

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

#2: [X1 :=, Y1 :=, Y4 :=]

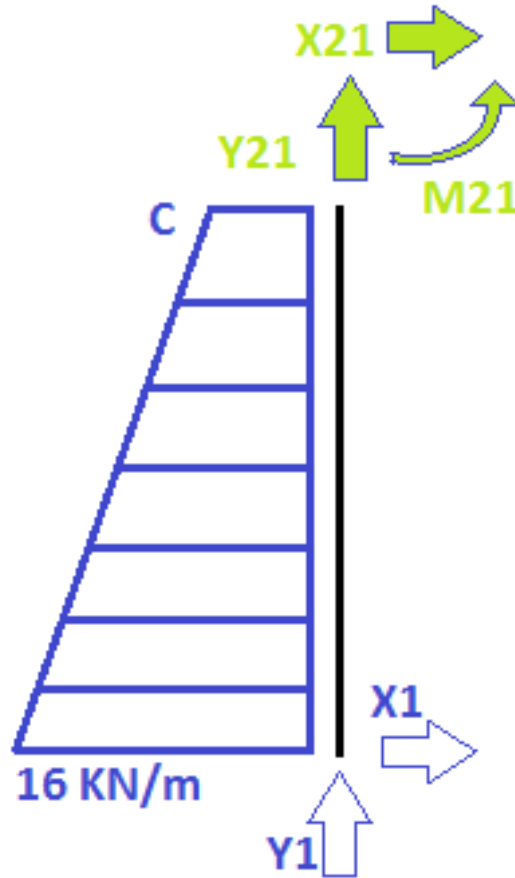
**Equilibrio externo:**

#3: 
$$\begin{bmatrix} X1 + 20 + \frac{16 \cdot 8}{2} = 0 \\ Y1 + Y4 - 10 \cdot 4 = 0 \\ Y4 \cdot 4 - 20 \cdot 5 - 10 \cdot 4 \cdot 2 - \frac{16 \cdot 8}{2} \cdot \frac{1}{3} \cdot 8 = 0 \end{bmatrix}$$

#4: 
$$\left[ X1 := -84, Y1 := -\frac{143}{3}, Y4 := \frac{263}{3} \right]$$

#5: [X1 = -84 ^ Y1 = -47.66666666 ^ Y4 = 87.66666666]

**Diagramas de cuerpo libre por cada elemento:**



#6:  $[x_{21} :=, y_{21} :=, m_{21} :=]$

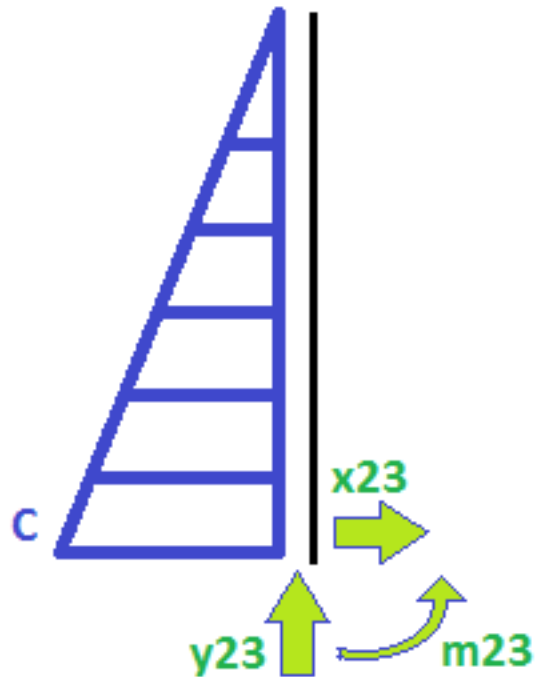
#7:  $\frac{16}{8} = \frac{c}{3}$

#8:  $c = 6$

#9: 
$$\left[ \begin{array}{l} X_1 + x_{21} + \frac{16 + 6}{2} \cdot 5 = 0 \\ Y_1 + y_{21} = 0 \\ -\frac{16 + 6}{2} \cdot 5 \cdot \left( \frac{5}{3} \cdot \frac{16 + 2 \cdot 6}{16 + 6} \right) + m_{21} - x_{21} \cdot 5 = 0 \end{array} \right]$$

#10: 
$$\left[ m_{21} := \frac{785}{3}, y_{21} := \frac{143}{3}, x_{21} := 29 \right]$$

#11:  $[m_{21} = 261.66666666 \wedge x_{21} = 29 \wedge y_{21} = 47.666666666]$



#12:  $[x_{23} :=, y_{23} :=, m_{23} :=]$

#13: 
$$\begin{bmatrix} x_{23} + \frac{6 \cdot 3}{2} = 0 \\ y_{23} = 0 \\ m_{23} - \frac{6 \cdot 3}{2} \cdot \frac{1}{3} \cdot 3 = 0 \end{bmatrix}$$

#14:  $[x_{23} := -9, y_{23} := 0, m_{23} := 9]$

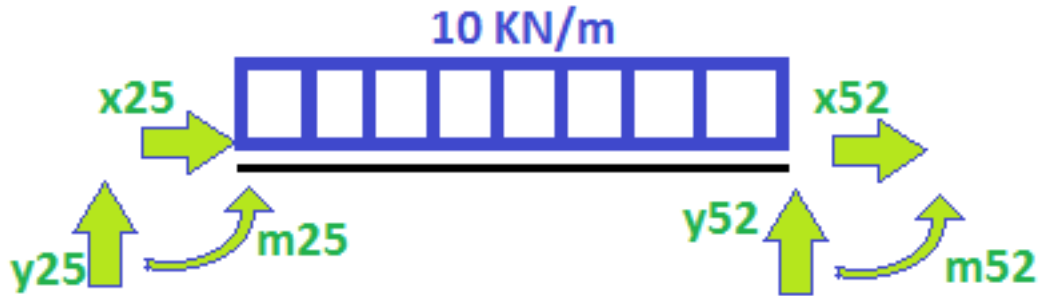
**Nudo 2:**

#15:  $[x_{25} :=, y_{25} :=, m_{25} :=]$

#16: 
$$\begin{bmatrix} x_{25} + x_{21} + x_{23} = 0 \\ y_{25} + y_{21} + y_{23} = 0 \\ m_{25} + m_{21} + m_{23} = 0 \end{bmatrix}$$

#17: 
$$\left[ m_{25} := -\frac{812}{3}, x_{25} := -20, y_{25} := -\frac{143}{3} \right]$$

#18:  $[m_{25} = -270.66666666 \wedge x_{25} = -20 \wedge y_{25} = -47.66666666]$

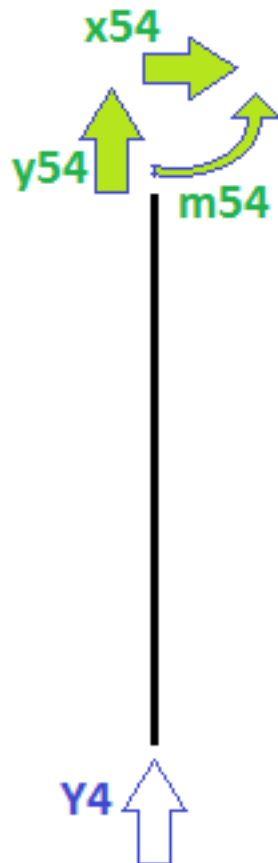


#19:  $[x_{52} :=, y_{52} :=, m_{52} :=]$

#20: 
$$\begin{bmatrix} x_{25} + x_{52} = 0 \\ y_{25} + y_{52} - 10 \cdot 4 = 0 \\ m_{25} + m_{52} + y_{52} \cdot 4 - 10 \cdot 4 \cdot 2 = 0 \end{bmatrix}$$

#21: 
$$\left[ m_{52} := 0, x_{52} := 20, y_{52} := \frac{263}{3} \right]$$

#22:  $[m_{52} = 0 \wedge x_{52} = 20 \wedge y_{52} = 87.66666666]$



#23: [x54 :=, y54 :=, m54 :=]

$$\#24: \begin{bmatrix} x54 = 0 \\ y54 + Y4 = 0 \\ m54 - x54 \cdot 2 = 0 \end{bmatrix}$$

$$\#25: \left[ m54 := 0, x54 := 0, y54 := -\frac{263}{3} \right]$$

$$\#26: [m54 = 0 \wedge x54 = 0 \wedge y54 = -87.66666666]$$

**Chequeo en el nudo 5:**

$$\#27: \begin{bmatrix} x54 + x52 = 20 \\ y54 + y52 = 0 \\ m54 + m52 = 0 \end{bmatrix}$$

$$\#28: \begin{bmatrix} \text{true} \\ \text{true} \\ \text{true} \end{bmatrix}$$