

MeshPlot

Euler Rotation

EulerRot(v) returns the Euler rotation matrix.

$$EulerRot(v) := \left| \text{eval} \left( \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos(v_1) & -\sin(v_1) \\ 0 & \sin(v_1) & \cos(v_1) \end{bmatrix} \cdot \begin{bmatrix} \cos(v_2) & 0 & \sin(v_2) \\ 0 & 1 & 0 \\ -\sin(v_2) & 0 & \cos(v_2) \end{bmatrix} \cdot \begin{bmatrix} \cos(v_3) & -\sin(v_3) & 0 \\ \sin(v_3) & \cos(v_3) & 0 \\ 0 & 0 & 1 \end{bmatrix} \right) \right|$$

$$Proj_2(M) := \left| M \right|_{[1..rows(M)][1..2]} \quad Proj_2(K, v) := \left| \text{eval}(Proj_2(K \cdot EulerRot(v))) \right|$$

$$Axis3D(x, y, z) := \begin{bmatrix} 0 & 0 & 0 \\ x & 0 & 0 \\ 0 & 0 & 0 \\ 0 & y & 0 \\ 0 & 0 & 0 \\ 0 & 0 & z \\ 0 & 0 & 0 \end{bmatrix}$$

Torus Example

$$T(u, v) := \begin{bmatrix} (R + r \cdot \cos(u)) \cdot \cos(v) \\ (R + r \cdot \cos(u)) \cdot \sin(v) \\ r \cdot \sin(u) \end{bmatrix} \quad \begin{array}{l} R := 6 \\ r := 2 \end{array}$$

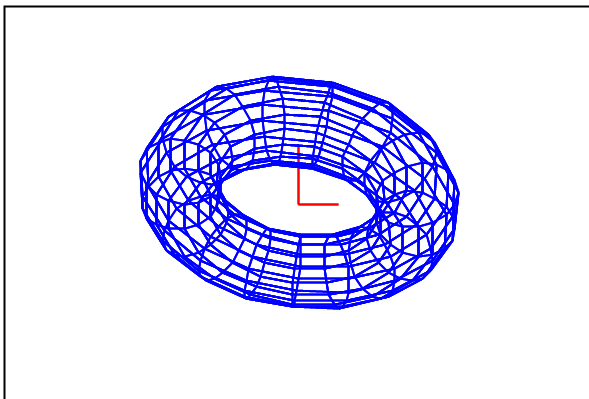
$$\Omega := [30^\circ \ 45^\circ \ 60^\circ]$$

$$\gamma := EulerRot(\Omega)$$

$$A := Axis3D(2, 3, 4)$$

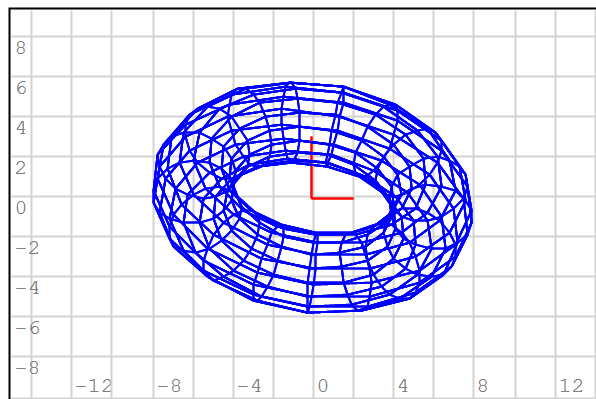
$$T := MeshPlot(T(u, v), 0, 2 \cdot \pi, 18, 0, 2 \cdot \pi, 18)$$

3D Plot



$$\begin{cases} T \cdot \gamma \\ A \end{cases}$$

2D Plot



$$\begin{cases} Proj_2(T, \Omega) \\ Proj_2(A) \end{cases}$$

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