



**Mi Universidad**

**Ejercicios**

*Alejandra Monserrath Aguilar Gómez*

*Momentos*

*Parcial I*

*Estática para la arquitectura*

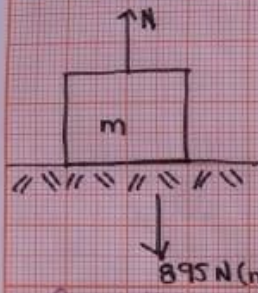
*Pedro Alberto García López*

*Arquitectura*

*3er Cuatrimestre*

*Comitán de Domínguez, 20/05/23*

1. Encontrar la masa y comprobar equilibrio

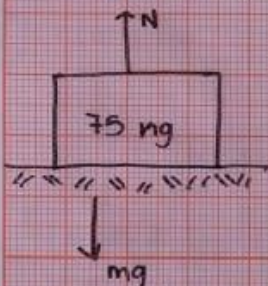


$$N \rightarrow 895 \text{ N} / 9.81 \text{ m/s}^2 = 91.23 \text{ kg}$$

$$mg \rightarrow 895 \text{ N} / 9.81 \text{ m/s}^2 = 91.23 \text{ kg}$$

$$\sum F_x = 0 \rightarrow 91.23 - 91.23 = 0$$

2. Comprobar equilibrio

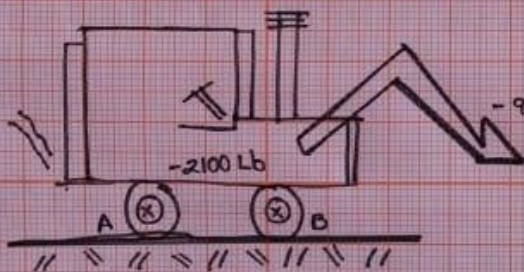


$$N = 75 \text{ kg} (9.81 \text{ m/s}^2) = 735.75$$

$$mg = 75 \text{ kg} (9.81 \text{ m/s}^2) = 735.75$$

$$\sum F_x = 0 \rightarrow \sum F_x = 735.75 - 735.75 = 0$$

3. Un tractor de 2100 libras se utiliza para levantar 900 libras de grava determina cada una de sus ejes de las llantas.



$$\sum M = 0$$

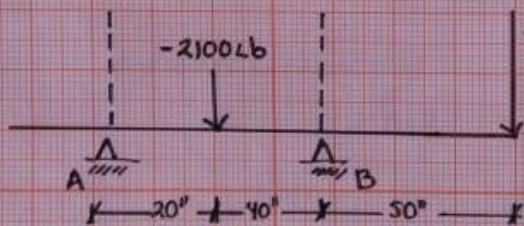
$$\sum M_A = [(2100 \text{ lb})(20'')] + [(-900 \text{ lb})(110'')] + [(R_B)(60'')] = 0$$

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

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

$$R_B = \frac{141000 \text{ lb}''}{60} = 2350 \text{ lb}$$

$$\sum F_y = 0$$



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

$$R_A - 3000 \text{ lb} + 2350 \text{ lb} = 0$$

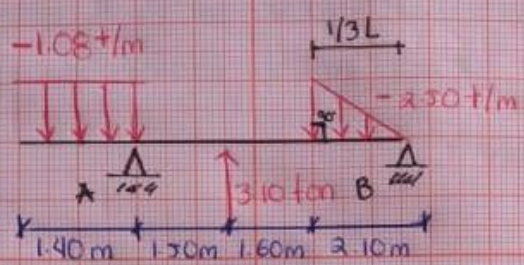
$$R_A = 650 \text{ lb}$$

Comprobación

$$650 \text{ lb} - 2100 \text{ lb} - 900 \text{ lb} + 2350 \text{ lb} = 0$$

$$0 = 0$$

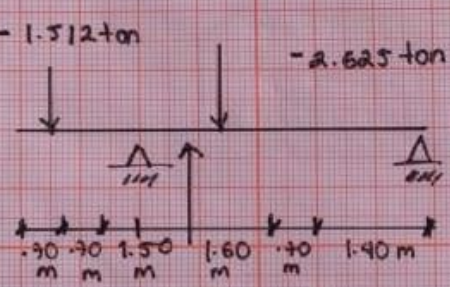
4.



①  $P = w \cdot L$   
 $P = (-1.08 \text{ t/m})(1.40 \text{ m}) = -1.512 \text{ t}$   
 $U_P = U_P$   
 $U_P = 1.40/2 = 0.70 \text{ m}$

$P = w \cdot L/2$   
 $P = (-250 \text{ t/m})(2.10 \text{ m}) = -2.625 \text{ t}$   
 $U_P = 2/3$   
 $U_P = 2/3(2.10) = 1.40 \text{ m}$   
 $1/3 L = 1/3(2.10) = 0.70 \text{ m}$

②



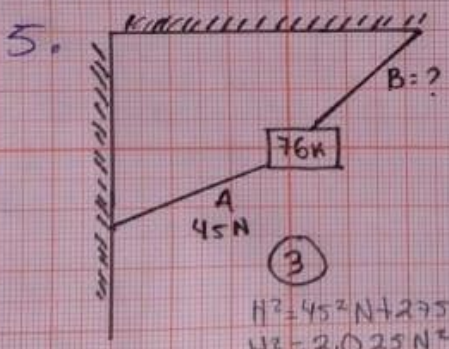
③  $\sum M_B = 0$   
 $(-1.512 \text{ ton} \cdot 0.70 \text{ m}) + (3.10 \text{ ton} \cdot 1.50 \text{ m}) + (-2.625 \text{ ton} \cdot 3.80 \text{ m}) + R_A \cdot 3.20 = 0$   
 $-1.0584 \text{ ton} \cdot \text{m} + 4.65 \text{ ton} \cdot \text{m} - 9.975 \text{ ton} \cdot \text{m} + R_A \cdot 3.20 \text{ m} = 0$   
 $-4.2834 \text{ ton} \cdot \text{m} + (R_A \cdot 3.20 \text{ m}) = 0$   
 $R_A = \frac{4.2834 \text{ ton} \cdot \text{m}}{3.20 \text{ m}} = 1.34 \text{ ton}$

④

$\sum F_y = 0$   
 $-1.512 \text{ ton} + R_A + 3.10 \text{ ton} - 2.625 \text{ ton} + R_B = 0$   
 $R_A = -0.217 = 0$   
 $R_A = 0.217 \text{ ton}$

⑤ Comprobación.

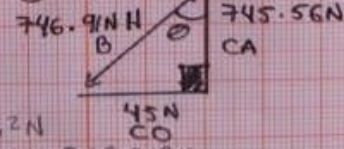
$-1.512 \text{ ton} + 0.217 \text{ ton} + 3.10 \text{ ton} - 2.625 \text{ ton} + 0.32 \text{ ton} = 0$   
 $0 = 0$



① Unidades.

$76 \text{ kg} (9.81 \text{ m/s}^2) = 745.56 \text{ N}$

② D.C.L.



③

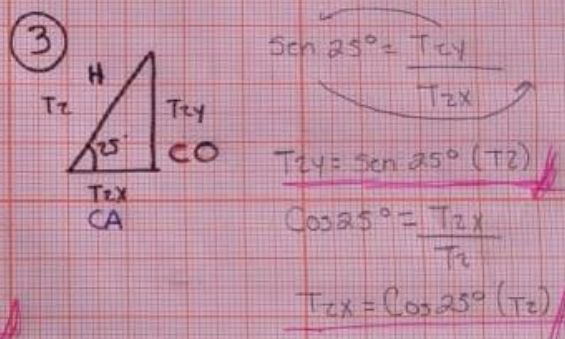
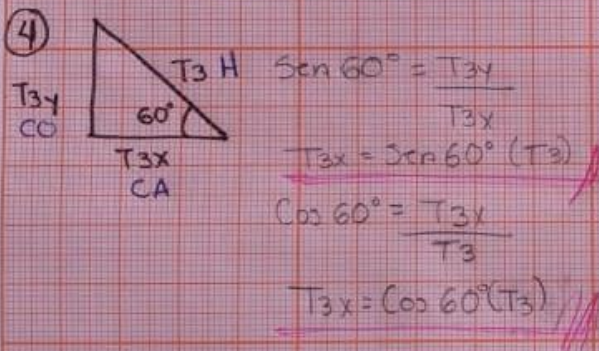
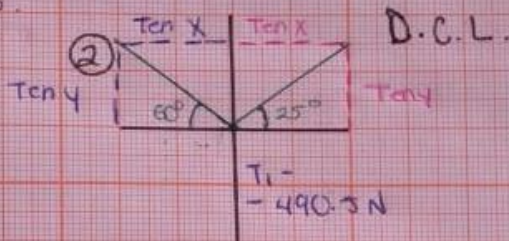
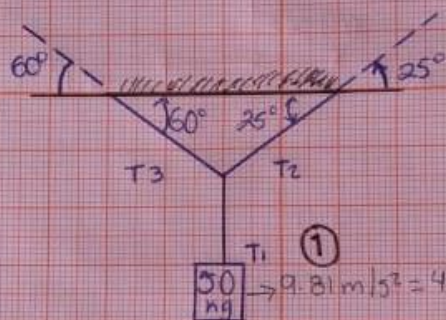
$H^2 = 45^2 \text{ N} + 745.56^2 \text{ N}$   
 $H^2 = 2.025 \text{ N} + 555.859.7136$   
 $H = \sqrt{557.884.7136 \text{ N}^2}$   
 $H = 746.91 \text{ N}$

Rayter

④  $\sin \phi = CO/CA$

$\sin \phi = \frac{45 \text{ N}}{746.91 \text{ N}}$   
 $\sin \theta = 0.060$   
 $\theta = 0.060 (\sin^{-1})$   
 $\theta = 3.43$   
 $= 39.26^\circ \text{ a } 23.30^\circ$

6. Un saco de Cemento de 50 kg de masa cuelga en equilibrio de 3 cuerdas a de las cuerdas forman ángulos de  $60^\circ$  y  $25^\circ$  con la horizontal. Ayar la tensión de las cuerdas.



5.  $\sum F_y = 0$   
 $T_{2y} + T_{3y} = 0$   
 $\text{Cos } 25^\circ (T_2) - \text{Cos } 60^\circ (T_3) = 0$   
 $\text{Cos } 25^\circ (T_2) = \text{Cos } 60^\circ (T_3)$   
 $T_2 = \frac{\text{Cos } 60^\circ (T_3)}{\text{Cos } 25^\circ} = 0.551 (T_3)$

7.  $T_2$   
 $T_2 = 0.551 (446.5 \text{ N})$   
 $T_2 = 245.919 \text{ N}$

6.  $\sum F_x = 0$   
 $T_{2y} + T_{3y} - T_1 = 0$   
 $\text{Sen } 25^\circ (T_2) + \text{Sen } 60^\circ (T_3) - 490.5 \text{ N} = 0$   
 $\text{Sen } 25^\circ (0.551 \cdot T_3) + \text{Sen } 60^\circ (T_3) = 490.5 \text{ N}$   
 $0.233 \cdot T_3 + 0.866 \cdot T_3 = 490.5 \text{ N}$   
 $1.099 \cdot T_3 = 490.5 \text{ N}$   
 $T_3 = \frac{490 \text{ N}}{1.099} = 446.315 \text{ N}$

Rayter