

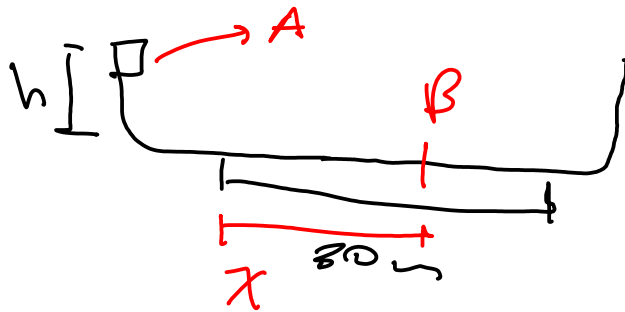
TALLER 9

Tema 1

$$m = 2 \text{ Kg}$$

$$h = 4 \text{ m}$$

$$\mu = 0.2$$



a)

$$E_{\text{in A}}: E_0 = mgh$$

$$E_{\text{in B}}: E_f = 0$$

$$\Delta E = W_{\text{fric}}$$

$$E_f - E_0 = -mg\mu x$$

$$mgh = mg\mu x$$

$$\frac{h}{\mu} = x = 20 \text{ m}$$

b)

$$W_f = -mg\mu x = -78.4 \text{ J}$$

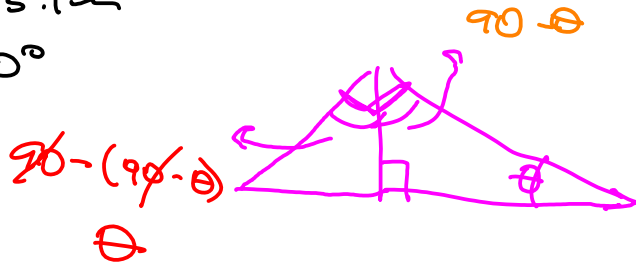
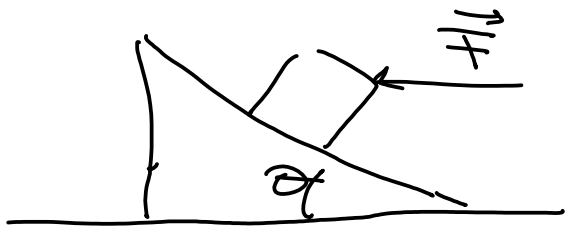
Tema 2

$$F = 16 \text{ N}$$

$$\mu = 0.2$$

$$\Delta x = 3.1 \text{ m}$$

$$\theta = 20^\circ$$



DCL:

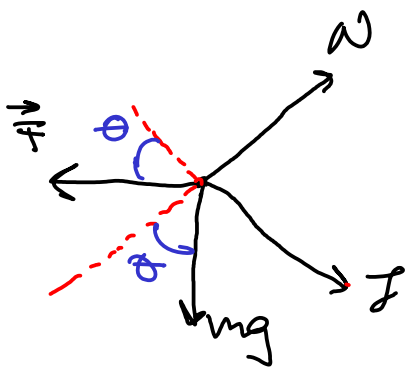
$$\sum F_y = 0$$

$$N = F \sin \theta + mg \cos \theta$$

$$\sum F_x = ma = F_{\text{netA}}$$

$$F_{\text{netA}} = F \cos \theta - mg \sin \theta - f$$

$$F_{\text{netA}} = F \cos \theta - mg \sin \theta - N \mu$$



$$F_{\text{netA}} = F(\cos \theta - \mu \sin \theta) - mg(\sin \theta + \mu \cos \theta)$$

$$W_{\text{netO}} = \vec{F}_{\text{netA}} \cdot \Delta \vec{x} = 7.796 \text{ J}$$

b)

$$v_0 = 0.0 \text{ m/s}$$

$$v_f = ?$$

$$W_{\text{netO}} = \Delta K = \frac{1}{2} m (v_f^2 - v_0^2)$$

$$v_f = \sqrt{\frac{2W_{\text{netO}}}{m} + v_0^2} = 2.78 \text{ m/s}$$

Tema 3

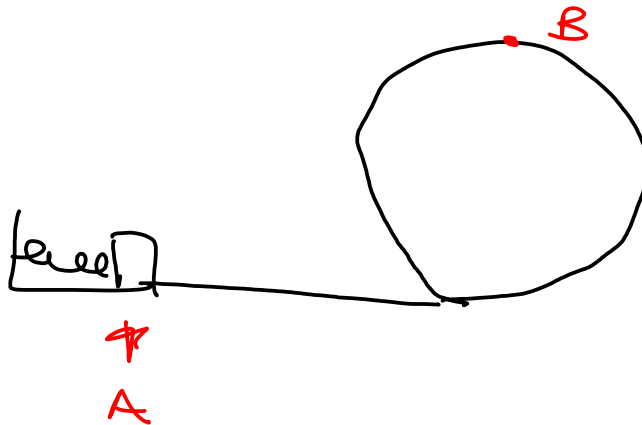
$$m = 5 \text{ kg}$$

$$k = 900 \text{ N/m}$$

$$R = 1 \text{ m}$$

$$g = 10 \text{ m/s}^2$$

$$U = 2mg$$



$$E_o = \frac{1}{2} k x^2$$

$$E_f = \frac{1}{2} m v^2 + mg(2R)$$



$$\sum F_g = m \frac{v^2}{R}$$

$$m \frac{v^2}{R} = N + mg = 3mg$$

$$v = \sqrt{3Rg}$$

$$\Delta E = 0$$

$$\frac{1}{2} k x^2 = \frac{1}{2} m v^2 + 2mgR$$

$$\frac{7}{2} mgR = \frac{1}{2} k x^2$$

$$x = \sqrt{\frac{7mgR}{k}} = \boxed{0.62 \text{ m}}$$