

ASSIGNMENT-1

Neeraj Kumar

download all python codes from

https://github.com/Kumarbegnier/IIT-HYD-INTERNSHIP/tree/main/ASSIGNMENT_201/code

latex-tikz codes from

https://github.com/Kumarbegnier/IIT-HYD-INTERNSHIP/blob/main/ASSIGNMENT_201/Latex.tex

1 QUESTION NO-2.19

If $XY = 6, \angle X = 30^\circ$ and $\angle Y = 100^\circ$. Can you draw a triangle?

2 SOLUTION

$$\text{Given, } XY = 6, \angle X = 30^\circ, \angle Y = 100^\circ \quad (2.0.1)$$

$$\text{Let, } XY = z, \quad YZ = x, \quad XZ = y \quad (2.0.2)$$

Angle Sum Property

$$\angle Z^\circ = \angle 180^\circ - \angle X^\circ + \angle Y^\circ \quad (2.0.3)$$

$$\angle Z^\circ = \angle 50^\circ \quad (2.0.4)$$

To find the side y by using the formula

$$\frac{\sin X}{x} = \frac{\sin Y}{y} = \frac{\sin Z}{z} \quad (2.0.5)$$

written as,

$$y = z \left(\frac{\sin Y}{\sin Z} \right) = 6 \left(\frac{\sin 100^\circ}{\sin 50^\circ} \right) = 7.7134 \quad (2.0.6)$$

The vertex of Y can be expressed in polar coordinate.

$$\mathbf{X} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}, \mathbf{Y} = 6 \begin{pmatrix} \cos 30^\circ \\ \sin 30^\circ \end{pmatrix}, \mathbf{Z} = \begin{pmatrix} 7.7134 \\ 0 \end{pmatrix} \quad (2.0.7)$$

The values of X, Y and Z are substituted and the triangle is plotted as given above.

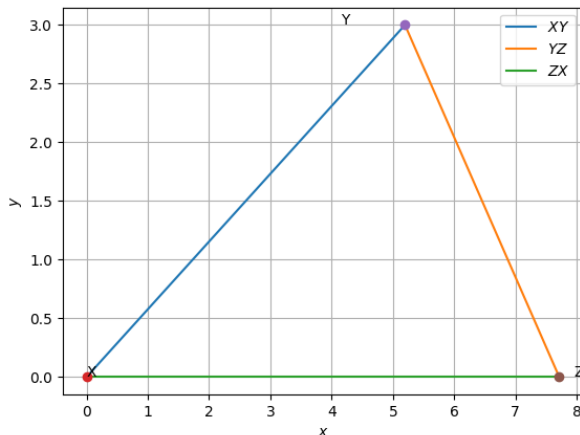


Fig. 0: Constructed Triangle