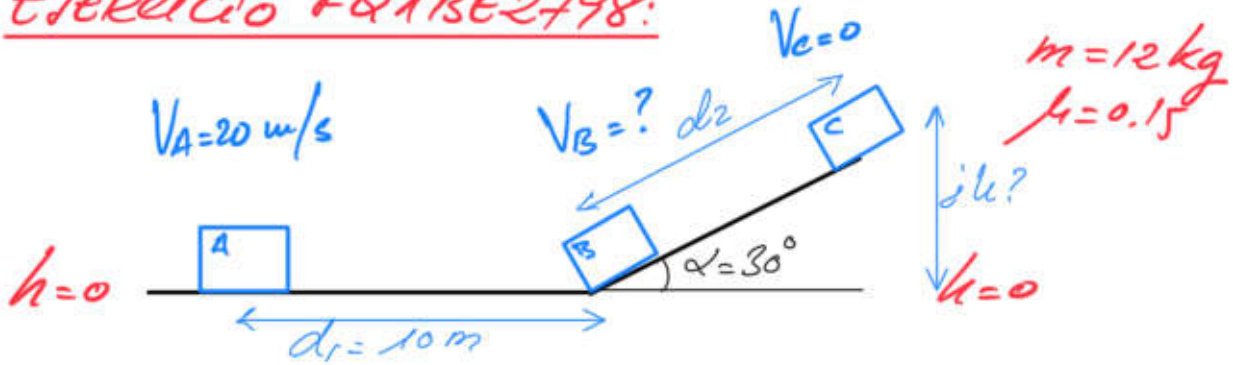
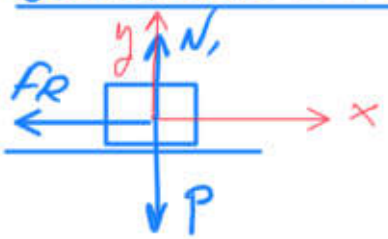
Ejercicio FQ1BE2798:



a) <u>altura que alcanza ¿h?:</u>

Se hace al final, ya que necesitamos las cosas que se solicitan

b) <u>Aceleración en el plano horizontal:</u>



$\Sigma F_y = 0$

$N_1 - P = 0$

$N_1 = P = m \cdot g$

$\Sigma F_x = m \cdot a_H$

$-fR = m \cdot a_H$

$-\mu \cdot N_1 = m \cdot a_H$

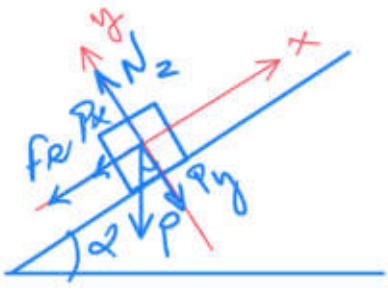
$-\mu \cdot mg = m \cdot a_H$

$a_H = -\mu \cdot g =$

$= -0,15 \cdot 9,8 =$

$$\boxed{a_H = -1,47\ m/s^2}$$

c) <u>Aceleración en plano inclinado:</u>



$P_x = mg\,sen\,\alpha$

$P_y = mg\cos\alpha$

$\Sigma F_y = 0$

$N_2 - P_y = 0 \Rightarrow N_2 = P_y$

$\Sigma F_x = m \cdot a_I$

$-fR - P_x = m \cdot a_I$

$-\mu \cdot N_2 - mg\,sen\,\alpha = m \cdot a_I$

$-\mu \cdot mg\cos\alpha - mg\,sen\,\alpha = m \cdot a_I$

$a_I = -0.15 \cdot 9,8 \cdot \cos 30 - 9,8 \cdot sen\,30$

$a_I = -1,27 - 4,9 \Rightarrow$ $\boxed{a_I = -6,17\ m/s^2}$

d) $V_B = ?$

$W_{NC} = \Delta E$

$W_{FR} = E_B - E_A$

$F_R \cdot d \cdot \cos 180 = (E_c + E_p)_B - (E_c + E_p)_A$

$-\mu \cdot N_1 \cdot 10 = \frac{1}{2} m v_B^2 - \frac{1}{2} m v_A^2$

$-\mu \cdot m \cdot g \cdot 10 = \frac{1}{2} m v_B^2 - \frac{1}{2} m \cdot 20^2$

$-0.15 \cdot 9,8 \cdot 10 = \frac{1}{2} v_B^2 - 200$

$-14,7 = \frac{1}{2} v_B^2 - 200 \Rightarrow -14,7 + 200 = \frac{1}{2} v_B^2$

$2 \cdot 185,3 = v_B^2$

$\boxed{v_B = \sqrt{370,6} = 19,25 \text{ m/s}}$

e) Trabajo Total de F_R:

$W_{FR_1} = F_{R_1} \cdot d_1 \cdot \cos 180 = -\mu \cdot N_1 \cdot d_1$

$W_{FR_2} = F_{R_2} \cdot d_2 \cdot \cos 180 = -\mu \cdot N_2 \cdot d_2$

$W_{FR_1} = -0.15 \cdot m \cdot g \cdot 10 = -0.15 \cdot 12 \cdot 9,8 \cdot 10$

$\boxed{W_{FR_1} = -176,4 \text{ J}}$

$W_{FR_2} \Rightarrow$ Pendiente de calcular el espacio (d_2) que recorre en el plano inclinado:

¿d_2? $\Rightarrow$ $v_0 = 19,25$ m/s

$a = -6,17$ m/s^2

$v = 0$

MRUA $\Rightarrow$ $v = v_0 + at \Rightarrow 0 = 19,25 - 6,17t$

$t = \frac{19,25}{6,17} = 3,12$ s

$$S = S_0 + V_0 t + \frac{1}{2} a t^2$$

$$S = 19,25 \cdot 3,12 + \frac{1}{2}(-6,17) \cdot 3,12^2$$

$$S = d_2 = 30,03 \text{ m}.$$

$$W_{fr_2} = -\mu \cdot m \cdot g \cdot \cos\alpha \cdot d_2$$

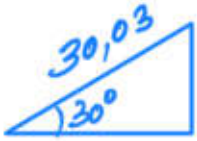
$$= -0,15 \cdot 12 \cdot 9,8 \cdot \cos 30 \cdot 30,03$$

$$\boxed{W_{fr_2} = -458,76 \text{ J}}$$

$$W_{TOTAL} = W_{fr_1} + W_{fr_2} = -176,4 - 458,76$$

$$\boxed{W_{TOTAL} = -635,16 \text{ J}}$$

a) Altura que alcanza



$$\Rightarrow \operatorname{sen} 30 = \frac{h}{30,03}$$

$$h = 30,03 \cdot \operatorname{sen} 30$$

$$\boxed{h = 15,02 \text{ m}}$$