Assignment-1

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Download all python codes from

https://github.com/Kumarbegnier/IIT−HYD−INTERNSHIP/tree/main/ASSIGNMENT%201/code

and latex-tikz codes from

https://github.com/Kumarbegnier/IIT−HYD−INTERNSHIP/blob/main/ASSIGNMENT%201/Latex.tex

1 Question No. 2.18

Construct $\triangle XYZ$ given that XY=6 $\angle X = 30°$ and $\angle Y = 100°$

2 Solution

Given,

$$XY = 6 \angle X = 30° \angle Y = 100° \tag{2.0.1}$$

$$XY = c, YZ = a, XZ = b \tag{2.0.2}$$

$$\tag{2.0.3}$$

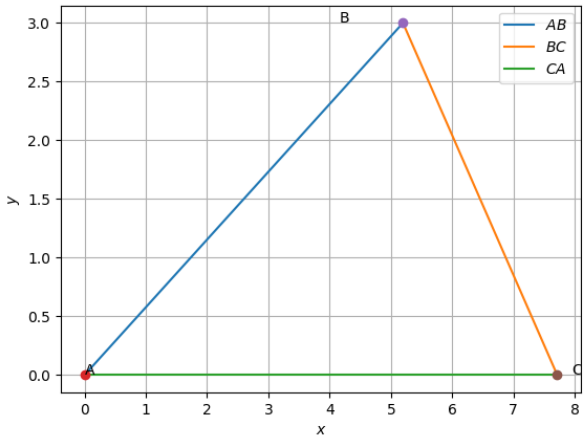

Fig. 0: OUTPUT FIGURE

Angle Sum Property

$$\angle Z° = \angle 180° - \angle X° + \angle Y° \tag{2.0.4}$$

The vertex X,Y and Z can be expressed in polar coordinate form as:

$$\mathbf{X} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \mathbf{Y} = \begin{pmatrix} p \\ q \end{pmatrix} \mathbf{Z} = \begin{pmatrix} b \\ 0 \end{pmatrix} \tag{2.0.5}$$

This can be written as,

$$\mathbf{X} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \tag{2.0.6}$$

$$\mathbf{Y} = 6\begin{pmatrix} \cos 30 \\ \sin 30 \end{pmatrix} = \begin{pmatrix} 3\sqrt{3} \\ 3 \end{pmatrix}, \tag{2.0.7}$$

$$\mathbf{Z} = \begin{pmatrix} P + (q/tan\theta) \\ 0 \end{pmatrix} = \begin{pmatrix} 3\sqrt{3} + (3/\tan 50) \\ 0 \end{pmatrix} \tag{2.0.8}$$

These values of A, B and C are substituted with respect to X, Y and Z the triangle in code.