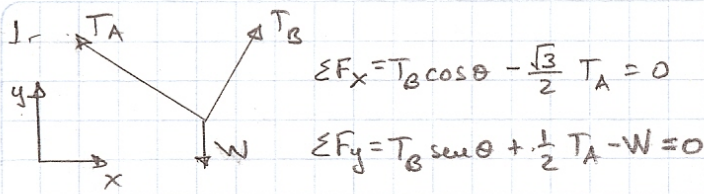


ESTÁTICA



$$\begin{aligned} \sum F_x &= T_B \cos \theta - \frac{\sqrt{3}}{2} T_A = 0 \\ \sum F_y &= T_B \sin \theta + \frac{1}{2} T_A - W = 0 \end{aligned}$$

como  $T_B = 2T_A$

$$\begin{cases} 2T_A \cos \theta - \frac{\sqrt{3}}{2} T_A = 0 \\ 2T_A \sin \theta + \frac{1}{2} T_A = W \end{cases}$$

resolviendo el sistema  $\theta = 64.34^\circ$

$T_A = 42.6 \text{ N}$  y  $T_B = 85.2 \text{ N}$

2.-  $\vec{F}_1 = -20\hat{i}$ ;  $\vec{F}_2 = -10\hat{j}$   
 $\vec{R} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 \Rightarrow \vec{F}_3 = \vec{R} - \vec{F}_1 - \vec{F}_2$

Del sistema B  $\vec{r}_A = 10\hat{i} - 5\hat{j}$   
 $\vec{R} = R(-\frac{3}{5}\hat{i} - \frac{4}{5}\hat{j})$

$\vec{M}_0 = \vec{r}_A \times \vec{R} = -11R\hat{k} = -220\hat{k}$

$\Rightarrow R = 20 \Rightarrow \vec{R} = -12\hat{i} - 16\hat{j} \text{ N}$

$\Rightarrow \vec{F}_3 = 8\hat{i} - 6\hat{j} \text{ N}$

3.- a)  $\vec{R} = -20\hat{i} - 20\hat{j} - 10\hat{k} \text{ N}$

Momentos con respecto al origen

$\vec{M}_1 = (\hat{i} + \hat{k}) \times (-20\hat{j}) = 20\hat{i} - 20\hat{k} \text{ N}\cdot\text{m}$

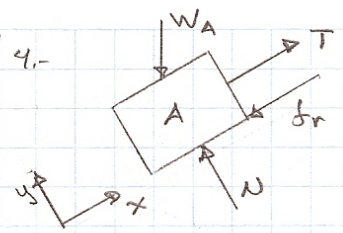
$\vec{M}_2 = (\hat{j} + \hat{k}) \times (-20\hat{i}) = -20\hat{j} + 20\hat{k} \text{ N}\cdot\text{m}$

$\vec{M}_3 = (\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j} + \frac{1}{2}\hat{k}) \times (-10\hat{k}) = -5\hat{i} + 5\hat{j} \text{ N}\cdot\text{m}$

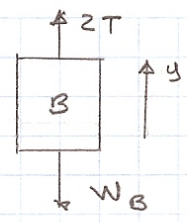
$\vec{M}_0 = \sum \vec{M}_i = 15\hat{i} - 15\hat{j} \text{ N}\cdot\text{m}$

b) Como  $\vec{R} \cdot \vec{M}_0 = 0$ ,

el sistema se puede reducir a una sola fuerza.



Bloque A



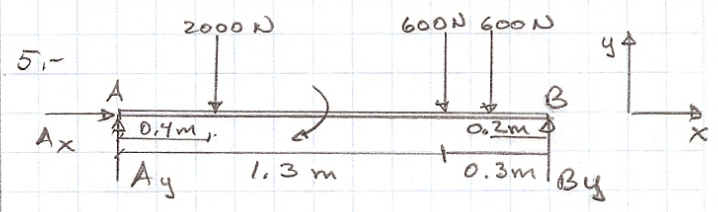
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$$\begin{aligned} \sum F_x &= T - fr - \frac{1}{2}W_A = 0 \\ \sum F_y &= N - \frac{\sqrt{3}}{2}W_A = 0 \end{aligned} \quad \left. \begin{aligned} \sum F_y &= 2T - W_B = 0 \\ \Rightarrow T &= \frac{W_B}{2} \end{aligned} \right\}$$

sust. en  $\sum F_x \Rightarrow \frac{W_B}{2} - \frac{\sqrt{3}}{2}\mu_s W_A - \frac{1}{2}W_A = 0$

$\Rightarrow W_B = 2W_A$

$\Rightarrow W_B = 196.2 \text{ N}$  ;  $m_B = 20 \text{ kg}$



$\sum F_x = A_x = 0$

$\sum F_y = A_y - 2000 - 600 - 600 + B_y = 0$

$\Rightarrow A_y = 800 \text{ N}$ ,  $\Rightarrow B_y = 2400 \text{ N}$

$\sum M_A = -0.4(2000) - \mu - 1.3(600) - 1.4(600) + 1.6(2400) = 0$

$\Rightarrow \mu = 1420 \text{ N}\cdot\text{m}$