therefore the point  $(x_1, y_1)$  on line  $y = \sqrt{3}x$  which is 3 units from (0,0)

$$\sqrt{x_1^2 + y_1^2} = 3$$

$$x_1^2 + y_1^2 = 3^2$$

$$x_1^2 + 3x_1^2 = 9$$

$$4x_1^2 = 9$$

$$x_1^2 = \frac{9}{4}$$

$$x_1 = 1.5$$

$$\implies y = \sqrt{3}1.5$$

therefore  $P(1.5, \sqrt{3}1.5)$ ,  $Q(0,0)$ ,  $R(5.5,0)$  are the point for the triangle PQR

The following is the constructed figure

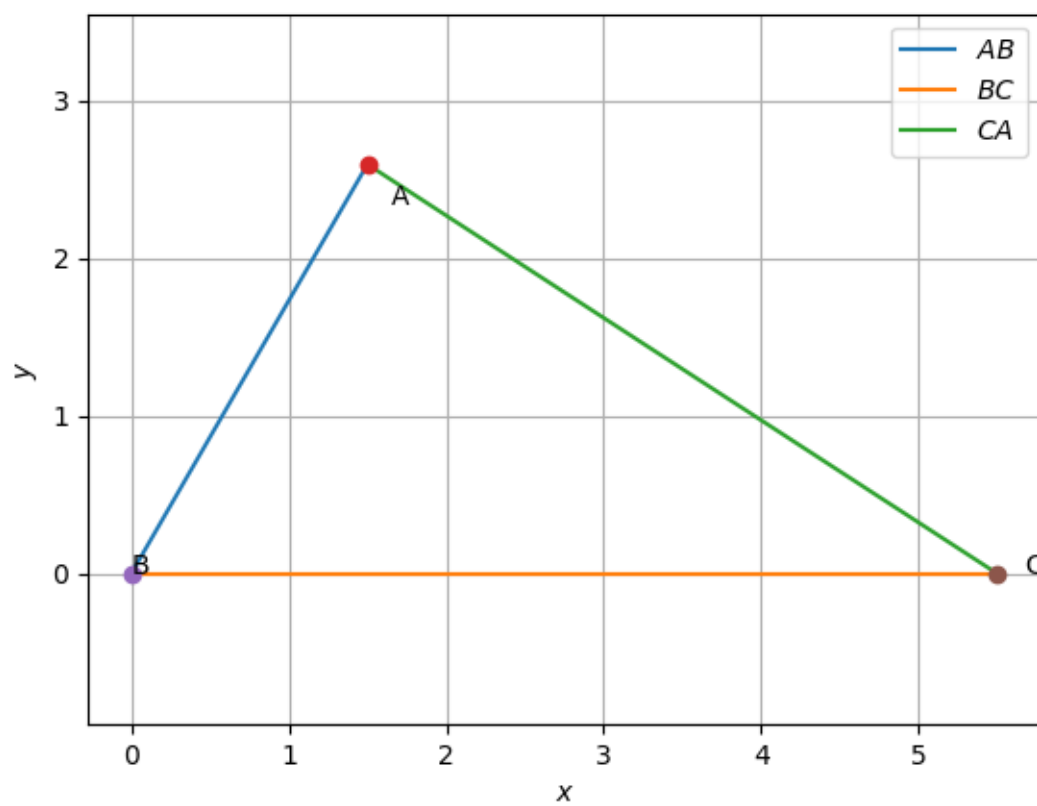


Figure 1: Output of python code

## Question

Construct  $\triangle ABC$  given that  $\angle A = 60^\circ$ ,  $\angle B = 30^\circ$  and  $AB = 5.8$ .

## Answer

Given,

$$\angle A = 60^\circ$$

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

Now, by angle sum property

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\implies \angle C = 90^\circ$$

therefore  $\triangle ABC$  is a right angled triangle

Therefore,

$$\sin A = \frac{BC}{AB} = \frac{a}{5.8}$$

$$\implies a = 5.8 \sin(60)$$

$$\implies a = 5.02$$

$$\cos A = \frac{AC}{AB} = \frac{b}{5.8}$$

$$\implies b = 5.8 \cos(60) = 2.9$$

therefore

$$a = 5.02$$

$$b = 2.9$$

$$c = 5.8$$

Below is the constructed figure

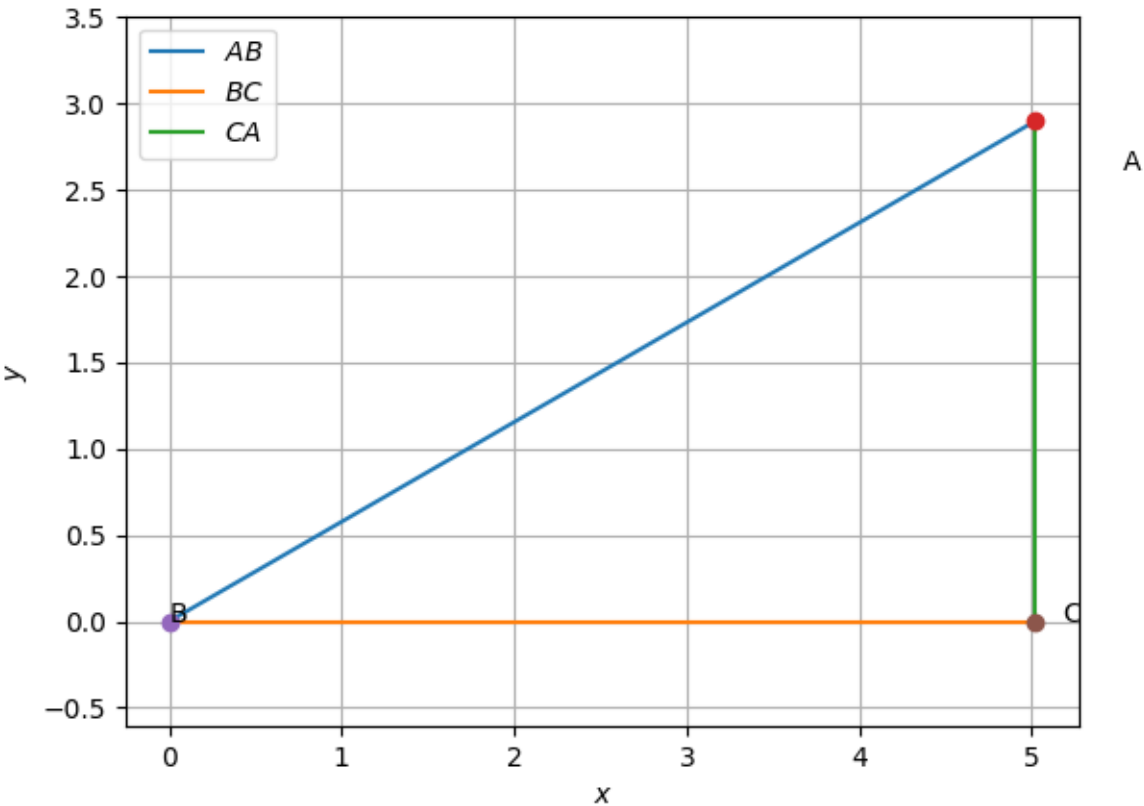


Figure 2: Caption