Felipe Matus Díaz

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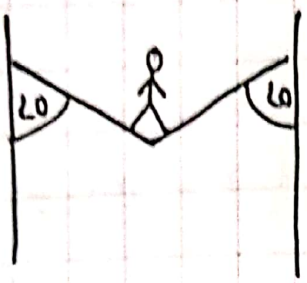
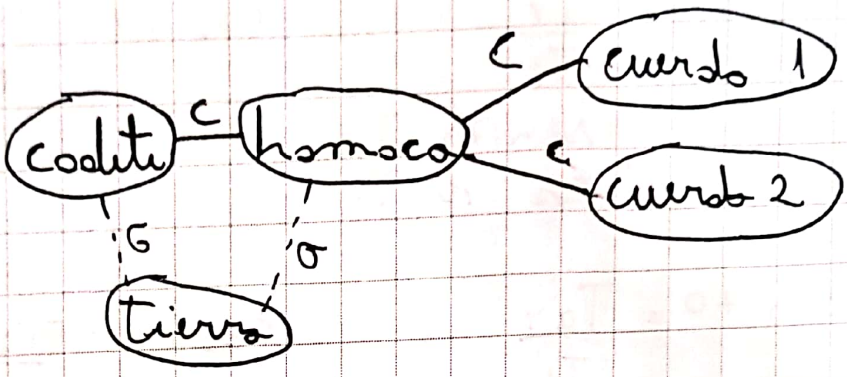
Fecha / /

1)



hamaca = 20 kg
cadete = 60 kg

a)



b) $\sum \vec{F}$ cadete

$\vec{F}$ cadete → hamaca : $\vec{F}_c$
$\vec{F}$ tierra → cadete : $\vec{P}_c$

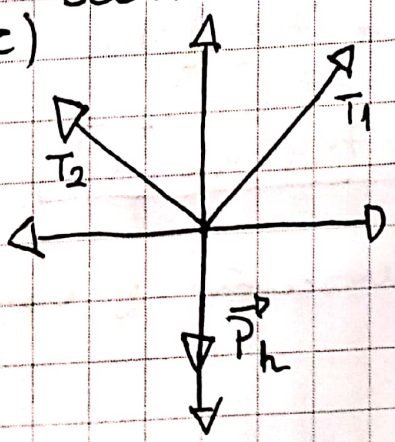
$\sum \vec{F}$ hamaca

$\vec{F}$ tierra → hamaca : $\vec{P}_h$
$\vec{F}$ cuerda 1 → hamaca : $\vec{T}_1$
$\vec{F}$ cuerda 2 → hamaca : $\vec{T}_2$
$\vec{F}$ hamaca → cadete : $\vec{F}_h$

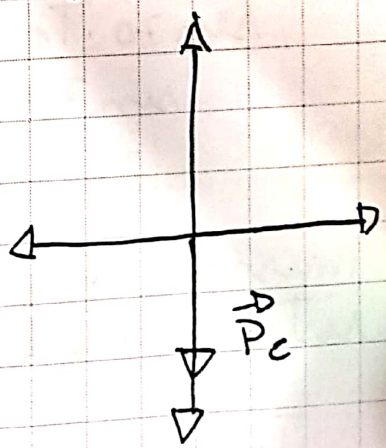
$\vec{F}_c$ y $\vec{F}_h$ son fuerzas de acción y reacción

c)

DCL. h



DCL. c



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$\vec{P} = \vec{P_c} + \vec{P_h}$

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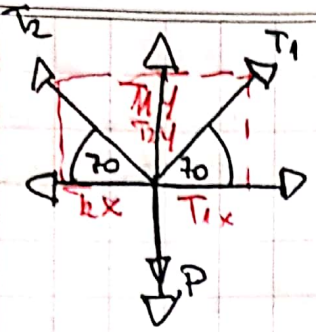
d)



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

$\text{sen } 70 = \frac{T_{1y}}{T_1}$ $\quad \cos 70 = \frac{T_{1x}}{T_1}$

$T_{1y} = \text{sen } 70 \cdot T_1$

$T_{1x} = \cos 70 \cdot T_1$

$\text{sen } 70 = \frac{T_{2y}}{T_2}$ $\quad \cos 70 = \frac{T_{2x}}{T_2}$

$T_{2y} = \text{sen } 70 \cdot T_2$

$T_{2x} = \cos 70 \cdot T_2$

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

$\vec{T}_{1y} + \vec{T}_{2y} + \vec{P} = 0$

$\vec{T}_{1y} + \vec{T}_{2y} - \vec{P} = 0$

$\vec{T}_{1y} + \vec{T}_{2y} = \vec{P}$

$\text{sen } 70 \cdot T_1 + \text{sen } 70 \cdot T_2 = 700\ [N]$

$\text{sen } 70\ (T_1 + T_2) = 700\ [N]$

$\boxed{T_1 + T_2 = 744{,}92\ [N]}$

* mismo angulo de elevación y considerando sistema ideal ; $T_1 = T_2$

$T_1 = 372{,}46\ [N]$

$T_2 = 372{,}46\ [N]$

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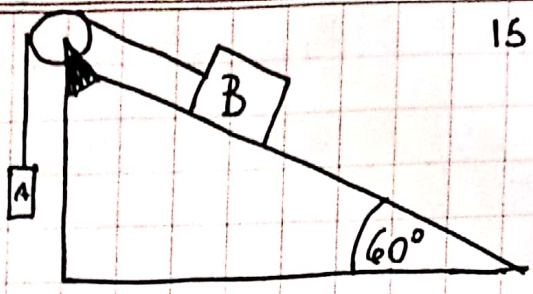
2)

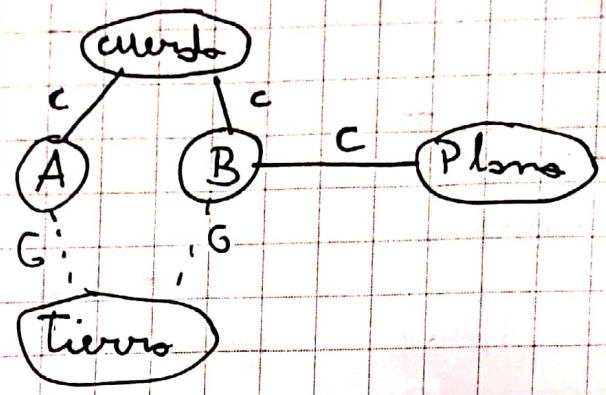


15 Kg = $m_A = m_B$

$\mu = 0,2$

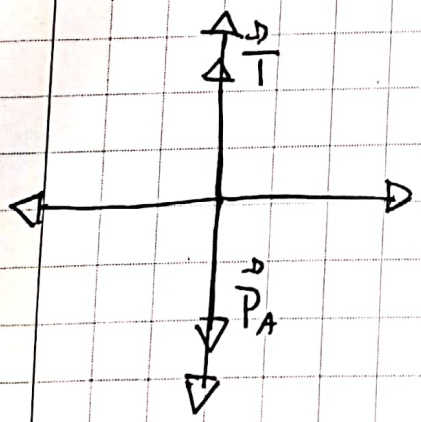
V = 2

a)

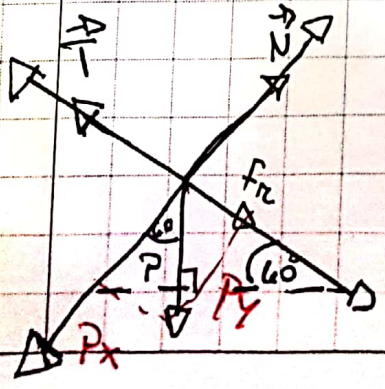


I.F. A	I.F. B
F cuerda → A : $\vec{T}$	F cuerda → B : $\vec{T}$
F tierra → A : $\vec{P_A}$	F tierra → B : $\vec{P_B}$
	F plano → B : $\vec{F_R}$

b) DCL. A



DCL. B



c)

Para A

$\sum \vec{F_y} = m \cdot a$

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

$150[N] - T = 15a$

$\boxed{T = -15a + 150[N]}$

Para B

$\sum \vec{F_y} = 0$

$\vec{N} + P_{By} = 0$

$N - P_{By} = 0$

$\vec{N} = P_{By}$

$\vec{N} = \cos 60 \cdot P$

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

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$P_{Bx} = \text{sen } 60 \cdot 150$ Fecha: / /

$P_{Bx} = 129,90$

c) $\sum \vec{F}_x \neq 0$

$\sum \vec{F}_x \rightarrow \quad T + f_R = m \cdot a$

$-15a + 150 - 0,2 \cdot 75 = \frac{P_{Bx}}{g} \cdot a$

$-15a + 150 - 0,2 \cdot 75 = 12,99 \cdot a$

$15a - 12,99\,a = 150 - 0,2 \cdot 75$

$a(15 - 12,99) = 135$

$a = 67,16 \left[\frac{m}{s^2}\right]$

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3)

a) $800 \frac{\text{rotor}}{1\text{ min}} \cdot \frac{2\pi \text{ rad}}{1\text{ rotor}} \cdot \frac{1\text{ min}}{60\text{ seg}}$

$\omega_{motor} = 26,67\pi \left[\frac{rad}{s}\right]$

b) $V = \omega \cdot R$ $\qquad V_{motor} = V_2$

$\omega_2 \cdot R_2 = \omega_{motor} \cdot R_{motor}$

$\omega_2 = \frac{\omega_{motor} \cdot R_{motor}}{R_2}$

$\omega_2 = \frac{26,67\pi \cdot 0,05}{0,2}$

$\omega_2 = 6,67\pi \left[\frac{rad}{s}\right]$

$\boxed{\omega_2 = 7\pi \left[\frac{rad}{s}\right]}$

c) $\omega_1 = \omega_2$

$\omega_1 = 7\pi \left[\frac{rad}{s}\right]$

$V_1 = \omega \cdot R$

$V_1 = 7\pi \cdot 0,1$

$\boxed{V_1 = 0,7\pi \frac{m}{s}}$

d) $\omega_1 = 7\pi \left[\frac{rad}{s}\right] \cdot \frac{1 \text{ vuelta}}{2\pi \text{ rad}}$

$= \frac{7}{2}\left[\frac{\text{vuelta}}{s}\right] = 3,5 \left[\frac{\text{vueltas}}{s}\right]$

$0,8\,m = \Theta \cdot 0,1$

$\Delta\Theta = 8$

$\Delta = \Delta\Theta \cdot 2$

$\Delta = 8 \cdot 0,1 = 0,8$ vuelt