Assignment 1

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Download all python codes from

https://https://github.com/Sowmyabandi99/Assignment1/blob/main/assignment1.py

and latex-tikz codes from

https://https://github.com/Sowmyabandi99/Assignment1/blob/main/main.tex

1 Question No.2.7

In $\triangle ABC$, $a = 8, \angle B = 45^\circ$ and $c - b = 3.5$. Sketch $\triangle ABC$.

2 SOLUTION

The vertex **A** can be expressed in *polar coordinate form* as

$$\mathbf{A} = c\begin{pmatrix}\cos\theta\\ \sin\theta\end{pmatrix}, \mathbf{B} = \begin{pmatrix}0\\0\end{pmatrix}, \mathbf{C} = \begin{pmatrix}a\\0\end{pmatrix}, \tag{2.0.1}$$

where

$$c = \sqrt{a^2 + b^2}, \theta = 45^\circ \tag{2.0.2}$$

Therefore,

$$c^2 = a^2 + b^2 \tag{2.0.3}$$

$$c^2 = 8^2 + (c - 3.5)^2 \quad (\because c - b = 3.5) \tag{2.0.4}$$

$$c^2 = 64 + c^2 + 12.25 - 7c \tag{2.0.5}$$

$$76.25 - 7c = 0 \tag{2.0.6}$$

$$c = 10.89 \tag{2.0.7}$$

so,the vertices of $\triangle ABC$ are

$$\mathbf{A} = 10.89\begin{pmatrix}\cos 45\\ \sin 45\end{pmatrix} = \begin{pmatrix}5.66\\9.25\end{pmatrix}, \mathbf{B} = \begin{pmatrix}0\\0\end{pmatrix}, \mathbf{C} = \begin{pmatrix}8\\0\end{pmatrix} \tag{2.0.8}$$

Plot of the $\triangle ABC$:

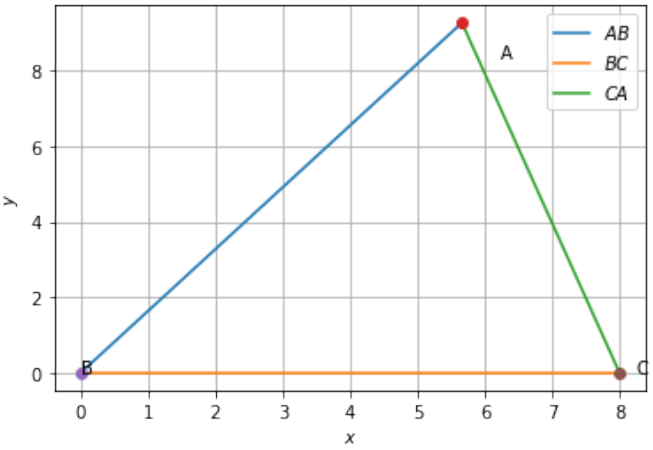

Fig. 2.1: $\triangle ABC$