3.3.11

AI25BTECH11027 - NAGA BHUVANA

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°

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

$$30^\circ + 60^\circ + \angle C = 180^\circ \tag{2}$$

$$\angle C = 90^\circ \tag{3}$$

Use sin rule

$$\frac{AB}{\sin 90^\circ} = \frac{AC}{\sin 60^\circ} = \frac{BC}{\sin 30^\circ} \tag{4}$$

$$AC = 6\sin 60^\circ \tag{5}$$

$$\implies AC = 3\sqrt{3} \tag{6}$$

$$BC = 6\sin 30^\circ \tag{7}$$

$$\implies BC = 3 \tag{8}$$

$$\mathbf{C} = \begin{pmatrix}3\sqrt{3}\cos 30^\circ\\3\sqrt{3}\sin 30^\circ\end{pmatrix} \tag{9}$$

$$\mathbf{C} = \begin{pmatrix}\frac{9}{2}\\\frac{3\sqrt{3}}{2}\end{pmatrix} \tag{10}$$

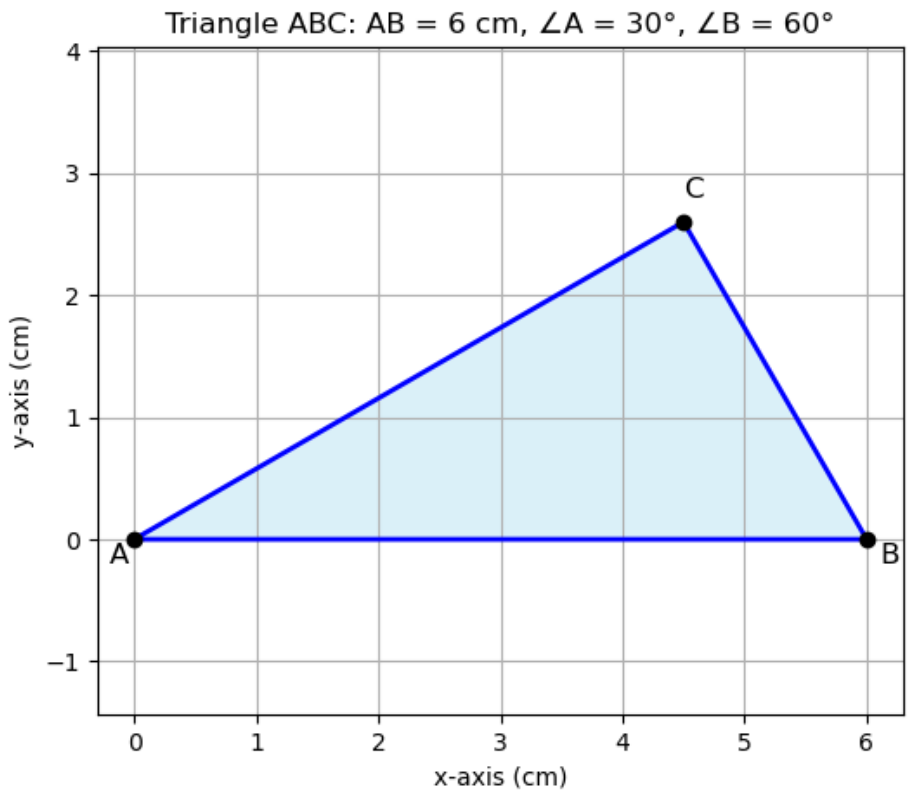
Triangle ABC: AB = 6 cm, ∠A = 30°, ∠B = 60°
y-axis (cm)
x-axis (cm)
A
B
C
4
3
2
1
0
−1
0
1
2
3
4
5
6

Fig. 1