

Q.2)  $Z = x_1 \underline{y}_1 + x_2 \underline{y}_2 + x_3 \underline{y}_3$

unit norm vector  $\underline{Y} = [\underline{y}_1, \underline{y}_2, \underline{y}_3]$

$$\underline{Y} \equiv [\sin \alpha \cos \beta, \sin \alpha \sin \beta, \cos \alpha]$$

$$\begin{aligned} \therefore Z &= x_1 \sin \alpha \cos \beta + x_2 \sin \alpha \sin \beta + x_3 \cos \alpha \\ &= x_3 \cos \alpha + (x_1 \cos \beta + x_2 \sin \beta) \sin \alpha \\ &= \text{Rot}_\alpha(x_3, \text{Rot}_\alpha(x_1, x_2, \beta), \alpha) \quad \text{--- (1)} \end{aligned}$$

We will find  $\alpha$  &  $\beta$  using Rotation mode.

$$\beta = \text{Vec}_0(y_1, y_2) \quad \text{--- (2)}$$

~~do Vec\_0 Vec\_0(y\_1, y\_2)~~

$$\alpha = \text{Vec}_0(\text{Vec}_y(y_1, y_2), y_3) \quad \text{--- (3)}$$

