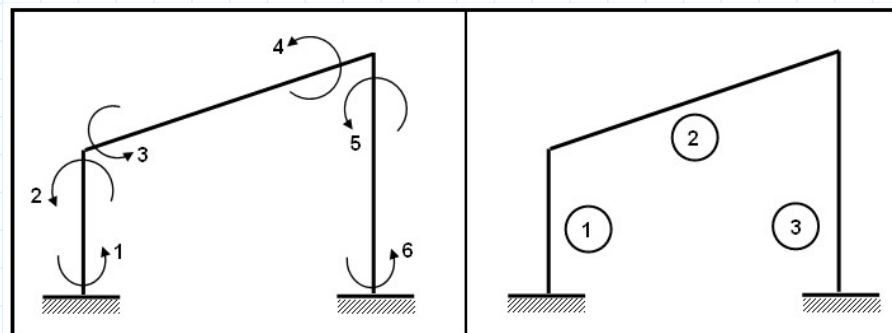
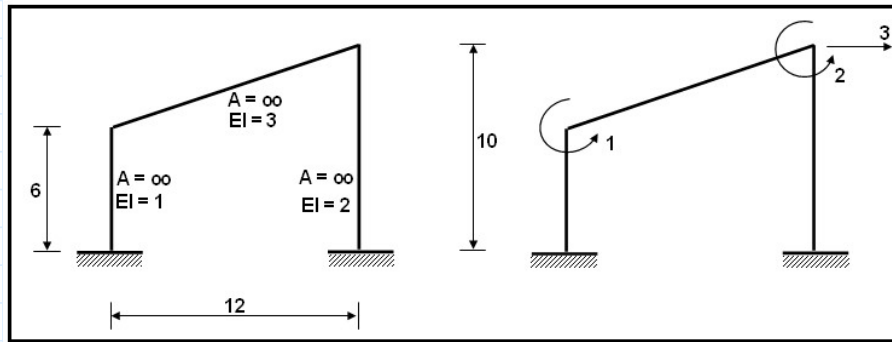




$$L1 := 6 \quad L2 := \sqrt{12^2 + 4^2} = 12.649 \quad L3 := 10$$

$$EI1 := 1 \quad EI2 := 3 \quad EI3 := 2$$

$$A := \begin{bmatrix} 0 & 0 & \frac{1}{6} \\ 1 & 0 & \frac{1}{6} \\ 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & \frac{1}{10} \\ 0 & 0 & \frac{1}{10} \end{bmatrix}$$

Por ser un sistema axialmente rígido, la matriz de rigidez para cada elemento es:

$$k = \begin{bmatrix} \frac{4 EI}{L} & \frac{2 EI}{L} \\ \frac{2 EI}{L} & \frac{4 EI}{L} \end{bmatrix} = \frac{2 EI}{L} \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$$

$$k1 := \frac{2 EI1}{L1} \cdot \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 0.667 & 0.333 \\ 0.333 & 0.667 \end{bmatrix} \quad k2 := \frac{2 EI2}{L2} \cdot \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 0.949 & 0.474 \\ 0.474 & 0.949 \end{bmatrix}$$

$$k3 := \frac{2 EI3}{L3} \cdot \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 0.8 & 0.4 \\ 0.4 & 0.8 \end{bmatrix}$$

$$k := \begin{bmatrix} k1_{1,1} & k1_{1,2} & 0 & 0 & 0 & 0 \\ k1_{2,1} & k1_{2,2} & 0 & 0 & 0 & 0 \\ 0 & 0 & k2_{1,1} & k2_{1,2} & 0 & 0 \\ 0 & 0 & k2_{2,1} & k2_{2,2} & 0 & 0 \\ 0 & 0 & 0 & 0 & k3_{1,1} & k3_{1,2} \\ 0 & 0 & 0 & 0 & k3_{2,1} & k3_{2,2} \end{bmatrix} = \begin{bmatrix} 0.667 & 0.333 & 0 & 0 & 0 & 0 \\ 0.333 & 0.667 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0.949 & 0.474 & 0 & 0 \\ 0 & 0 & 0.474 & 0.949 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0.8 & 0.4 \\ 0 & 0 & 0 & 0 & 0.4 & 0.8 \end{bmatrix}$$

$$K := A^T \cdot k \cdot A = \begin{bmatrix} 1.615 & 0.474 & 0.167 \\ 0.474 & 1.749 & 0.12 \\ 0.167 & 0.12 & 0.08 \end{bmatrix}$$