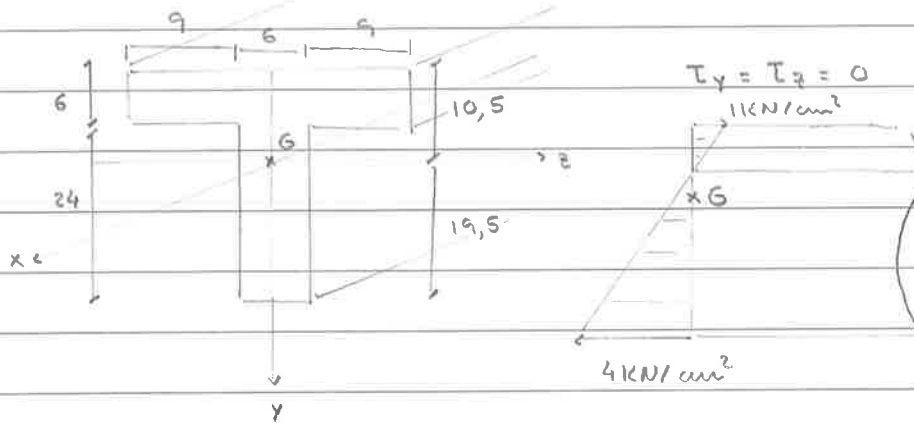


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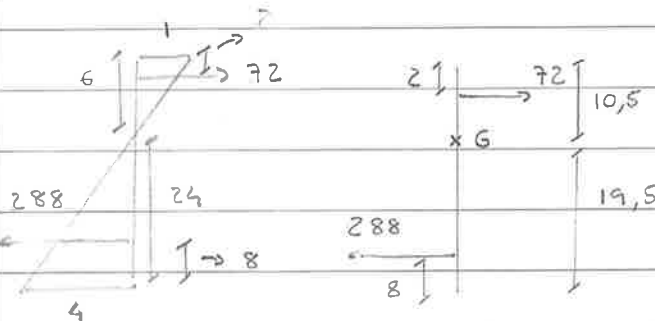
Exercício: Calcular as esferas solitárias (N, V_y, V_z, T, M_y, M_z)



$$N = -\left(\frac{6 \cdot 1}{2}\right) \cdot 24 + \left(\frac{4 \cdot 24}{2}\right) \cdot 6 = \underline{\underline{216 \text{ kN}}}$$

$$\tau_y = 0 \Rightarrow V_y = \underline{\underline{0 \text{ kN}}} \quad T = 0 \text{ kN} (\tau_y = \tau_z = 0)$$

$$\tau_z = 0 \Rightarrow V_z = \underline{\underline{0 \text{ kN}}} \quad M_y = 0 \text{ kNm (Por Simetria)}$$



$$I_z = 288 \cdot (19,5 - 8) + 72 \cdot (10,5 - 2)$$

$$I_z = \underline{\underline{3924 \text{ kNm}}}$$