

Prueba Física.

Hoja 1.

CAD IMJ. Oliva res. S.

firma. 

Preguntas 1

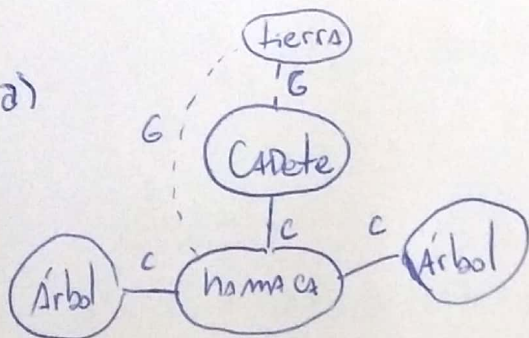
Datos



$$CAD = 60 [kg]$$

$$hamaca = 10 [kg]$$

a)



b)

Cadete.

$$\vec{F}_c = \vec{F}_{CAD - hamaca}$$

$$\vec{F}_G = \vec{F}_{Tierra - CAD} = \vec{P}_C$$

hamaca

$$\vec{T}_1 = \vec{T}_{Árbol - hamaca}$$

$$\vec{T}_2 = \vec{T}_{Árbol - hamaca}$$

$$\vec{F}_c = \vec{F}_{hamaca - CAD}$$

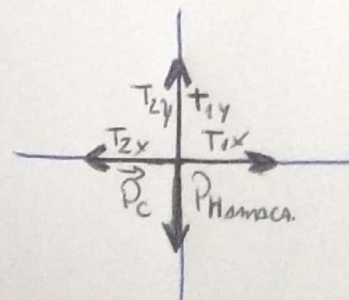
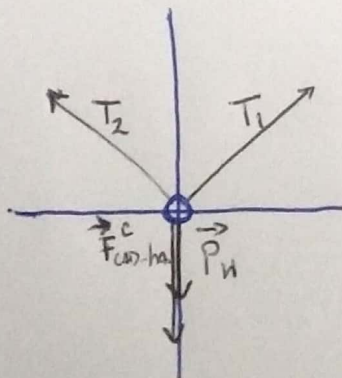
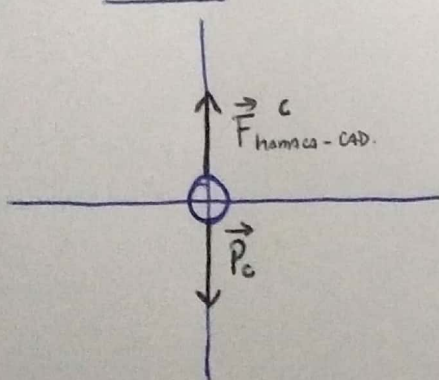
$$\vec{P}_H = \vec{F}_{Tierra - hamaca}$$

Existe un par de Acción - reacción entre el CAD. y la Hamaca:

$$\vec{F}_{hamaca - CAD} = \vec{F}_{CAD - Hamaca}$$

c)

Cadete.



d)

$$\sum \vec{F}_y = 0$$

$$\vec{P}_C = \vec{F}_{hamaca - CAD}^c$$

$$\sum \vec{F}_y = 0$$

$$T_{2y} + T_{1y} + \vec{P}_C - \vec{P}_{hamaca} = 0$$

$$\sum \vec{F}_x = 0$$

$$T_{1x} - T_{2x} = 0$$

$$T_1 = T_2$$

$$T_{2y} + T_{1y} = m_c \cdot \vec{g} - m_h \cdot \vec{g} = 0$$

$$T_{2y} + T_{1y} - 600 [N] - 100 [N] = 0$$

$$T_{2y} + T_{1y} = 700 [N]$$

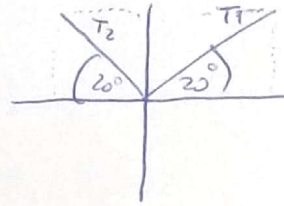
CAD J. Olivares S.

firma = Pregunta 1

$$T_1 = T_2.$$

$$\therefore T_{1x} - T_{2x} = 0.$$

$$\therefore T_{2y} + T_{1y} = 700 \text{ [N]} \rightarrow \begin{aligned} T_{1y} &= 350 \text{ [N]} \\ T_{2y} &= 350 \text{ [N]} \end{aligned}$$



$$T_{1y} = T \sin 20^\circ$$

$$350 = T \sin 20^\circ$$

$$\frac{350}{\sin 20^\circ} = T$$

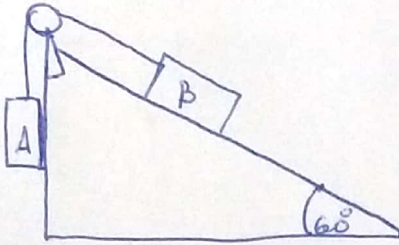
$$T = 1023,3$$

Respuesta

$$\therefore T_1 = 1023,3 \text{ [N]} \sim 1023 \text{ [N]}$$

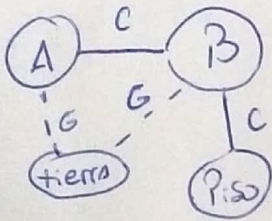
$$T_2 = 1023,3 \text{ [N]} \sim 1023 \text{ [N]}$$

Preguntas 2



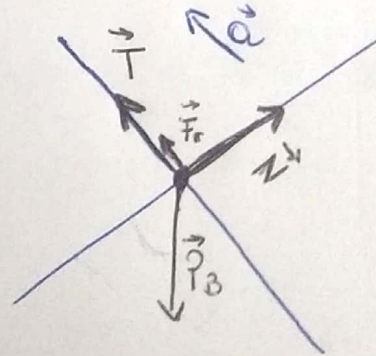
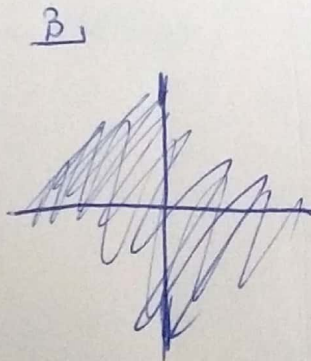
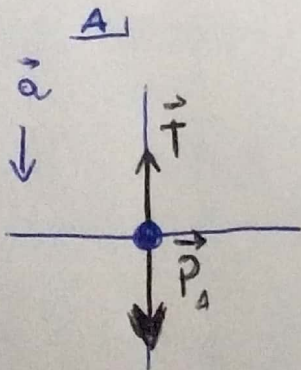
A y B = 15 kg.

coef. roce B = 0,2.



$$\begin{aligned} \vec{T} &= \vec{F}_{A-B} \\ \vec{F}_{tierra-A} &= \vec{P}_A \end{aligned}$$

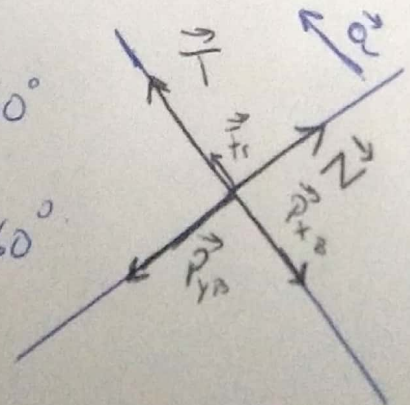
$$\begin{aligned} \vec{F}_{B-A} &= \vec{T} \\ \vec{F}_{Piso-B} &= \vec{N} \text{ y } \vec{F}_r \\ \vec{F}_{tierra-B} &= \vec{P} \end{aligned}$$

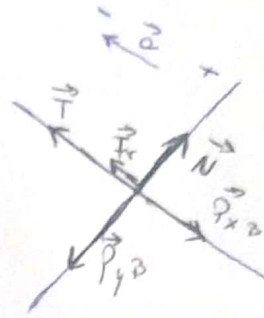
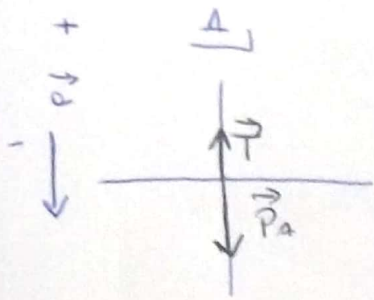


$$\vec{F} = m \cdot a$$

$$\vec{P}_{x_B} = \vec{P}_B \sin 60^\circ$$

$$\vec{P}_{y_B} = \vec{P}_B \cos 60^\circ$$





$$\vec{P}_{xB} = \vec{P}_B \sin 60^\circ$$

$$\vec{P}_{yB} = \vec{P}_B \cos 60^\circ$$

$$\vec{f}_r = \mu \cdot \vec{N}$$

$$\vec{f}_{EY} = 0$$

$$\vec{N} - \vec{P}_{yB} = 0$$

$$\vec{N} - 75 = 0$$

$$\vec{N} = 75 \text{ [N]}$$

$$\vec{f}_{EX} \neq 0$$

$$\vec{T} + \vec{f}_r - \vec{P}_{xB} \neq 0$$

$$\vec{T} + \mu \cdot \vec{N} - \vec{P}_{xB} \neq 0$$

$$\vec{T} + 0,2 \cdot 75 - 129,9 \neq 0$$

$$\vec{T} + 15 - 129,9 \neq 0$$

$$\vec{T} - 114,9 \neq 0$$

$$\vec{T} + \mu \cdot \vec{N} - \vec{P}_{xB} \neq 0$$

$$\vec{T} + 0,2 \cdot 75 - 129,9 \neq 0$$

$$\vec{T} + 15 - 129,9 \neq 0$$

$$\vec{T} - 114,9 \neq 0$$

$$\vec{P}_A = m_A \cdot \vec{g}$$

$$\vec{P}_A = 150 \text{ [N]}$$

$$\vec{T} = 150 \text{ [N]}$$

$$\vec{T} = m \cdot \vec{a}$$

$$\Sigma \vec{F} = 150 \text{ [N]} - \vec{T} + 15 \text{ [N]} - 129,9 \neq 0$$

$$\Sigma \vec{F} = -114,9$$

$$\vec{T} = m \cdot \vec{a}$$

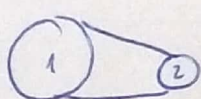
$$-114,9 = 15 \cdot \vec{a}$$

$$\vec{a} = -6,34 \frac{\text{m}}{\text{s}^2}$$

$$2) \quad 800 \frac{\text{rev}}{\text{min}} \cdot \frac{1 \text{ min}}{60 \text{ seg}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = 26,667 \pi \left[\frac{\text{rad}}{\text{seg}} \right]$$

$$26,667 \pi \left[\frac{\text{rad}}{\text{s}} \right] = 83,7 \left[\frac{\text{rad}}{\text{s}} \right] \quad \omega = 83,7 \left[\frac{\text{rad}}{\text{s}} \right]$$

b)



$$V_1 = V_2$$

$$V = \omega \cdot R$$

rueda 3,

$$V_3 = 83,7 \cdot 0,05 \text{ [m]} = V_3 = 4,185 \left[\frac{\text{m} \cdot \text{rad}}{\text{s}} \right]$$

$$V_3 = V_2$$

rueda 2,

$$V_2 = \omega \cdot R$$

$$4,185 \left[\frac{\text{m} \cdot \text{rad}}{\text{s}} \right] = \omega \cdot 0,2 \text{ [m]}$$

$$\omega = 20,9 \left[\frac{\text{rad}}{\text{s}} \right] = \omega = 21 \left[\frac{\text{rad}}{\text{s}} \right]$$

c)



$$\omega_1 = \omega_2$$

$$\omega_{\text{rueda 2}} = 21 \left[\frac{\text{rad}}{\text{s}} \right] = \omega_{\text{rueda 1}}$$

$$V_{\text{rueda 1}} = \omega_{\text{rueda 1}} \cdot R$$

$$V_1 = 21 \left[\frac{\text{rad}}{\text{s}} \right] \cdot 0,1 \text{ [m]}$$

$$V_1 = 2,1 \left[\frac{\text{m} \cdot \text{rad}}{\text{s}} \right]$$

d) $80 \text{ [cm]} \rightarrow 0,8 \text{ [m]}$

$$1 \text{ vuelta} = 2\pi \cdot R.$$

$$1 \text{ vuelta} = 2\pi \cdot 0,1 \text{ [m]}$$

$$1 \text{ vuelta} = 0,628 \text{ [m]}$$

~~80~~

$$0,628 \text{ [m]} \rightarrow 1 \text{ vuelta}$$

$$0,8 \text{ [m]} \rightarrow x \text{ vueltas}$$

$$x = 1,27 \text{ vueltas.}$$

R= La rueda 1 da 1,27 vueltas.