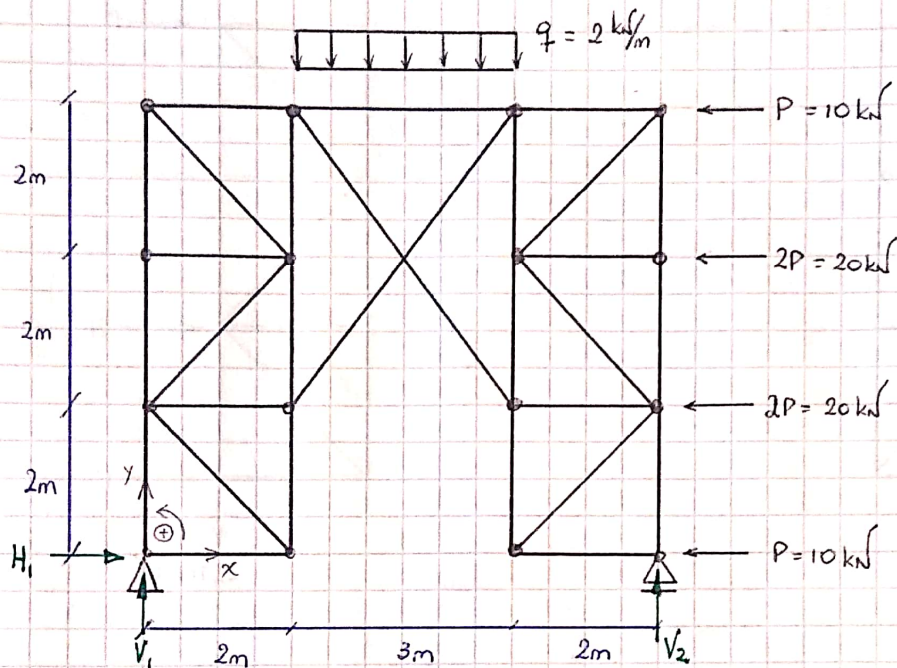


EJERCICIO 2.11 - TP5

$$\textcircled{1} \sum F_x = 0 \Rightarrow H_1 - P - 2P - 2P - P = 0 \Rightarrow H_1 = 60 \text{ kN}$$

$$\textcircled{2} \sum F_y = 0 \Rightarrow V_1 + V_2 - 3q = 0 \Rightarrow V_1 + V_2 = 6$$

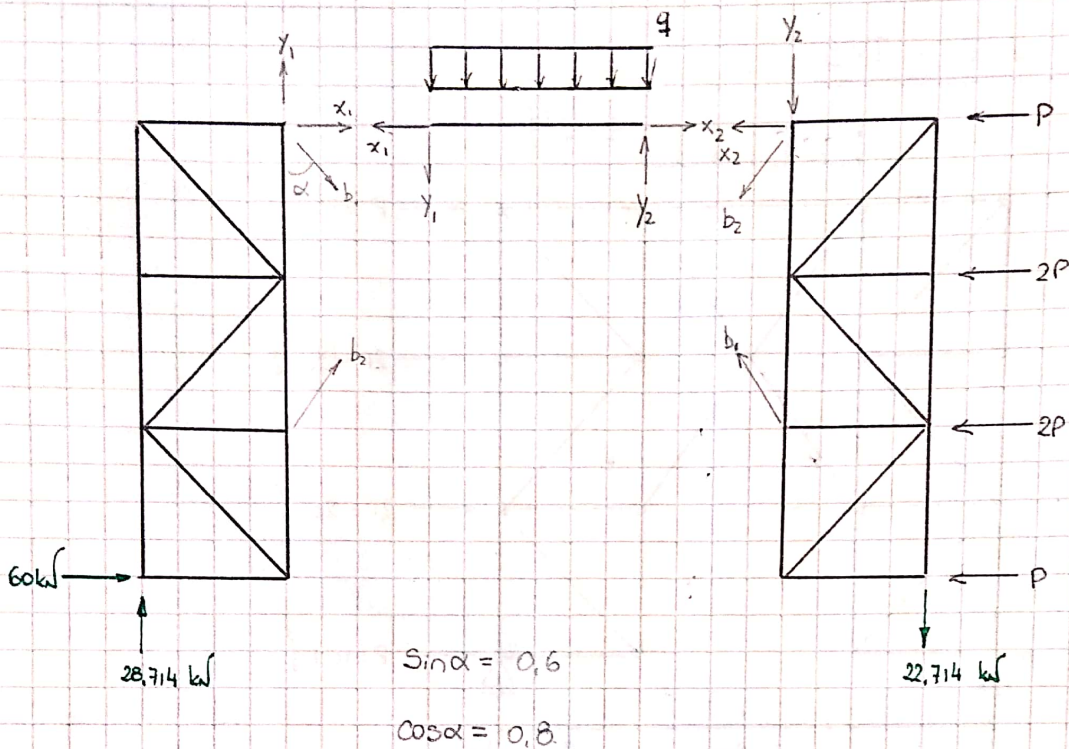
$$\textcircled{3} \sum M = 0 \Rightarrow -3q \cdot 3.5 + 7V_2 + 2P \cdot 2 + 2P \cdot 4 + P \cdot 6 = 0 \Rightarrow 7V_2 = -159$$

De $\textcircled{1}$: $H_1 = 60 \text{ kN}$

De $\textcircled{3}$: $V_2 = -22.714 \text{ kN}$

Reemplazando en $\textcircled{2}$: $V_1 = 28.714 \text{ kN}$

Despiece.



$$\begin{aligned} \textcircled{1} & \quad x_1 + b_1 \sin \alpha + b_2 \sin \alpha = -60 \\ \textcircled{2} & \quad y_1 - b_1 \cos \alpha + b_2 \cos \alpha = -28,714 \quad \Rightarrow \text{(Con } \textcircled{5}) \quad -0,8b_1 + 0,8b_2 = -25,714 \\ \textcircled{3} & \quad -6x_1 + 2y_1 + (-\sin \alpha \cdot 6 - 2\cos \alpha)b_1 + (-2\sin \alpha + 2\cos \alpha)b_2 = 0 \end{aligned}$$

$$\begin{aligned} \textcircled{4} & \quad x_1 = x_2 \\ \textcircled{5} & \quad y_2 - y_1 - 3q = 0 \quad \Rightarrow \text{(Con } \textcircled{6}) \quad \underline{y_1 = -3 \text{ kN}} \\ \textcircled{6} & \quad 3y_2 - 1,5 \cdot 3q = 0 \quad \Rightarrow \quad \underline{y_2 = 3 \text{ kN}} \end{aligned}$$

$$\begin{aligned} \textcircled{7} & \quad -x_2 - b_2 \sin \alpha - b_1 \sin \alpha - 6P = 0 \\ \textcircled{8} & \quad -y_2 - b_2 \cos \alpha + b_1 \cos \alpha - 22,714 = 0 \quad \Rightarrow \text{(Con } \textcircled{6}) \quad 0,8b_1 - 0,8b_2 = 25,714 \\ \textcircled{9} & \quad 6x_2 + 2y_2 + 6P + 4 \cdot 2P + 2 \cdot 2P + (6\sin \alpha + 2\cos \alpha)b_2 + (2\sin \alpha - 2\cos \alpha)b_1 = 0 \end{aligned}$$

$$\begin{aligned} \text{Con } \textcircled{3} \text{ y } \textcircled{5} : & \quad -5,2b_1 + 0,4b_2 - 6x_1 = 6 \\ \text{Con } \textcircled{4}, \textcircled{6} \text{ y } \textcircled{9} : & \quad -0,4b_1 + 5,2b_2 + 6x_1 = -186 \\ \text{Con } \textcircled{1} : & \quad 0,6b_1 + 0,6b_2 + x_1 = -60 \end{aligned} \quad \Rightarrow \quad \begin{cases} \underline{b_1 = -93,929 \text{ kN}} \\ \underline{b_2 = -126,071 \text{ kN}} \\ \underline{x_1 = 72 \text{ kN} = x_2} \end{cases}$$

Esfuerzos internos (nodos)

