1 Método dos elementos finitos: Treliça Plana

1.1 Componentes do sistema

Número de barras da estrutura: 4
Número de nós da estrutura: 4

1.1.1 Comprimento das barras

Barra 1: 9.0 cm
Barra 2: 15.0 cm
Barra 3: 9.0 cm
Barra 4: 12.0 cm

1.1.2 Módulo de elasticidade das barras (MPa)

E = 30.0 MPa

1.2 Matrizes de rigidez dos elementos

$$k(1) = \begin{bmatrix} 0.0 & 0.0 & -0.0 & -0.0 \\ 0.0 & 163.6 & -0.0 & -163.6 \\ -0.0 & -0.0 & 0.0 & 0.0 \\ -0.0 & -163.6 & 0.0 & 163.6 \end{bmatrix}$$

$$k(2) = \begin{bmatrix} 62.8 & -47.1 & -62.8 & 47.1 \\ -47.1 & 35.3 & 47.1 & -35.3 \\ -62.8 & 47.1 & 62.8 & -47.1 \\ 47.1 & -35.3 & -47.1 & 35.3 \end{bmatrix}$$

$$k(3) = \begin{bmatrix} 0.0 & 0.0 & -0.0 & -0.0 \\ 0.0 & 163.6 & -0.0 & -163.6 \\ -0.0 & -0.0 & 0.0 & 0.0 \\ -0.0 & -163.6 & 0.0 & 163.6 \end{bmatrix}$$

$$k(4) = \begin{bmatrix} 122.7 & 0.0 & -122.7 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \\ -122.7 & 0.0 & 122.7 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 \end{bmatrix}$$

1.3 Matriz de rigidez Global

$$K = \begin{bmatrix} 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 163.6 & 0.0 & -163.6 & 0.0 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 185.5 & -47.1 & -122.7 & 0.0 & -62.8 & 47.1 \\ 0.0 & -163.6 & -47.1 & 198.9 & 0.0 & 0.0 & 47.1 & -35.3 \\ 0.0 & 0.0 & -122.7 & 0.0 & 122.7 & 0.0 & 0.0 & 0.0 \\ 0.0 & 0.0 & 0.0 & 0.0 & 0.0 & 163.6 & 0.0 & -163.6 \\ 0.0 & 0.0 & -62.8 & 47.1 & 0.0 & 0.0 & 62.8 & -47.1 \\ 0.0 & 0.0 & 47.1 & -35.3 & 0.0 & -163.6 & -47.1 & 198.9 \end{bmatrix}$$

2 Hello

$ax^2 + bx + c = 0$