Cubo giratório em C.

1- Procurar cálculo das matrizes em três dimensões (wikipédia tem)

$$R_x(\theta) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos\theta & -\operatorname{sen}\theta \\ 0 & \operatorname{sen}\theta & \cos\theta \end{bmatrix}$$

$$R_y(\theta) = \begin{bmatrix} \cos\theta & 0 & \operatorname{sen}\theta \\ 0 & 1 & 0 \\ -\operatorname{sen}\theta & 0 & \cos\theta \end{bmatrix}$$

$$R_z(\theta) = \begin{bmatrix} \cos\theta & -\operatorname{sen}\theta & 0 \\ \operatorname{sen}\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

2-) Ir ao symbolab ou qualquer outro app de matemática e calcular as coordenadas. (usando symbolab ficaria assim:)

$$\begin{array}{c} x \quad\; y \quad\; z \\ (\,i\,,\; j\,,\; k\,) \end{array} \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos(A) & -\operatorname{sen}(A) \\ 0 & \operatorname{sen}(A) & \cos(A) \end{pmatrix} \begin{pmatrix} \cos(B) & 0 & \operatorname{sen}(B) \\ 0 & 1 & 0 \\ -\operatorname{sen}(B) & 0 & \cos(B) \end{pmatrix} \begin{pmatrix} \cos(C) & \operatorname{sen}(C) & 0 \\ \operatorname{sen}(C) & \cos(C) & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

Resultado:

$$= j\sin(A)\sin(B)\cos(C) - k\cos(A)\sin(B)\cos(C) + j\cos(A)\sin(C) + i\,(\cos(B)\cos(C) + \mathrm{KAsmsin}(C))$$

$$J\sin(A)\sin(B)\sin(C) - K\cos(A)\sin(B)\sin(C) + J\cos(A)\cos(C) + i\,(\cos(B)\sin(C) + \mathrm{KAsmcos}(C))$$

$K\cos(A)\cos(B)$
$-J\sin(A)\cos(B)$
$+i\sin(B)$

3 - Criar documento no VsCode ou qualquer outro que tu use.

4 - $R_y(\theta) = \begin{bmatrix} \cos\theta & 0 & \text{sen}\,\theta \\ 0 & 1 & 0 \\ -\text{sen}\,\theta & 0 & \cos\theta \end{bmatrix}$

=

$(x \quad y \quad z)\begin{pmatrix} \cos(90) & 0 & \text{sen}(90) \\ 0 & 1 & 0 \\ -\text{sen}(90) & 0 & \cos(90) \end{pmatrix}$

=

$(-z \quad y \quad x)$ → um dos calculos de superfície

$(x \quad y \quad z)\begin{pmatrix} \cos(-90^\circ) & 0 & -\text{sen}(-90^\circ) \\ 0 & 1 & 0 \\ -\text{sen}(-90^\circ) & 0 & -\cos(-90^\circ) \end{pmatrix}$

=

$(z \quad y \quad -x)$ → um dos calculos de superfície

$(x \quad y \quad z)\begin{pmatrix} \cos(180) & 0 & \text{sen}(180) \\ 0 & 1 & 0 \\ -\text{sen}(180) & 0 & \cos(180) \end{pmatrix}$

$=$

$(-x \quad y \quad -z) \rightarrow$ Um dos calculos da superficie

$$(x \quad y \quad z)\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos(90) & -\operatorname{sen}(90) \\ 0 & \operatorname{sen}(90) & \cos(90) \end{pmatrix}$$

$=$

$(x \quad z \quad -y) \rightarrow$ Um dos calculos de superficie

$$(x \quad y \quad z)\begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos(-90) & -\operatorname{sen}(-90) \\ 0 & \operatorname{sen}(-90) & \cos(-90) \end{pmatrix}$$

$=$

$(x \quad -z \quad y) \rightarrow$ Um dos calculos da superficie