

## Gráficos de Sólidos de Revolução

Rotacionando a curva parametrizada em torno de um eixo **x**

$$\begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos(\beta) - \text{sen}(\beta) & \\ 0 & \text{sen}(\beta) & \cos(\beta) \end{vmatrix} \cdot \begin{vmatrix} x \\ y \\ 0 \end{vmatrix} = \begin{vmatrix} x+0+0 \\ 0+\cos(\beta)y+0 \\ 0+\text{sen}(\beta)y+0 \end{vmatrix} = \begin{vmatrix} x \\ \cos(\beta)y \\ \text{sen}(\beta)y \end{vmatrix} = (x, \cos(\beta)y, \text{sen}(\beta)y)$$

$$\begin{vmatrix} 1 & 0 & 0 \\ 0 & \cos(\beta) - \text{sen}(\beta) & \\ 0 & \text{sen}(\beta) & \cos(\beta) \end{vmatrix} \cdot \begin{vmatrix} x \\ 0 \\ z \end{vmatrix} = \begin{vmatrix} x+0+0 \\ 0+0-\text{sen}(\beta)z \\ 0+0+\cos(\beta)z \end{vmatrix} = \begin{vmatrix} x \\ -\text{sen}(\beta)z \\ \cos(\beta)z \end{vmatrix} = (x, -\text{sen}(\beta)z, \cos(\beta)z)$$

Rotacionando a curva parametrizada em torno de um eixo **y**

$$\begin{vmatrix} \cos(\beta) & 0 & \text{sen}(\beta) \\ 0 & 1 & 0 \\ -\text{sen}(\beta) & 0 & \cos(\beta) \end{vmatrix} \cdot \begin{vmatrix} x \\ y \\ 0 \end{vmatrix} = \begin{vmatrix} \cos(\beta)x+0+0 \\ 0+y+0 \\ -\text{sen}(\beta)x+0+0 \end{vmatrix} = \begin{vmatrix} \cos(\beta)x \\ y \\ -\text{sen}(\beta)x \end{vmatrix} = (\cos(\beta)x, y, -\text{sen}(\beta)x)$$

$$\begin{vmatrix} \cos(\beta) & 0 & \text{sen}(\beta) \\ 0 & 1 & 0 \\ -\text{sen}(\beta) & 0 & \cos(\beta) \end{vmatrix} \cdot \begin{vmatrix} 0 \\ y \\ z \end{vmatrix} = \begin{vmatrix} 0+0+\text{sen}(\beta)z \\ 0+y+0 \\ 0+0+\cos(\beta)z \end{vmatrix} = \begin{vmatrix} \text{sen}(\beta)z \\ y \\ \cos(\beta)z \end{vmatrix} = (\text{sen}(\beta)z, y, \cos(\beta)z)$$

Rotacionando a curva parametrizada em torno de um eixo **z**

$$\begin{vmatrix} \cos(\beta) - \text{sen}(\beta) & 0 \\ \text{sen}(\beta) & \cos(\beta) \\ 0 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} x \\ 0 \\ z \end{vmatrix} = \begin{vmatrix} \cos(\beta)x+0+0 \\ \text{sen}(\beta)x+0+0 \\ 0+0+z \end{vmatrix} = \begin{vmatrix} \cos(\beta)x \\ \text{sen}(\beta)x \\ z \end{vmatrix} = (\cos(\beta)x, \text{sen}(\beta)x, z)$$

$$\begin{vmatrix} \cos(\beta) - \text{sen}(\beta) & 0 \\ \text{sen}(\beta) & \cos(\beta) \\ 0 & 0 & 1 \end{vmatrix} \cdot \begin{vmatrix} 0 \\ y \\ z \end{vmatrix} = \begin{vmatrix} 0 - \text{sen}(\beta)y + 0 \\ 0 + \cos(\beta)y + 0 \\ 0 + 0 + z \end{vmatrix} = \begin{vmatrix} -\text{sen}(\beta)y \\ \cos(\beta)y \\ z \end{vmatrix} = (-\text{sen}(\beta)y, \cos(\beta)y, z)$$