



# Mi Universidad

## ejercicios

*Nombre del Alumno: Gael Federico López Ochoa*

*Nombre del tema: estática*

*Parcial: I*

*Nombre de la Materiaestatica para la arquitectura*

*Nombre del profesor: pedro Alberto García*

*Nombre de la Licenciatura: arquitectura*

*Cuatrimestre: 3*

Calcula el peso de un balón lanzado en la tierra con una masa de 0.6 Kg

Valores

$$m: 0.6 \text{ Kg}$$

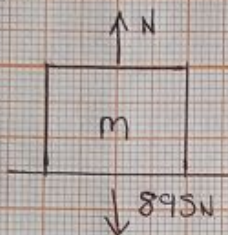
$$g: 9.8 \text{ m/s}^2$$

$$W = g \cdot m$$

$$W: 9.8 \text{ m/s}^2 \cdot 0.6 \text{ Kg}$$

$$W: 5.886 \text{ N}$$

①

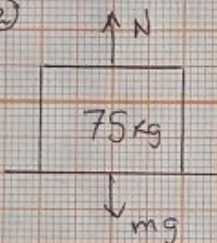


$$895 \text{ N} / 9.81 = 91.23 \text{ Kg}$$

$$\sum F_r = 0$$

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

②

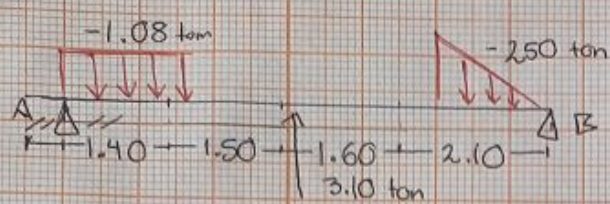


$$N = 735 \quad \sum F_r = 0$$

$$mg = 75 \text{ Kg}$$

$$75 \text{ Kg} \cdot 9.81 \text{ m/s}^2 = 735 \text{ N}$$

$$735 \text{ N} - 735 \text{ N} = 0$$



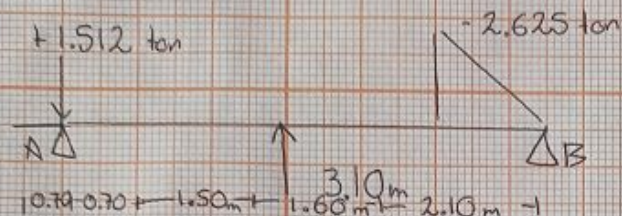
$$P: W \cdot L \quad P: -1.08 \text{ ton} \cdot \text{m} = 1.40 \text{m}$$

$$P: -1.512 \text{ ton} \quad \text{up: } 1.40 \text{m} / 2 = 0.7 \text{m}$$

$$P: (W \cdot L) / 2 = -2.50 \text{ ton} \cdot 2.10 \text{m}$$

$$P: -5.25 \text{ ton} \cdot \text{m} / 2 \text{m} = -2.625 \text{ ton}$$

$$\text{up: } 2.10 / 3 = 0.7 \text{m}$$



$$\sum M = 0$$

$$M_A = [-1.512 \text{ ton} \cdot (0.70 \text{m})] + [3.10 \text{ ton} \cdot (1.50 \text{m})] + [-2.625 \text{ ton} \cdot (3.8 \text{m})] + [R_B \cdot 5.2 \text{m}]$$

$$+ 1.0584 \text{ ton} \cdot \text{m} + 4.65 \text{ ton} \cdot \text{m} - 9.975 \text{ ton} \cdot \text{m} + R_B \cdot 5.2 \text{m}$$

$$- 9.975 + 5.7084 : 4.267 \text{ ton} \cdot \text{m} / 5.2 \text{m} = 0.82 \text{ ton}$$

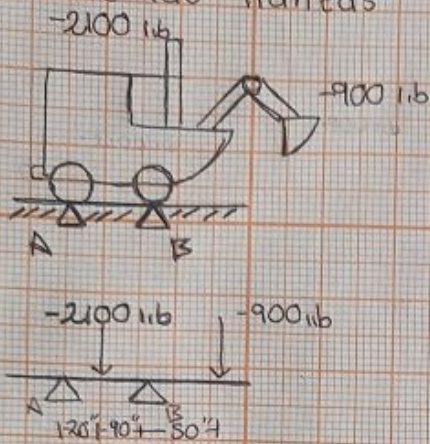
$$R_A = -1.512 \text{ ton} - 2.625 \text{ ton} + 3.10 \text{ ton} + 0.82 \text{ ton}$$

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

Comprobacion

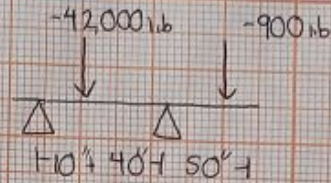
$$-1.512 \text{ ton} + 3.10 \text{ ton} - 2.625 \text{ ton} + 0.82 \text{ ton} + 0.217 \text{ ton} = 0$$

Un tractor de 2100 libras, se utiliza para levantar 900 libras de gravo. Determina la reaccion de cada una de sus ejes de las llantas



$$P = W \cdot L \quad P: -2100 \text{ lb} \cdot 20 = -42,000 \text{ lb} \cdot \text{pul}$$

$$\text{up: } L/2 \quad \text{up: } 20\text{m}/2 = 10 \text{ m}$$



$$\sum M = 0$$

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

$$: (-42,000 \text{ lb} \cdot \text{pul}) + (-99,000 \text{ lb} \cdot \text{pul}) + R_B \cdot 60 \text{ pulg} = 0$$

$$-141,000 \text{ lb} \cdot \text{pulg} + R_B \cdot 60 \text{ pulg} = 0$$

$$R_B: 141,000 / 60 \text{ lb} \cdot \text{pulg} = 2350 \text{ lb}$$

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

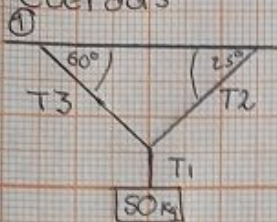
$$R_A = -3000 \text{ lb} + 2350 \text{ lb} = 0$$

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

Comprobacion

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

Un saco de cemento de 50 kg de masa cuelga en equilibrio de 3 cuerdas 2 de las cuerdas forman ángulos de 60 y 25 grados con la horizontal. Hallar la tensión de las cuerdas

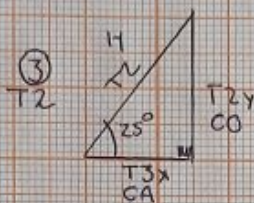
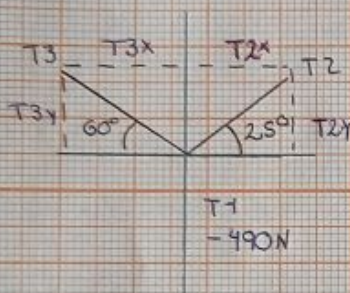


$$50 \text{ kg} \cdot 9.81 \text{ m/s}^2 = -490.5 \text{ N}$$

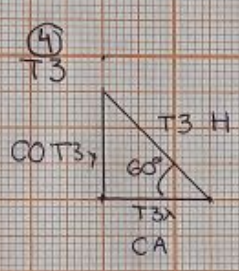
$$T_1 + T_2 = 0$$

$$T_1 + T_2 + T_3 = 0$$

② D.C.L



$$\begin{aligned} \text{Sen } 25^\circ &= T_{2y} / T_2 \\ T_{2y} &= \text{Sen } 25^\circ (T_2) \\ \text{Cos } 25^\circ &= T_{2x} / T_2 \\ T_{2x} &= \text{Cos } 25^\circ (T_2) \end{aligned}$$



$$\begin{aligned} \text{Sen } 60^\circ &= T_{3y} / T_3 \\ T_{3y} &= \text{Sen } 60^\circ (T_3) \\ \text{Cos } 60^\circ &= T_{3x} / T_3 \\ T_{3x} &= \text{Cos } 60^\circ (T_3) \end{aligned}$$

⑤  $\sum F_x = 0$

$$\begin{aligned} T_{2x} + T_{3x} &= 0 \\ \text{Cos } 25^\circ (T_2) - \text{Cos } 60^\circ (T_3) &= 0 \\ \text{Cos } 25^\circ (T_2) &= \text{Cos } 60^\circ (T_3) \\ T_2 &= \frac{\text{Cos } 60^\circ (T_3)}{\text{Cos } 25^\circ} = 0.551 (T_3) \end{aligned}$$

⑥  $\sum F_y = 0$

$$\begin{aligned} T_{2y} + T_{3y} - T_1 &= 0 \\ \text{Sen } 25^\circ (T_2) + \text{Sen } 60^\circ (T_3) - 490.5 \text{ N} &= 0 \\ \text{Sen } 25^\circ (0.551 \cdot T_3) + \text{Sen } 60^\circ (T_3) &= 490.5 \text{ N} \\ 0.233 \cdot T_3 + 0.866 \cdot T_3 &= 490.5 \text{ N} \\ 1.099 \cdot T_3 &= 490.5 \text{ N} \end{aligned}$$

⑦

$$\begin{aligned} T_2 &= 0.551 \cdot (446.315 \text{ N}) = 245.919 \text{ N} \\ T_1 &= 490.5 \text{ N} \\ T_2 &= 245.919 \text{ N} \\ T_3 &= 446.315 \text{ N} \end{aligned}$$