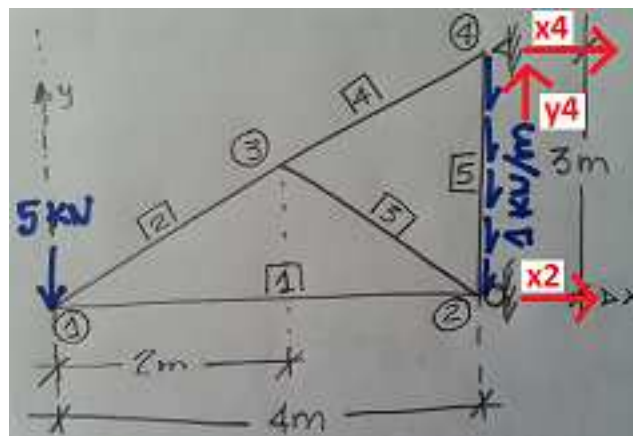


De la cercha plana anterior determine:

1. Reacciones en los apoyos (nudos) 2 y 4.
2. Cargas axiales de todos los elementos (1, 2, 3, 4 y 5).
3. Gráfico de distancia/carga axial del elemento 5.

Reacciones:

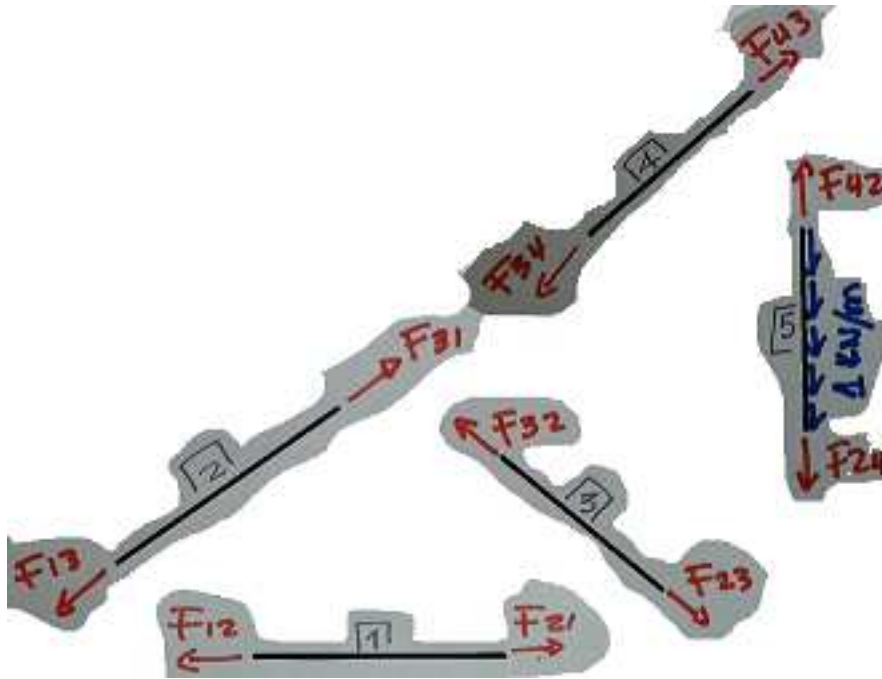


#1: $[x_2 :=, x_4 :=, y_4 :=]$

#2:
$$\begin{bmatrix} x_2 + x_4 = 0 \\ y_4 - 5 - 1 \cdot 3 = 0 \\ 5 \cdot 4 + 1 \cdot 3 \cdot 0 + x_2 \cdot 3 = 0 \end{bmatrix}$$

#3:
$$\left[x_2 := -\frac{20}{3}, x_4 := \frac{20}{3}, y_4 := 8 \right]$$

Cargas axiales de los elementos:



#4: $[F_{12} :=, F_{21} :=, F_{13} :=, F_{31} :=, F_{32} :=, F_{23} :=, F_{34} :=, F_{43} :=, F_{42} :=, F_{24} :=]$

Equilibrio de nudos 2 a 4 con sumatoria de fuerzas internas = sumatoria de fuerzas externas:

#5:
$$\left[\begin{array}{l} F_{21} + F_{23} \cdot \frac{4}{5} = x_2 \qquad - F_{23} \cdot \frac{3}{5} - F_{24} = 0 \\ F_{31} \cdot \frac{4}{5} - F_{32} \cdot \frac{4}{5} - F_{34} \cdot \frac{4}{5} = 0 \quad F_{31} \cdot \frac{3}{5} + F_{32} \cdot \frac{3}{5} - F_{34} \cdot \frac{3}{5} = 0 \\ F_{43} \cdot \frac{4}{5} = x_4 \qquad F_{42} + F_{43} \cdot \frac{3}{5} = y_4 \end{array} \right]$$

Equilibrio de elementos 1 a 4 con sumatoria de fuerzas = 0:

#6:
$$\left[\begin{array}{l} -F_{12} + F_{21} = 0 \\ -F_{13} + F_{31} = 0 \\ -F_{32} + F_{23} = 0 \\ -F_{34} + F_{43} = 0 \end{array} \right]$$

Resuelvo las ecuaciones:

#7:
$$\left[F_{12} = -\frac{20}{3} \wedge F_{43} = \frac{25}{3} \wedge F_{42} = 3 \wedge F_{34} = \frac{25}{3} \wedge F_{32} = 0 \wedge F_{31} = \frac{25}{3} \wedge F_{24} = \right]$$

$$0 \wedge F_{23} = 0 \wedge F_{21} = -\frac{20}{3} \wedge F_{13} = \frac{25}{3} \Bigg]$$

Chequeo de equilibrio del nudo 1:

$$\#8: \left[-F_{13} \cdot \frac{4}{5} - F_{12} = 0, -F_{13} \cdot \frac{3}{5} = -5 \right]$$

$$\#9: \left[-\frac{25}{3} \cdot \frac{4}{5} - -\frac{20}{3} = 0, -\frac{25}{3} \cdot \frac{3}{5} = -5 \right]$$

$$\#10: \quad \quad \quad [true, true]$$

Gráfico de distancia/carga axial del elemento 5:

