3.3.11

AI25BTECH11027 - NAGA BHUVANA

September 30, 2025

Question:
Construct a triangle in which $AB = 6cm$,$\angle A = 30^\circ$ and $\angle B = 60^\circ$
Solution:
Let **A** be $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ as $AB = 6cm$ position vector of **B** be $\begin{pmatrix} 6 \\ 0 \end{pmatrix}$
Property:
Sum of angles in a triangle is 180°

$$\angle A + \angle B + \angle C = 180^\circ \tag{0.1}$$

$$30^\circ + 60^\circ + \angle C = 180^\circ \tag{0.2}$$

$$\angle C = 90^\circ \tag{0.3}$$

Use sin rule

$$\frac{AB}{\sin 90^\circ} = \frac{AC}{\sin 60^\circ} = \frac{BC}{\sin 30^\circ} \tag{0.4}$$

$$AC = 6\sin 60^\circ \tag{0.5}$$

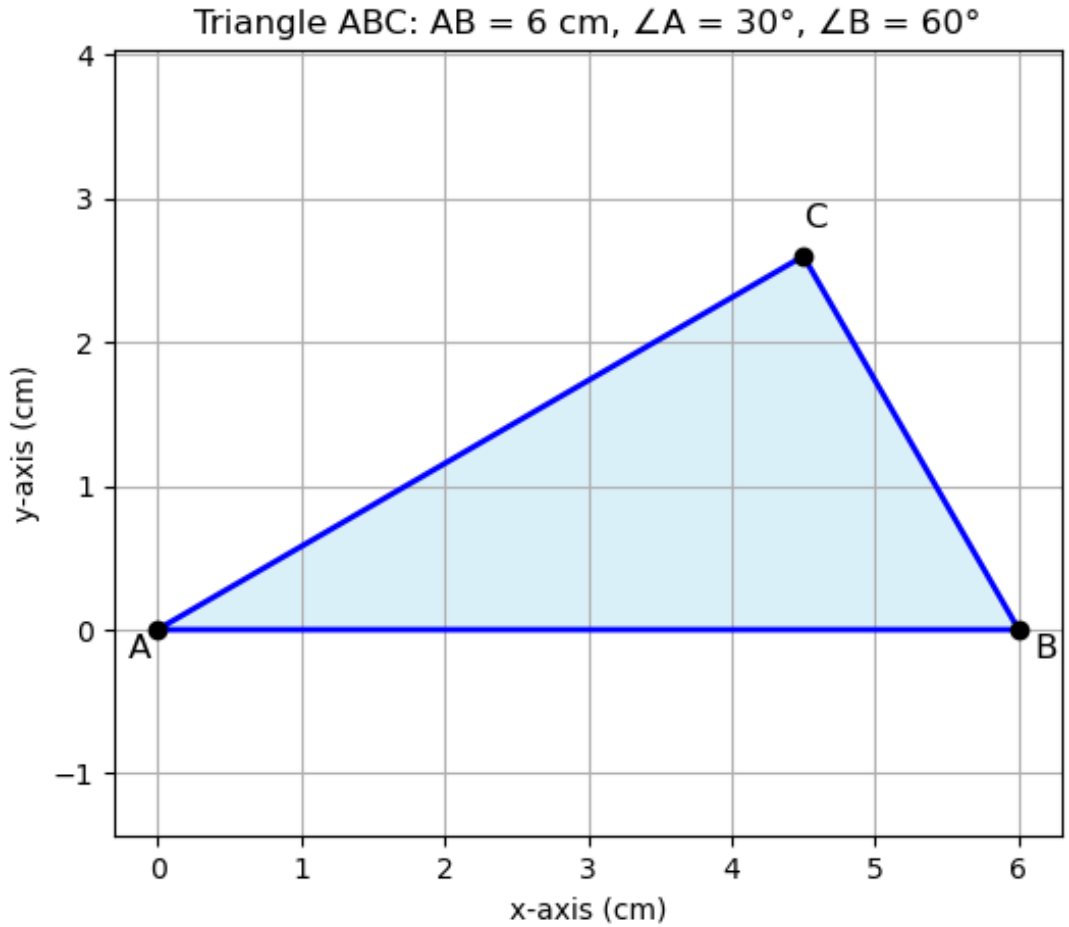
$$\implies AC = 3\sqrt{3} \tag{0.6}$$

$$BC = 6\sin 30^\circ \tag{0.7}$$

$$\implies BC = 3 \tag{0.8}$$

$$\mathbf{C} = \begin{pmatrix} 3\sqrt{3}\cos 30^\circ \\ 3\sqrt{3}\sin 30^\circ \end{pmatrix} \tag{0.9}$$

$$\mathbf{C} = \begin{pmatrix} \frac{9}{2} \\ \frac{3\sqrt{3}}{2} \end{pmatrix} \tag{0.10}$$


Triangle ABC: AB = 6 cm, ∠A = 30°, ∠B = 60°
C
A
B
y-axis (cm)
x-axis (cm)
4
3
2
1
0
−1
0
1
2
3
4
5
6