

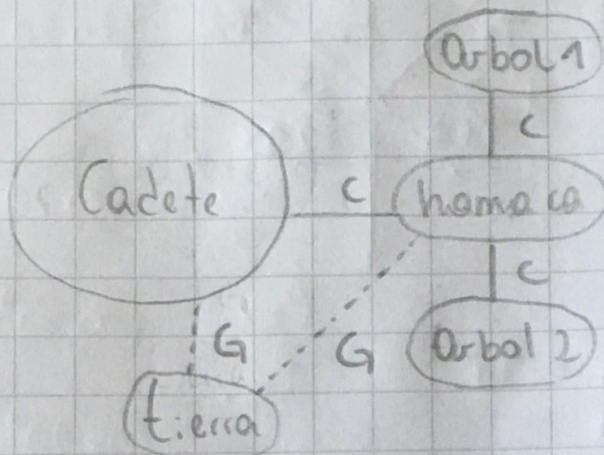
Prueba 2

2111 B. 2105 T.

[Signature]

I. Datos: masa = 60 kg.
masa hamaca = 10 kg.

a) Diagrama interacciones:



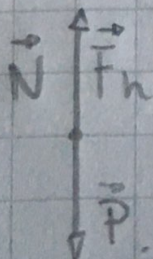
b) Inventario Fuerzas:

Cadete: $\vec{F}_{\text{contacto hamaca-cadete}} = \vec{F}_h$
 $\vec{F}_{\text{gravitacional tierra-cadete}} = \vec{P}$ } Par acción-reacción. $\vec{F}_h$ and $\vec{P}$ are shown as vertical vectors.

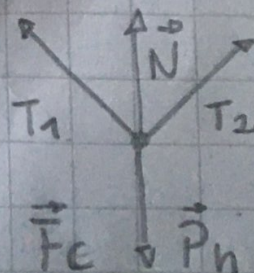
Hamaca: $\vec{F}_{\text{contacto arbol 1-hamaca}} = \vec{T}_1$
 $\vec{F}_{\text{contacto arbol 2-hamaca}} = \vec{T}_2$ } Par acción-reacción. $\vec{T}_1$ and $\vec{T}_2$ are shown as diagonal vectors.
 $\vec{F}_{\text{contacto cadete-hamaca}} = \vec{F}_c$
 $\vec{F}_{\text{gravitacional tierra-hamaca}} = \vec{P}_h$

c) D.C.L:

Cadete:

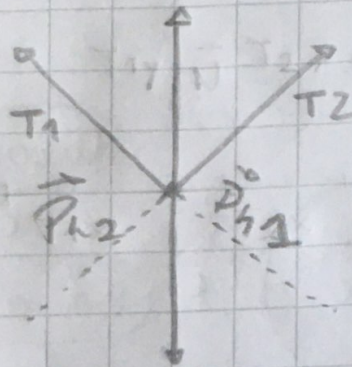
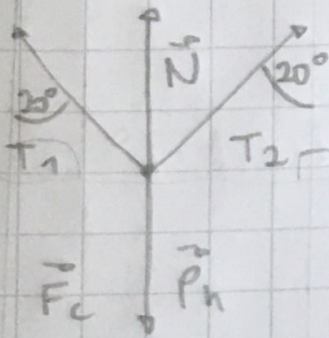


hamaca:



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d) Tensión en cada cuerda aprox. a la unidad:



$$P_{h2} = T_2 \quad P_{h1} = T_1$$

$$P_{h2} = P_h \cdot \cos(20^\circ) \\ = 100 \text{ N} \cdot \cos 20^\circ$$

$$T_2 = 94 \text{ N}$$

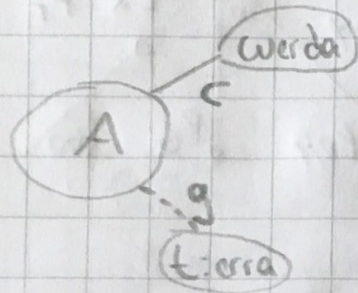
$$P_{h1} = P_h \cdot \sin 20^\circ \\ = 100 \cdot \sin 20^\circ$$

$$T_1 = 34 \text{ N}$$

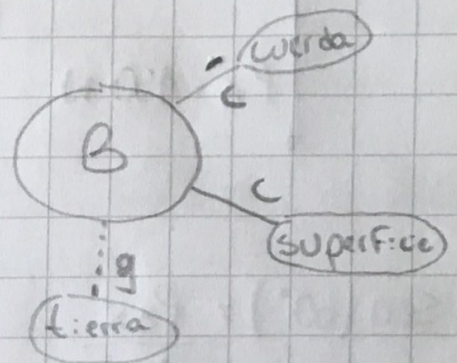
II) Datos: masa A y B = 15 kg
 $\mu_c = 0,2$

a) D.I. =

A =



B =



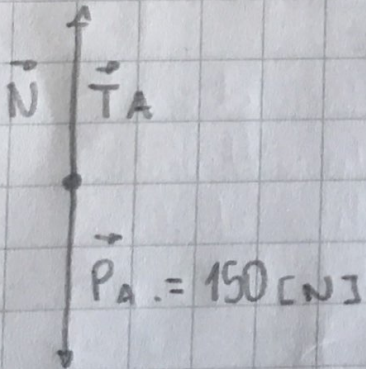
Inu. Fuerzas:

A: $\vec{F}_{\text{contacto cuerda-A}} = \vec{T}_A$
 $\vec{F}_{\text{gravitacional tierra-A}} = \vec{P}_A$

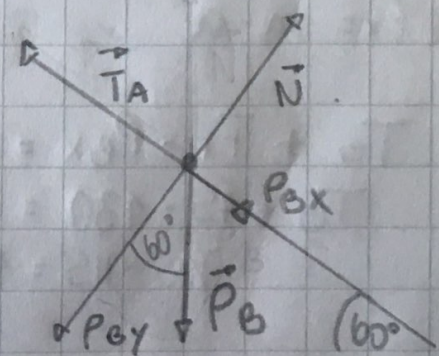
B: $\vec{F}_{\text{contacto cuerda-B}} = \vec{T}_B$
 $\vec{F}_{\text{contacto superficie-B}} = \vec{F}_R$
 $\vec{F}_{\text{gravitacional tierra-B}} = \vec{P}_B$

b) D.C.L. =

A =

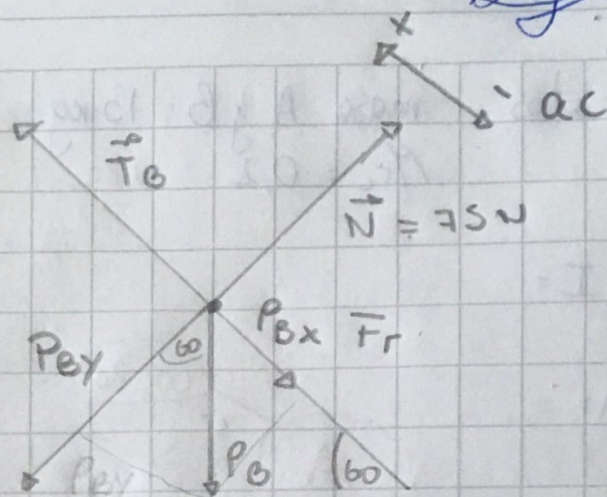
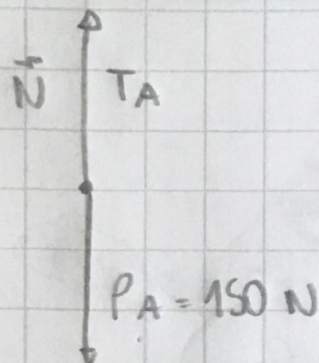


B =



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c)



$$\sin(60^\circ) = \frac{P_{Bx}}{P_B}$$

$$\cos(60^\circ) = \frac{P_{By}}{P_B}$$

$$\begin{aligned} \sin(60^\circ) \cdot 150 \text{ N} &= P_{Bx} \\ 75\sqrt{3} &= P_{Bx} \\ 130 &= P_{Bx} \end{aligned}$$

$$\begin{aligned} \cos(60^\circ) \cdot 150 \text{ N} &= P_{By} \\ 75 &= P_{By} \end{aligned}$$

$$F_{rope} = 0,2 \cdot 75 \text{ N}$$

$$F_{rope} = 15 \text{ N}$$

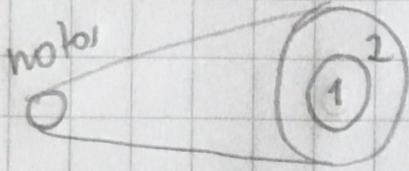
$$\sum F_x = m \cdot a$$

$$T_0 + F_{rope} \cdot P_{Bx} = m \cdot a$$

$$T_0 + 15 \cdot 130 = 15 \cdot a$$

$$T_0 - 115 = 15 \cdot a$$

III) Datos: rueda 1: $R = 0,1 \text{ m}$ rueda 2: $R = 0,2 \text{ m}$ motor: $R = 0,05 \text{ m}$
800 rpm.



a) $\omega_{\text{motor}} = \frac{800 \text{ rev}}{1 \text{ min}} = \frac{1 \text{ min}}{60 \text{ s}} = \frac{2\pi \text{ rad}}{1 \text{ rev}} = 83,8 \frac{\text{rad}}{\text{s}} \approx 84 \frac{\text{rad}}{\text{s}}$

b) $\omega_{R2} =$

R	rad/s
0,05	$\rightarrow 84$
0,2	$\rightarrow 21 \frac{\text{rad}}{\text{s}}$

c) $V_{R1} =$

R	rad/s
0,2	21
0,1	$\rightarrow 42 \frac{\text{rad}}{\text{s}}$

$\Rightarrow V = \omega \cdot R$
 $V = 42 \cdot 0,1$
 $V = 4,2 \frac{\text{m}}{\text{s}}$

d) $\theta \cdot R = d$
 $\frac{0,8 \text{ cm}}{0,1 \text{ cm}} = \theta \rightarrow 8 \text{ rad}$

2π	$\rightarrow 360^\circ$
8	$\rightarrow 458^\circ$

$360^\circ \rightarrow 1$
 $458^\circ \rightarrow 1,27 \text{ vueltas}$