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

2 Explanation

Given,

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

we first need to find $\angle C$:
Finding $\angle C$
In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ \tag{2.0.2}$$
$$60^\circ + 30^\circ + \angle C = 180^\circ \tag{2.0.3}$$
$$90^\circ + \angle C = 180^\circ \tag{2.0.4}$$
$$\angle C = 180^\circ - 90^\circ \tag{2.0.5}$$
$$\angle C = 90^\circ \tag{2.0.6}$$

$$BC = AB \cdot \cos 30^\circ \tag{2.0.7}$$
$$a = c \cdot \cos 30^\circ \tag{2.0.8}$$
$$a = 5.8 \cdot \cos 30^\circ \tag{2.0.9}$$
$$a = 5.02294 \tag{2.0.10}$$

we have:

$$AC = AB \cdot \sin 30^\circ \tag{2.0.11}$$
$$b = c \cdot \sin 30^\circ \tag{2.0.12}$$
$$b = 5.8 \cdot \sin 30^\circ \tag{2.0.13}$$
$$b = 2.9 \tag{2.0.14}$$

we get values :

$$\implies a = 5.02294; \tag{2.0.15}$$
$$\implies b = 2.9; \tag{2.0.16}$$
$$\implies c = 5.8; \tag{2.0.17}$$

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

$$\mathbf{A} = \begin{pmatrix} 0 \\ c \end{pmatrix} = \begin{pmatrix} 0 \\ 5.8 \end{pmatrix} \tag{2.0.18}$$
$$\mathbf{B} = \begin{pmatrix} a \\ 0 \end{pmatrix} = \begin{pmatrix} 5.02294 \\ 0 \end{pmatrix} \tag{2.0.19}$$
$$\mathbf{C} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \tag{2.0.20}$$

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

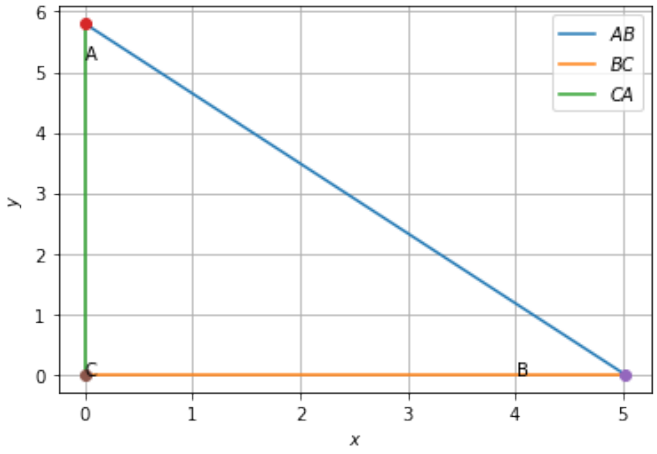

Fig. 2.1: $\triangle ABC$