

Assinment 5

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Question

Construct a triangle ΔPQR , $PQ = 3$, $QR = 5.5$ 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)

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

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

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

$$4x_1^2 = 9$$

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

$$x_1 = 1.5$$

$$\implies y_1 = 1.5\sqrt{3}$$

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

The following is the constructed figure

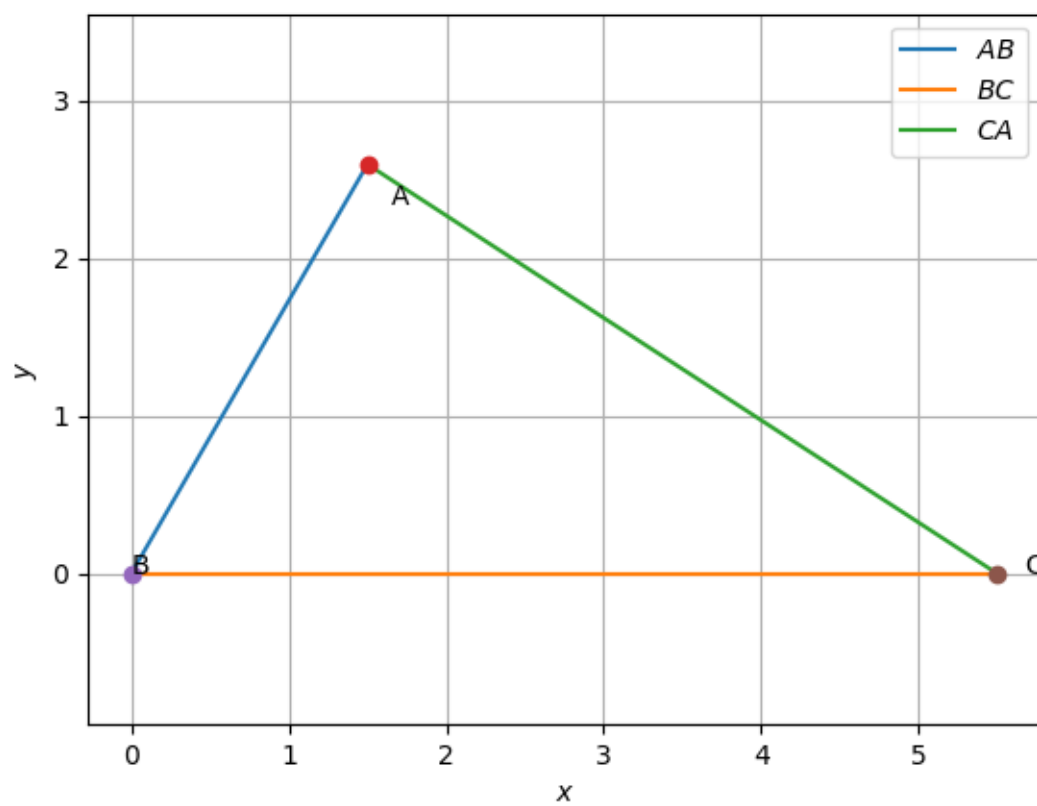


Figure 1: Output of python code

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,

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

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

$$\implies a = 5.02$$

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

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

therefore

$$a = 5.02$$

$$b = 2.9$$

$$c = 5.8$$

Below is the constructed figure

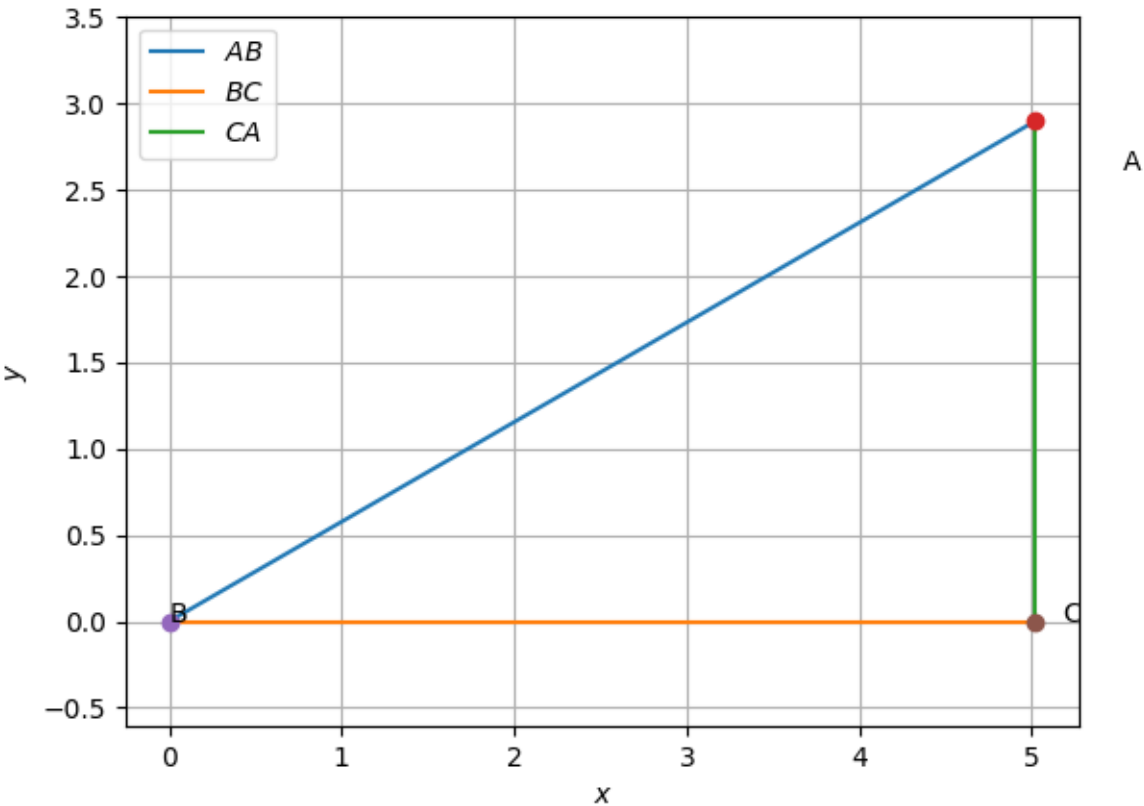


Figure 2: Caption