Parcial 2

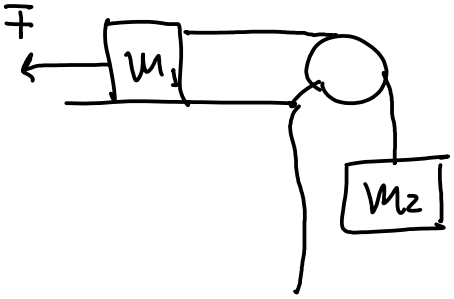
Tema 1:

$a = 0.75\ m/s^2$

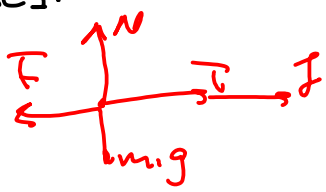
$\mu_2 = 0.2$

$m_1 = .25\ Kg$

$m_2 = 15\ Kg$



DCL 1:



DCL 2:

m_1:

$F - T - f = m_1 a$

$N = m_1 g$

$\therefore F = m_1 a + T + \mu_2 m_1 g \quad (1)$

m_2:

$m_2 a = T - m_2 g$

$\therefore T = m_2(a+g) \quad (2)$

Sust (2) en (1)

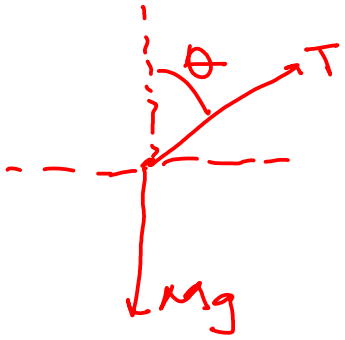
$F = m_1(a + \mu_k g) + m_2(a+g)$

$\boxed{F = 226 N}$

Tema 2:

a, M

DCL estable:



$\sum F_x = Ma$

$T\sin\theta = Ma$ (1)

$\sum F_y = 0$

$T\cos\theta = Mg$ (2)

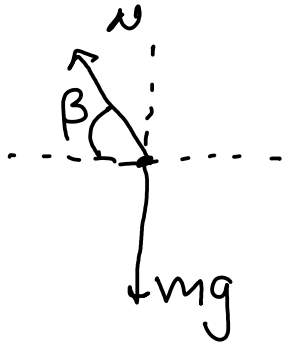
(1)/(2)

$\tan\theta = a/g \rightarrow \boxed{\theta = \tan^{-1}(a/g)} \Rightarrow$

Para T: $T = \dfrac{Mg}{\cos(\tan^{-1}(a/g))} = Mg\sqrt{1 + a^2/g^2}$

$\cos(\tan^{-1}(a/g)) = \dfrac{1}{\sqrt{1+(a/g)^2}}$

Tema 3:



$\sum F_x = ma_c$ $\qquad$ $\sum F_y = 0$

$N\cos\beta = m\frac{v^2}{R}$ $\qquad$ $N\sin\beta = mg$

$$\frac{1}{\tan\beta} = \frac{v^2}{Rg} \quad ; R = h\tan\beta$$

$$v^2 = \frac{Rg}{\tan\beta} = \frac{h\tan\beta\, g}{\tan\beta}$$

$$\boxed{v = \sqrt{9.8h}} \qquad \boxed{v = \sqrt{hg}}$$