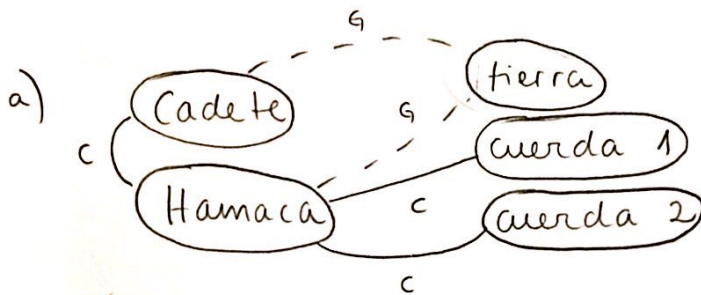


Prueba Física número 2

Maximiliano Aguirre
Bunger 21M

- 1) Cadete 60 kg
hamaca 10 kg



- b) Inventario de Fuerzas

Cadete

F_{contacto}
Hamaca $\rightarrow$ cadete : F_1

$F_{\text{gravitacional}}$
Tierra $\rightarrow$ cadete : P_1

se encuentran en
par de acción y reacción (LEY 3)

Hamaca

F_{contacto}
cadete $\rightarrow$ Hamaca : $F_2 = 600 \text{ (N)}$

F_{contacto}
cuerda 1 $\rightarrow$ Hamaca : T_1

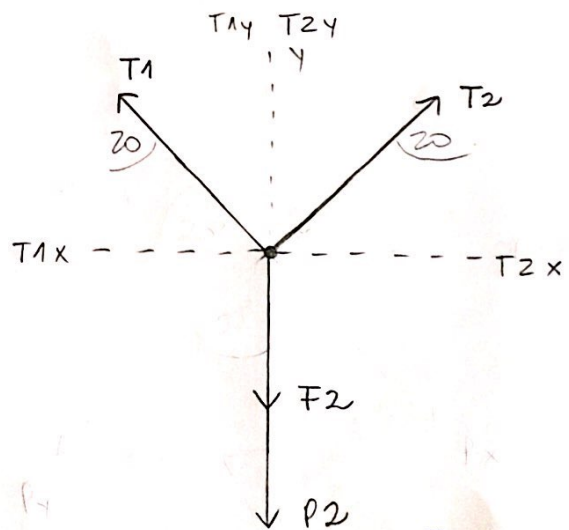
F_{contacto}
cuerda 2 $\rightarrow$ Hamaca : T_2

$F_{\text{gravitacional}}$
tierra $\rightarrow$ Hamaca : P_2

- c) D.C.L Cadete



- D.C.L Hamaca



Aguirre

$$\sin 20^\circ = \frac{T_{2x}}{T_2}$$

$$T_2 \sin 20^\circ = T_{2x}$$

$$\cos 20^\circ = \frac{T_{2y}}{T_2}$$

$$T_2 \cos 20^\circ = T_{2y}$$

$$\sin 20^\circ = \frac{T_{1x}}{T_1}$$

$$T_1 \sin 20^\circ = T_{1x}$$

$$\cos 20^\circ = \frac{T_{1y}}{T_1}$$

$$T_1 \cos 20^\circ = T_{1y}$$

Hamaca

$$T_{2y} + T_{1y} = F_z + P_z$$

$$T_2 \cos 20^\circ + T_1 \cos 20^\circ = 600 + 100$$

$$= 700 \text{ [N]}$$

$$T_2 \cdot 0,94 + T_1 \cdot 0,94 = 700 \text{ [N]}$$

$$\sum F_x = 0$$

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

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

$$T_2 \sin 20^\circ = T_1 \sin 20^\circ$$

$$T_2 \cdot 0,34 = T_1 \cdot 0,34$$

$$T_2 \cdot 0,94 + T_1 \cdot 0,94 = 700$$

$$T_2 \cdot 0,34 - T_1 \cdot 0,34 = 0 \quad | \cdot 276$$

$$T_2 \cdot 0,94 + \cancel{T_1 \cdot 0,94} = 700$$

$$T_2 \cdot 0,94 - \cancel{T_1 \cdot 0,94} = 0$$

$$T_2 \cdot 1,88 = 700$$

$$T_2 = \frac{700}{1,88} = 372,3 \text{ [N]}$$

$$T_2 = 372,3 \text{ [N]}$$

$$372,3 \cdot 0,94 + T_1 \cdot 0,94 = 700$$

$$349,96 + T_1 = 700$$

$$T_1 = 700 - 349,96$$

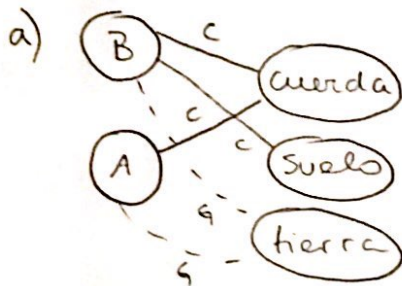
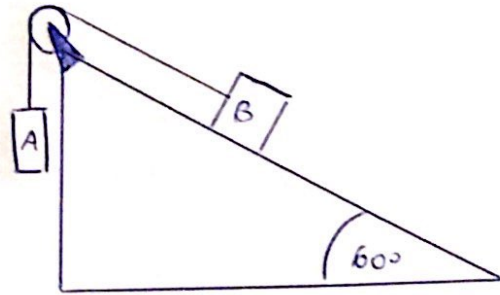
$$T_1 = 350,04 \text{ [N]}$$

AGUIRRE 6

2) A y B = misma masa.

$$\alpha = 60^\circ$$

[15 kg] = masa



Inventario de Fuerzas

A

F contacto
cuerda $\rightarrow$ A : T_A

F gravitacional
tierra $\rightarrow$ A : P_A

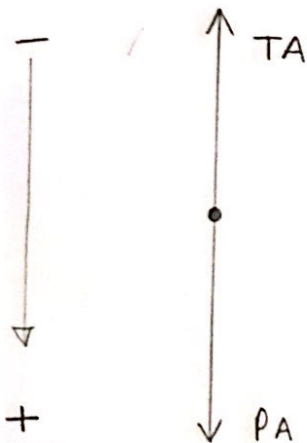
B

F contacto
cuerda $\rightarrow$ B : T_B

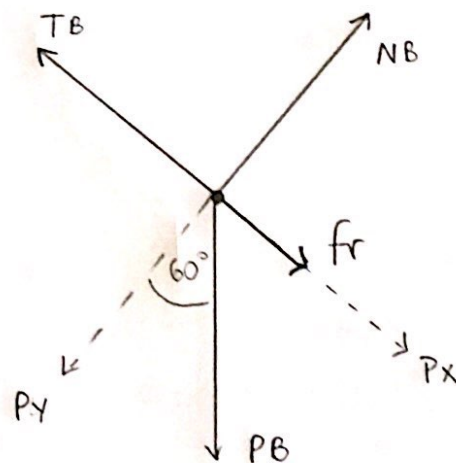
F contacto
suelo $\rightarrow$ B : $\begin{cases} N_B \\ f_r \end{cases}$

F gravitacional
tierra $\rightarrow$ B : P_B

b) D.C.L. A



D.C.L. B.



+ $\leftarrow$ $\rightarrow$ -

a

AGUIRRE

D.C.L.A

$$\sum F = m \cdot a \rightarrow 2^{\text{da}} \text{ Ley}$$

$$-T_A + P_A = m \cdot a$$

$$-T_A + 150 = 15 \cdot a$$

$$-T_A + 150 = 15a$$

CAS

III

→ Sistema de poleas
1 cuerda = misma tensión

$$-T + 150 = 15a$$

$$T - F_r - 129,9 = 15a$$

$$-F_r + 20,1 = 30a$$

$$-(\mu \cdot N) + 20,1 = 30a$$

$$-0,2 \cdot N + 20,1 = 30a$$

$$\text{aceleración} = 0,155 \left[\frac{m}{s^2} \right]$$

D.C.L.B.

Maximiliano Aguirre Bonger.

2IM

$$\text{sen } 60^\circ = \frac{P_x}{P_B}$$

$$P_B \text{ sen } 60^\circ = P_x$$

$$129,9 = P_x$$

$$\text{cos } 60^\circ = \frac{P_y}{P_B}$$

$$P_B \text{ cos } 60^\circ = P_y$$

$$75 = P_y$$

$$\sum F_x = m \cdot a$$

$$-F_r - P_x + T_B = m \cdot a$$

$$-F_r - 129,9 + T_B = 15 \cdot a$$

$$-F_r + T_B = 15a + 129,9$$

$$\sum F_y = m \cdot a$$

$$-P_y + N = m \cdot a$$

$$-75 + N = 15a$$

$$-75 + N = 15a / \cdot 0,2$$

$$-0,2N + 20,1 = 30a$$

$$-15 + 0,2 = 3a$$

$$20,1 - 0,2 = 30a$$

$$5,1 = 33a$$

$$0,155 = a$$

AGUIRRE

3)

Maximiliano Aguirre
Bunger 2im.Rueda 1

$$R_1 = 0,1 \text{ (m)}$$

Rueda 2

$$R_2 = 0,2 \text{ (m)}$$

Rueda 3

$$R_3 = 0,05 \text{ (m)}$$

800 RPM

a) $\omega = ?$

$$800 \frac{\text{rev}}{\text{min}} \cdot \frac{1 \text{ min}}{60 \text{ seg}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = 83,7 \left(\frac{\text{rad}}{\text{seg}} \right) = \boxed{84 \left[\frac{\text{rad}}{\text{seg}} \right]}$$

b) $\omega = ?$

$$R = 0,2 \text{ (m)}$$

$$V_3 = V_2$$

$$V_3 = \omega_3 \cdot R_3 \rightarrow V_3 = 83,7 \cdot 0,05 = 4,19$$

$$V_3 = 83,7 \cdot 0,05$$

$$V_3 = 4,19 \left[\frac{\text{m}}{\text{s}} \right]$$

$$4,19 = \omega_2 \cdot R_2$$

$$4,19 = \omega_2 \cdot 0,2$$

$$\frac{4,19}{0,2} = \omega_2$$

$$\omega_2 = 20,95 \left[\frac{\text{rad}}{\text{s}} \right]$$

$$\boxed{\omega_2 = 21 \left[\frac{\text{rad}}{\text{s}} \right]}$$

c) $\omega_1 = \omega_2$

$$V = 21 \cdot 0,1$$

$$\boxed{V = 2,1 \left[\frac{\text{m}}{\text{s}} \right]}$$

d) $d = \theta \cdot R$

$$0,8 = \theta \cdot 0,1$$

$$\frac{0,8}{0,1} = \theta \Rightarrow \theta = 8 \text{ rad}$$

$$2\pi \text{ rad} \rightarrow 360^\circ$$

$$8 \text{ rad} \rightarrow x$$

$$x = 458,4^\circ$$

$$\frac{458,4}{360} = \boxed{1,27 \text{ vueltas}}$$

Aguirre