

Assignment 1

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Download all python codes from

<https://github.com/BatharajuRamana/Assignment1/blob/main/Assignment1/assignment1.py>

and latex-tikz codes from

<https://github.com/BatharajuRamana/Assignment1/blob/main/Assignment1/main.tex>

1 QUESTION No. 2.20

Draw $\triangle ABC$ with side $\angle B = 30^\circ$, $\angle A = 60^\circ$, $AB = 5.8$.

2 EXPLANATION

Given,

$$\angle A = 60^\circ, \angle B = 30^\circ \text{ and } AB = 5.8 \quad (2.0.1)$$

we first need to find $\angle C$:

Finding $\angle C$

In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ \quad (2.0.2)$$

$$60^\circ + 30^\circ + \angle C = 180^\circ \quad (2.0.3)$$

$$\angle C = 180^\circ - 90^\circ \quad (2.0.4)$$

$$\angle C = 90^\circ \quad (2.0.5)$$

That is, the $\triangle ABC$ is a Right angled. let $AB = c$ and $\theta = 30^\circ$. Then the sides of the triangle can be obtained by

$$BC = c \cos \theta \quad (2.0.6)$$

$$AC = c \sin \theta \quad (2.0.7)$$

Now, vertices of given $\triangle ABC$ can be written as,

$$\mathbf{A} = \begin{pmatrix} 0 \\ c \sin \theta \end{pmatrix} \quad (2.0.8)$$

$$= \begin{pmatrix} 0 \\ 5.8 \sin 30^\circ \end{pmatrix} \quad (2.0.9)$$

$$= \begin{pmatrix} 0 \\ 2.9 \end{pmatrix} \quad (2.0.10)$$

$$\mathbf{B} = \begin{pmatrix} c \cos \theta \\ 0 \end{pmatrix} \quad (2.0.11)$$

$$= \begin{pmatrix} 5.8 \cos 30^\circ \\ 0 \end{pmatrix} \quad (2.0.12)$$

$$= \begin{pmatrix} 5.02294 \\ 0 \end{pmatrix} \quad (2.0.13)$$

$$\mathbf{C} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (2.0.14)$$

Now, $\triangle ABC$ can be plotted using vertices a, b and c
Plot of the angle $\triangle ABC$:

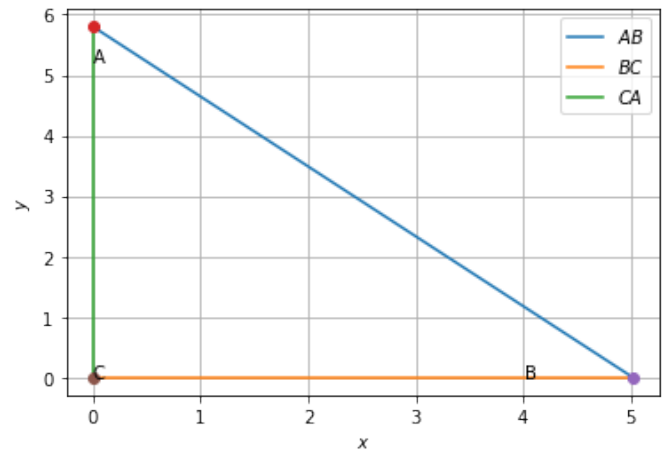


Fig. 2.1: $\triangle ABC$