1.10.28

EE25BTECH11060 - V.Namaswi

Question:
Write a unit vector in **XY** plane making an angle 30°with positive direction of **X** axis

Solution:
Given a vector,
Angle made by the vector with X axis = 30°
Angle made by the vector with Y axis =90°-30°=60°
Angle made by the vector with Z axis =90°

Axis	Angle (in degrees)
X-axis	30°
Y-axis	60°
Z-axis	0°

TABLE 0: Angles made by the X, Y, Z axes

Unit vector is given by

$$\implies \begin{pmatrix} cos30° \\ cos60° \\ cos90° \end{pmatrix}$$

$$\implies \begin{pmatrix} \frac{\sqrt{3}}{2} \\ \frac{1}{2} \\ 0 \end{pmatrix}$$

The unit vector of the given vector is given by

$$\frac{1}{2}\begin{pmatrix} \sqrt{3} \\ 1 \\ 0 \end{pmatrix}$$

Refer Fig

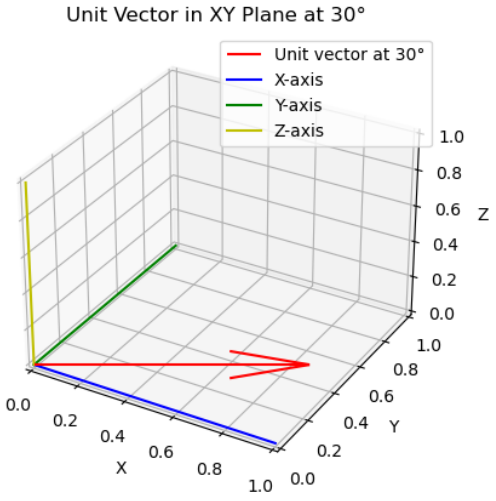
Unit Vector in XY Plane at 30°
Unit vector at 30°
X-axis
Y-axis
Z-axis
X
Y
Z
0.0
0.2
0.4
0.6
0.8
1.0

Fig. 0: Plot