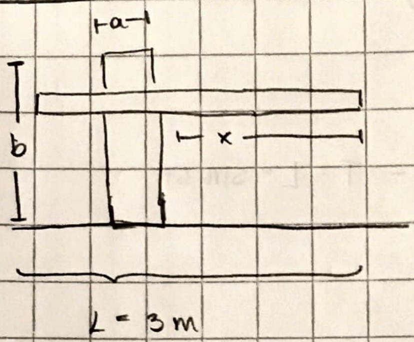
Tarea 5 Fis 110:

gaspar navarro l.
Par 21

## Problema 1:

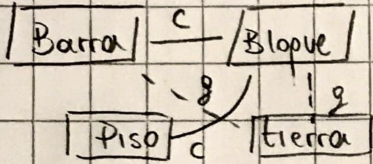
a)




b) Como F está en el cm de la barra, aquella dist desde el extremo izquierdo vale 1,5 [m], por tanto:

$$\alpha = 1{,}5 - 0{,}6 - 0{,}25$$
$$\alpha = 0{,}65\ [m].$$

$$\Rightarrow x = 3 - (0{,}65 + 0{,}6)$$
$$x = 1{,}75\ [m].$$




- $F_{tierra \to barra}$

$F_{bloque \to barra}$ ⟷

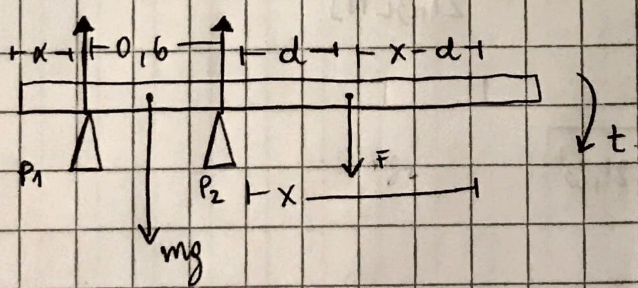
- $F_{tierra \to bloque}$

$F_{barra \to bloque}$

$F_{piso \to bloque}$

acción / rxn.

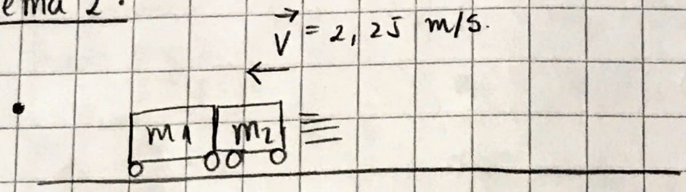
DCLE:

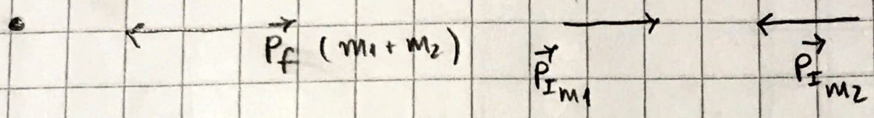



$$\sum t = 0 = -t_{mg} + t_{mg_2}$$
$$0 = (-6 \cdot 10 \cdot d) + (0{,}3 \cdot 10 \cdot 5)$$
$$0 = -60\,d + 15$$
$$\Rightarrow d = \frac{15}{60} \approx 0{,}25\ [m]$$

Problema 2:

a)




$E_{c_1}$: $(m_1 \cdot \vec{V}_{I_{m_1}}) - (m_2 \cdot \vec{V}_{I_{m_2}}) = -(\vec{V}_f\,(m_1 + m_2))$ y considerando eje de referencia.

$E_{c_2}$: $\frac{1}{2} m_1 \cdot \vec{V}_{I_{m_1}} + \frac{1}{2} m_2 \vec{V}_{I_{m_2}} = \frac{1}{2} \vec{V}_f\,(m_1 + m_2)$

b) en base a la ecuación 1:

$\Rightarrow \quad 3 \cdot 4 - m_2 \cdot 6 = -(2,25\,(3 + m_2))$

$\Leftrightarrow \quad 12 - 6m_2 = -6,75 - 2,25\,m_2$

$\Leftrightarrow \quad 18,75 = 3,75\,m_2$

$\Leftrightarrow \quad 5\ [Kg] = m_2$

c) $\Delta K = \frac{1}{2}(m_1 + m_2) \cdot V_f^2 - \left[\frac{1}{2} m_1 \cdot \vec{V}_{I_{m_1}}^2 + \frac{1}{2} m_2 \vec{V}_{I_{m_2}}^2\right]$

$= \frac{1}{2} \cdot 8 \cdot 2,25^2 - \left[\frac{1}{2} \cdot 3 \cdot 4^2 + \frac{1}{2} \cdot 5 \cdot 6^2\right]$

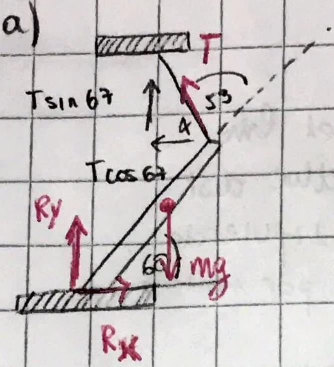
$= 20,25 - [24 + 90]$

$= -93,75\ [J].$

Problema 3:

$I\alpha =$

a)




- $R_y - mg + T\sin 67 = 0$
- $R_x - T\cos 67 = 0$
- $\sum \tau = mg \cdot \frac{L}{2} \cdot \sin 150 - T \cdot L \cdot \sin 67$

b)

$\Rightarrow m = 20\ \text{Kg}$ y $L = 4\ m$

$\Rightarrow 0 = 20 \cdot 10 \cdot \frac{4}{2} \cdot \sin 150 - T \cdot 4 \cdot \sin 67$

$0 = 200 - 3{,}68\,T$

$\frac{-200}{-3{,}68} = T$

$54{,}34\ [N] = T$

$\Rightarrow R_y = 200 - 54{,}34 \sin 67$

$= 200 - 49$

$= 151\ [N]$

$\Rightarrow R_x = 54{,}34 \cdot \cos 67$

$= 21{,}23\ [N].$

$\Rightarrow |R| = 152{,}48\ [N]. = \sqrt{151^2 + 21{,}23^2}$