3.2.5

EE25BTECH11064 - Yojit Manral

Question:
Draw a triangle ABC in which BC = 6 cm, CA = 5 cm and AB = 4 cm.
Solution:
→ Let

$$a = \|\mathbf{C} - \mathbf{B}\| = 6cm \tag{1}$$
$$b = \|\mathbf{A} - \mathbf{C}\| = 5cm \tag{2}$$
$$c = \|\mathbf{B} - \mathbf{A}\| = 4cm \tag{3}$$

→ By using cosine law in △ABC, we get

$$\cos B = \frac{a^2 + c^2 - b^2}{2ac} \tag{4}$$
$$\implies \cos B = \frac{6^2 + 4^2 - 5^2}{2 \times 6 \times 4} \tag{5}$$
$$\implies \cos B = \frac{9}{16} \tag{6}$$
$$\implies \angle B = \cos^{-1}\left(\frac{9}{16}\right) \approx 55° \tag{7}$$

→ The coordinates of △ABC can then be expressed as

$$\mathbf{A} = c\begin{pmatrix}\cos B \\ \sin B\end{pmatrix} \tag{8}$$
$$\mathbf{B} = \begin{pmatrix}0 \\ 0\end{pmatrix} \tag{9}$$
$$\mathbf{C} = \begin{pmatrix}0 \\ 6\end{pmatrix} \tag{10}$$

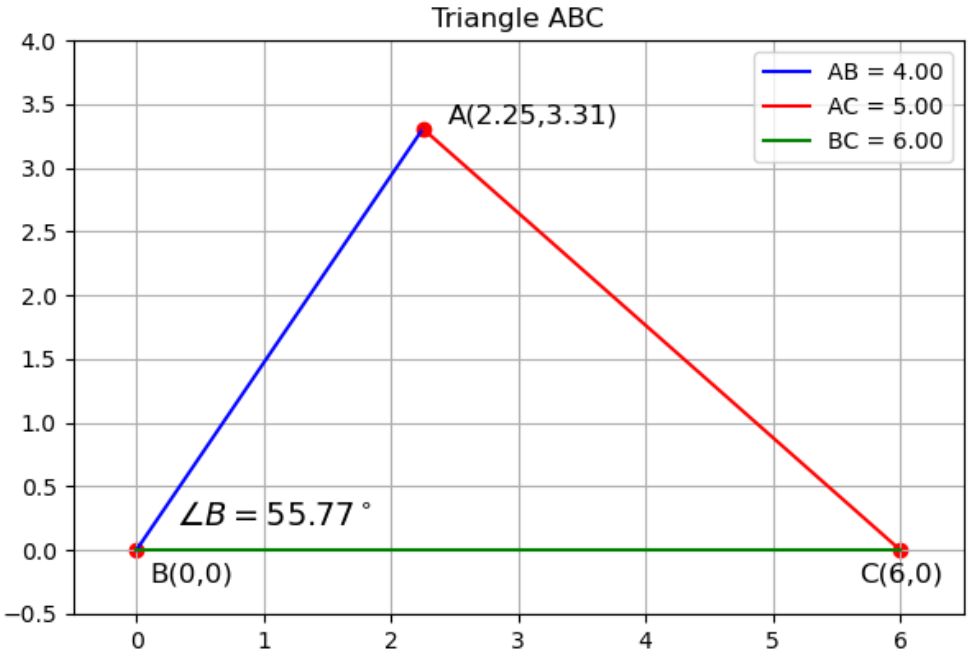

Fig. 0: Plot of △ABC