3.3.2

AI25BTECH11018-Hemanth Reddy

Question:
Construct a triangle with sides 5cm, 6cm and 7cm.

Solution:
Let triangle be $\triangle ABC$
Let AB=5cm BC=6cm CA=7cm
Take

$$\mathbf{A}\begin{pmatrix}0\\0\end{pmatrix},\mathbf{B}\begin{pmatrix}5\\0\end{pmatrix},\ \mathbf{C}\begin{pmatrix}7\cos A\\7\sin A\end{pmatrix}$$

$$cos\mathbf{A} = \frac{AB^2 + AC^2 - BC^2}{2 \cdot AB \cdot AC} \tag{0.1}$$

$$cos\mathbf{A} = \frac{5^2 + 7^2 - 6^2}{2 \cdot 5 \cdot 7} = \frac{19}{35} \tag{0.2}$$

$$\sin A = \frac{12\sqrt{6}}{35} \tag{0.3}$$

Therefore

$$\mathbf{C}\begin{pmatrix}7 \cdot \frac{19}{35} & 7 \cdot \frac{12\sqrt{6}}{35}\end{pmatrix} \tag{0.4}$$

$$\mathbf{C}\begin{pmatrix}\frac{19}{5} & , \frac{12\sqrt{6}}{5}\end{pmatrix} \tag{0.5}$$

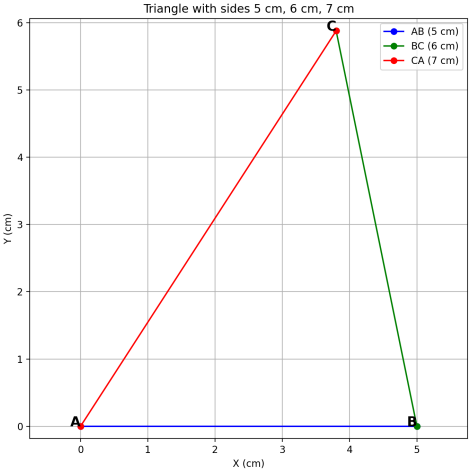
Triangle with sides 5 cm, 6 cm, 7 cm
AB (5 cm)
BC (6 cm)
CA (7 cm)
A
B
C
X (cm)
Y (cm)
0
1
2
3
4
5
6

Fig. 0.1