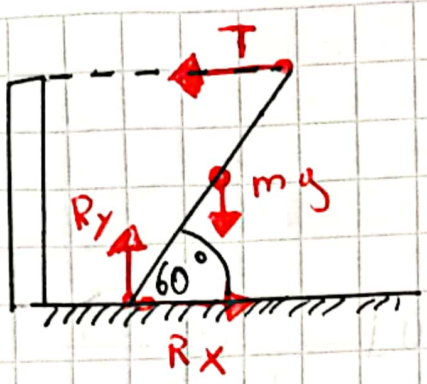
Control 5

Angelo Agostinelli
Par 19

① ⓐ



ⓑ $\sum F_{eje\ y} = \sin 60 R_y - mg = 0$

$\sum F_{eje\ x} = \cos 60 R_x - T = 0$

$\sum Torque \rightarrow \tau_{Ry} + \tau_{Rx} + \tau_T + \tau_{mg}$

- $Torque\ Ry = 0$

$Torque\ Rx = 0$

$Torque\ Tensión = T \cdot 2 \cdot \sin(60)$

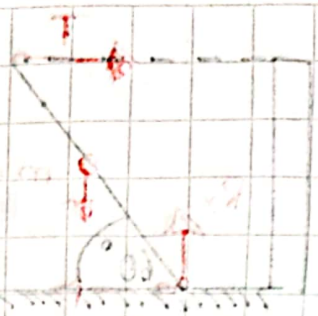
$Torque\ Peso = 8 \cdot 10 \cdot 1 \cdot \sin(30°)$

$= 40\ [Nm]$

ⓒ $\sum Torque \rightarrow \quad 40 = T \cdot 2 \cdot \sin(60)$

$T = 23,0940$

La Tensión es 23,1 [N]



- $\sin 60 \cdot R_y = mg$

$$R_y \cdot \sin 60 = 80$$

$$R_y = 92,3\ [N]$$

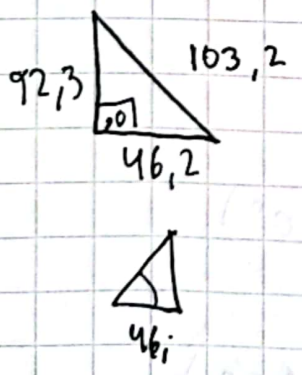
- $R_x \cdot \cos(60) = T$

$$R_x \cdot \cos(60) = 23,1$$

$$R_x = 46,2\ [N]$$

$$\|R\| = \sqrt{(92,3)^2 + (46,2)^2}$$

$$\|R\| = 103,2\ [N]$$



$$\frac{\sin(90)}{103,2} = \frac{\sin(x)}{92,3}$$

$$\theta = 63,4$$

- $\|R\| = 103,2$ con un angulo de $63,4^\circ$

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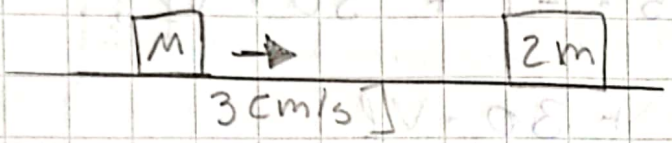
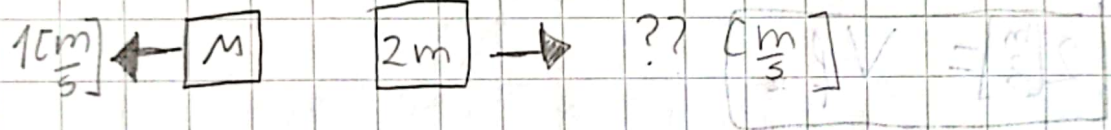
(2)

(a)

Antes del Choque

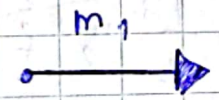


Despues

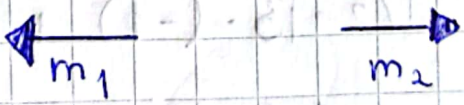


Vectores:

Antes:



Despues:



Ec

$P_{inicial}$: $m_1 \cdot V_1 + m_2 \cdot V_2$

P_{final}: $m_1 \cdot V_{f_1} + m_2 \cdot V_{2f}$

Energia K: $\frac{1}{2} m_1 v^2 = \frac{1}{2} m_1 v_1^2 + \frac{1}{2} m_2 v_{2f}^2$

$P_{inicial} = P_{final}$

(b) $m_1 \cdot v_1 + m_2 \cdot v_2 = m_1 \cdot v_{1f} + m_2 \cdot v_{2f}$

$15 \cdot 3 + 30 \cdot 0 = 15 \cdot -1 + 30 \cdot V_{f_2}$

$45 = -15 + 30 \cdot V_f$

$60 = 30\, V_{f_2}$

$\boxed{2\left[\frac{m}{s}\right] = V_{f_2}}$

La velocidad de 2m es $2\,[m/s]$

(c) $\frac{1}{2} m_1 v^2 = \frac{1}{2} m_1 v_f^2 + \frac{1}{2} m_2 v_f^2$

$1/2 \cdot 15\,(+3)^2 = 1/2 \cdot 15 \cdot (-1)^2 + 1/2 \cdot 30 \cdot 2^2$

$67{,}5 = 7{,}5 + 60$

$67{,}5\,[J] = 67{,}5\,[J]$

La Variacion de energia cinetica es $0\,[J]$