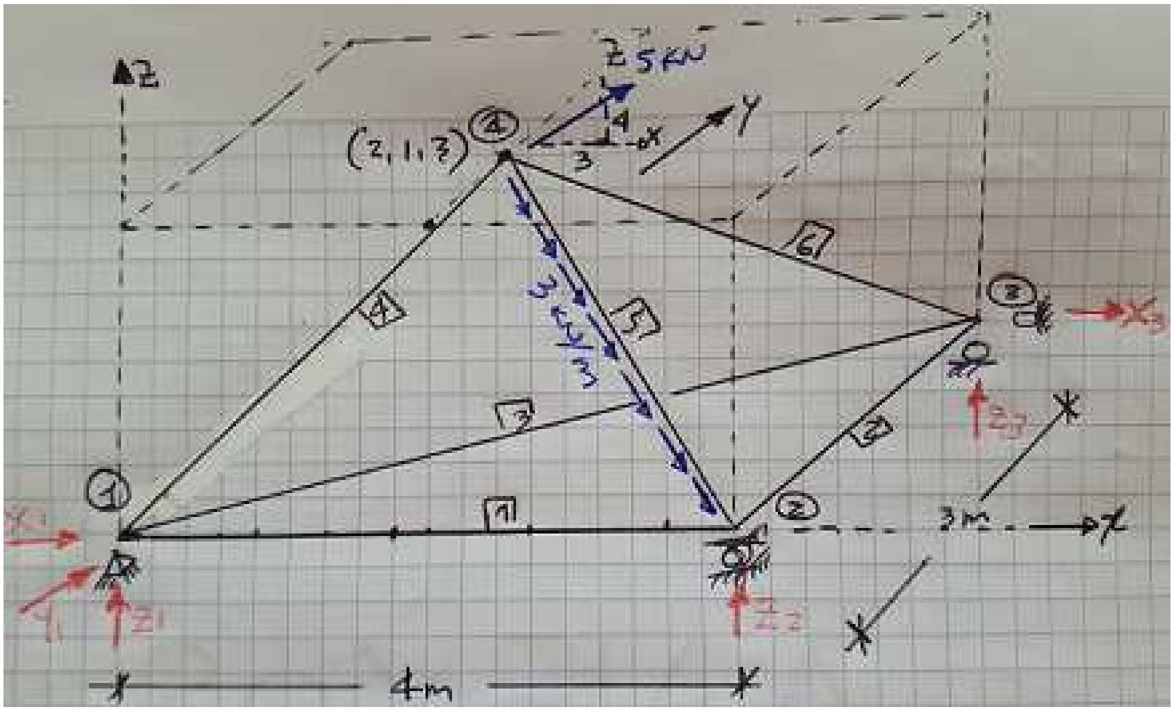

#1: [CaseMode := Sensitive, InputMode := Word]

Longitudes de cada elemento:

#2: $\left[L1 := 4,\ L2 := 3,\ L3 := \sqrt{(4^2 + 3^2)},\ L4 := \sqrt{(2^2 + 1^2 + 3^2)},\ L5 := \sqrt{(2^2 + 1^2 + 3^2)},\ L6 := \sqrt{(2^2 + 2^2 + 3^2)}\right]$

#3: $[L1 := 4,\ L2 := 3,\ L3 := 5,\ L4 := \sqrt{14},\ L5 := \sqrt{14},\ L6 := \sqrt{17}]$

#4: [L1 := 4, L2 := 3, L3 := 5, L4 := 3.741657386, L5 := 3.741657386, L6 := 4.123105625]

Descomposición de la fuerza distribuida de 3KN/m:

#5: $\left[fx := 3\cdot\frac{2}{L5},\ fy := 3\cdot\frac{-1}{L5},\ fz := 3\cdot\frac{-3}{L5}\right]$

#6: $\left[fx := \frac{3\cdot\sqrt{14}}{7},\ fy := -\frac{3\cdot\sqrt{14}}{14},\ fz := -\frac{9\cdot\sqrt{14}}{14}\right]$

#7: [fx := 1.603567451, fy := -0.8017837257, fz := -2.405351177]

Equilibrio estático externo:
∑Fx=0, ∑Fy=0, ∑fz=0
∑M respecto al nudo 4=0

#8: [X1 :=, X3 :=, Y1 :=, Z1 :=, Z2 :=, Z3 :=]

#9:
$$\begin{bmatrix} X1 + X3 + fx\cdot L5 + 5\cdot\frac{3}{5} = 0 \\ Y1 + fy\cdot L5 = 0 \\ Z1 + Z2 + Z3 + fz\cdot L5 + 5\cdot\frac{4}{5} = 0 \\ + Y1\cdot 3 - Z1\cdot 1 - Z2\cdot 1 + Z3\cdot 2 = 0 \\ - X1\cdot 3 - X3\cdot 3 + Z1\cdot 2 - Z2\cdot 2 - Z3\cdot 2 = 0 \\ + X1\cdot 1 - X3\cdot 2 - Y1\cdot 2 = 0 \end{bmatrix}$$

#10:
$$\left[X1 := -4,\ X3 := -5,\ Y1 := 3,\ Z1 := -\frac{17}{4},\ Z2 := \frac{127}{12},\ Z3 := -\frac{4}{3}\right]$$

#11: [X1 = -4 ∧ X3 = -5 ∧ Y1 = 3 ∧ Z1 = -4.25 ∧ Z2 = 10.58333333 ∧ Z3 = -1.333333333]

Cálculo de las fuerzas internas en los nudos:

Procedimiento:
nudo: n ∑Finternas = ∑Fexternas,
elemento: e ∑F=0; ∑M=0

Secuencia:
n1
e1
e3
e4
n2
e5
e2
n3
e6

Chequeo n4

#12: [f12 :=, f21 :=, f23 :=, f32 :=, f13 :=, f31 :=, f14 :=, f41 :=, f24 :=, f42 :=, f34 :=, f43 :=]

Nudo 1:

$$\#13: \left[\begin{array}{c} -f12 - f13\cdot\frac{4}{L3} - f14\cdot\frac{2}{L4} = X1 \\ - f13\cdot\frac{3}{L3} - f14\cdot\frac{1}{L4} = Y1 \\ - f14\cdot\frac{3}{L4} = Z1 \end{array} \right]$$

Elementos 1, 3 y 4:

$$\#14: \left[\begin{array}{c} -f12 + f21 = 0 \\ -f13 + f31 = 0 \\ -f14 + f41 = 0 \end{array} \right]$$

Nudo 2:

$$\#15: \left[\begin{array}{c} f21 + f24\cdot\frac{2}{L5} = 0 \\ -f23 - f24\cdot\frac{1}{L5} = 0 \end{array} \right]$$

Elementos 5 y 2:

$$\#16: \left[\begin{array}{c} f42 - 3\cdot L5 - f24 = 0 \\ -f23 + f32 = 0 \end{array} \right]$$

Nudo 3:

$$\#17: \left[f31\cdot\frac{4}{L3} + f34\cdot\frac{2}{L6} = X3 \right]$$

Elemento 6:

$$\#18: [-f43 + f34 = 0]$$

#19:

$$\begin{bmatrix} f12 := \frac{127}{18} & f13 := -\frac{265}{36} & f14 := \frac{17\cdot\sqrt{14}}{12} \\ f21 := \frac{127}{18} & f23 := \frac{127}{36} & f24 := -\frac{127\cdot\sqrt{14}}{36} \\ f31 := -\frac{265}{36} & f32 := \frac{127}{36} & f34 := \frac{4\cdot\sqrt{17}}{9} \\ f41 := \frac{17\cdot\sqrt{14}}{12} & f42 := -\frac{19\cdot\sqrt{14}}{36} & f43 := \frac{4\cdot\sqrt{17}}{9} \end{bmatrix}$$

#20:

$$\begin{bmatrix} f12 := 7.055555555 & f13 := -7.361111111 & f14 := 5.300681297 \\ f21 := 7.055555555 & f23 := 3.527777777 & f24 := -13.19973578 \\ f31 := -7.361111111 & f32 := 3.527777777 & f34 := 1.832491389 \\ f41 := 5.300681297 & f42 := -1.97476362 & f43 := 1.832491389 \end{bmatrix}$$

Chequeo nudo 4:

#21:

$$\begin{bmatrix} f41\cdot\frac{2}{L4} - f42\cdot\frac{2}{L5} - f43\cdot\frac{2}{L6} = 5\cdot\frac{3}{5} \\ f41\cdot\frac{1}{L4} + f42\cdot\frac{1}{L5} - f43\cdot\frac{2}{L6} = 0 \\ f41\cdot\frac{3}{L4} + f42\cdot\frac{3}{L5} + f43\cdot\frac{3}{L6} = 5\cdot\frac{4}{5} \end{bmatrix}$$

#22:

$$\begin{bmatrix} 3 = 3 \\ 0 = 0 \\ 4 = 4 \end{bmatrix}$$