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Licenciatura: Arquitectura

Cuatrimestre: 3

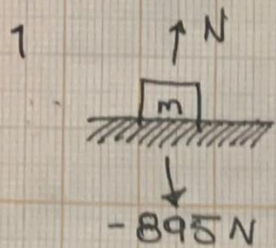
Materia: Estática para la arquitectura

Profesor: García López Pedro Alberto

Actividad: Estática

Fecha: 21/05/2023

① Encontrar la masa y comprobar equilibrio:



$$m = N/g$$

$$m = 895 \text{ N} / 9.81 \text{ m/s}^2$$

$$N = m \cdot g$$

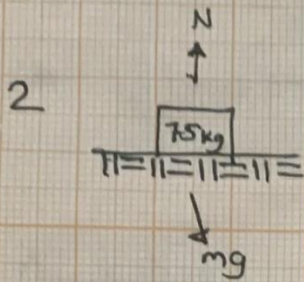
$$m = \underline{91.32 \text{ kg}}$$

$$N = 91.32 \text{ kg} \cdot 9.81 \text{ m/s}^2$$

$$N = 895 \text{ N}$$

$$\sum F_r = 0$$

$$895 \text{ N} - 895 \text{ N} = 0$$



$$m \cdot g = 75 \text{ kg} \cdot 9.81 \text{ m/s}^2$$

$$m \cdot g = 735.75 \text{ N}$$

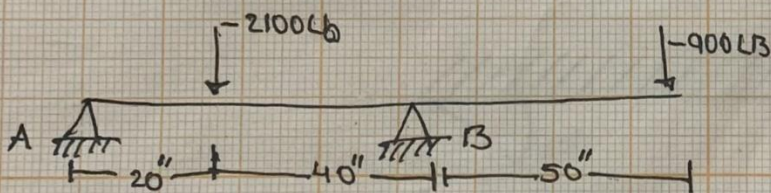
$$m = \underline{75 \text{ kg}}$$

$$N = m \cdot g$$

$$N = 735.75$$

$$\sum F_r = 735.75 - 735.75 = 0$$

② Un tractor de 2100 Lb se utiliza para levantar 900 Lb de grava. Determina la reacción de cada una de las llantas



$$M_A = [-2100 \text{ Lb} (20'')] + [-900 \text{ Lb} (110'')] + R_B 60'' = 0$$

$$-42000 \text{ Lb}'' - 99000 \text{ Lb}'' + R_B 60'' = 0$$

$$-141000 \text{ Lb}'' + R_B 60'' = 0$$

$$R_B 60'' = 141000 \text{ Lb}''$$

$$R_B = \frac{141000 \text{ Lb}''}{60''}$$

$$R_B = \underline{2350 \text{ Lb}}$$

$$\sum Y = 0$$

$$-R_A + 2100 \text{ Lb} - 900 \text{ Lb} + 2350 \text{ Lb} = 0$$

$$-R_A = -3000 \text{ Lb} + 2350 \text{ Lb}$$

$$-R_A = -650 \text{ Lb}$$

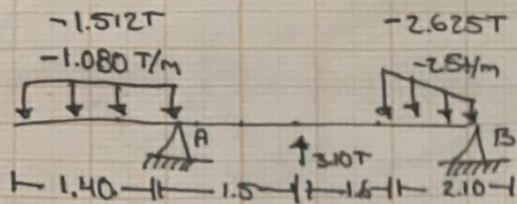
$$R_A = \underline{650 \text{ Lb}}$$

Comprobación

$$\sum Y = 650 \text{ Lb} - 2100 \text{ Lb} - 900 \text{ Lb} + 2350 \text{ Lb}$$

$$\sum Y = 0$$

3



$$P_1 = W \cdot L \quad P = 1.080 \text{ T/m} \cdot 1.40 \text{ m}$$

$$P = -1.512 \text{ T}$$

$$P_2 = \left(\frac{W \cdot L}{2} \right) \quad P = \frac{-2.5 \text{ T/m} \cdot 2.10}{2}$$

$$P = -2.625 \text{ T}$$

$$U_{P_1} = \frac{1.40}{2} = 0.70 \text{ m} \quad U_{P_2} = \frac{2.10}{3} = 0.7 \text{ m}$$

$$M_A = [1.512(0.70)] + [3.10(1.5)] + [-2.625(3.8)]$$

$$+ R_B 5.2 \text{ m} = 0$$

$$M_A = 1.058 \text{ Tm} + 4.65 \text{ Tm} - 9.975 + R_B 5.2 = 0$$

$$M_A = R_B = \frac{4.267 \text{ Tm}}{5.2 \text{ m}}$$

$$R_B = 0.82 \text{ T}$$

$$\Sigma Y = 0$$

$$-1.080 \text{ T} + R_A + 3.10 \text{ T} - 2.625 \text{ T} + 0.82 \text{ T} = 0$$

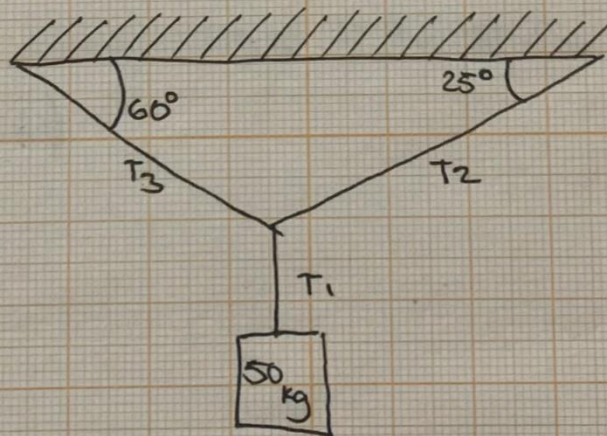
$$R_A = 0.217 \text{ T}$$

Comprobación $\Sigma Y = 0$

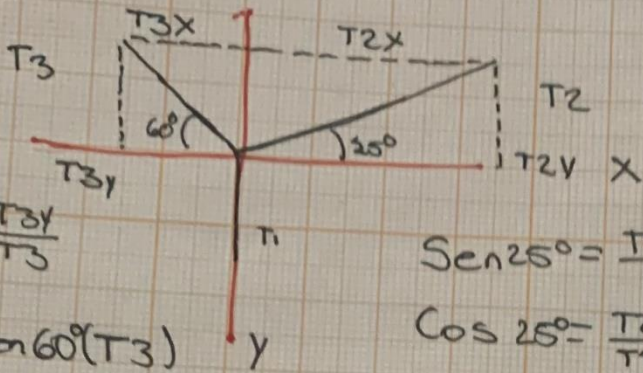
$$\Sigma Y = -1.512 \text{ T} + 0.217 \text{ T} + 3.1 \text{ T} - 2.625 \text{ T} + 0.82 \text{ T} = 0$$

$$\Sigma Y = 0$$

4) Un Saco de cemento de 50 kg de masa cuelga en equilibrio de 3 cuerdas. Dos de las cuerdas forman angulos de 60° y 25° con la horizontal. Hallar la tension de las cuerdas.



DCL



$$\text{Sen } 60^\circ = \frac{T_{3y}}{T_3}$$

$$T_{3y} = \text{Sen } 60^\circ (T_3)$$

$$\text{Cos } 60^\circ = \frac{T_{3x}}{T_3}$$

$$T_{3x} = \text{Cos } 60^\circ (T_3)$$

$$\text{Sen } 25^\circ = \frac{T_{2y}}{T_2}$$

$$\text{Cos } 25^\circ = \frac{T_{2x}}{T_2}$$

$$T_{2y} = \text{Sen } 25^\circ (T_2)$$

$$T_{2x} = \text{Cos } 25^\circ (T_2)$$

$$T_2 = \frac{\text{Cos } 60^\circ}{\text{Cos } 25^\circ} (T_3)$$

$$\sum F_x = -\text{Cos } 60^\circ (T_3) + \text{Cos } 25^\circ (T_2) = 0$$

$$\text{Cos } 25^\circ (T_2) = \text{Cos } 60^\circ (T_3)$$

$$T_2 = \frac{\text{Cos } 60^\circ}{\text{Cos } 25^\circ} (T_3)$$

$$T_2 = 0.551 (T_3)$$

$$\sum F_y = 0$$

$$\text{Sen } 25^\circ (T_2) + \text{Sen } 60^\circ (T_3) - 490.5 \text{ N} = 0$$

$$0.422 (0.551 (T_3)) + 0.866 (T_3) = 490.5 \text{ N}$$

$$0.232 (T_3) + 0.866 (T_3) = 490.5 \text{ N}$$

$$1.098 (T_3) = 490.5 \text{ N}$$

$$T_3 = \frac{490.5 \text{ N}}{1.098}$$

$$T_3 = \underline{446 \text{ N}}$$

$$T_2 = 0.551 (446 \text{ N})$$

$$T_2 = \underline{245 \text{ N}}$$