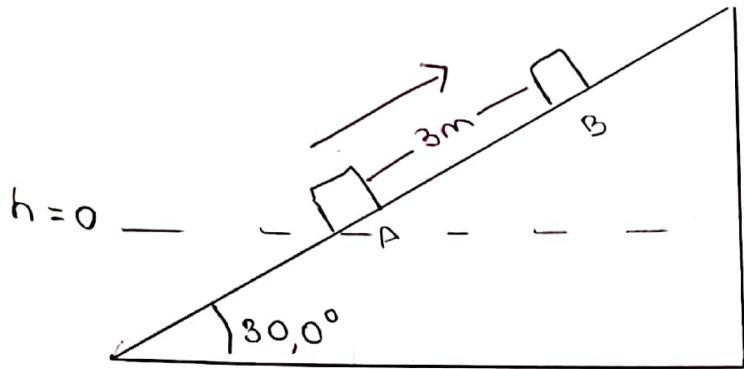


Prueba nº4 Física

Sofía Silva,

20°C

⑦



$$\begin{aligned} m &= 5 \text{ kg} \\ v &= 8,0 \text{ m/s} \\ d &= 3 \text{ m} \\ \theta &= 30^\circ \\ \mu &= ? \end{aligned}$$

$$\Delta E = -W_{\text{roce}}$$

$$E_B - E_A = -f_r \cdot \Delta x$$

$$E_B = K_B + U_B$$

$$= \frac{1}{2} m v^2 + m \cdot g \cdot h$$

$$E_B = 5 \cdot 10 \cdot (h) \cdot 3 \cdot \sin 30$$

$$E_B = 75 \text{ J}$$

$$E_A = K_A + U_A$$

$$= \frac{1}{2} m v^2 = \frac{1}{2} 5 \cdot 8$$

$$= 160 \text{ J}$$

$$E_B - E_A = -f_r \cdot \Delta x$$

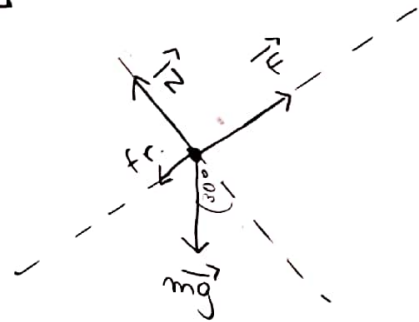
$$75 \text{ J} - 160 \text{ J} = -f_r \cdot 3$$

$$-85 \text{ J} = -25\sqrt{3} \cdot \mu_k \cdot 3$$

$$-28,3 = -25\sqrt{3} \cdot \mu_k$$

$$\boxed{0,65 = \mu_k}$$

el coeficiente de roce es 0,65



$$\Sigma F = 0$$

$$x: \vec{F} - f_r - \text{sen } 30 = 0$$

$$\vec{F} - \mu \cdot N - mg \cdot \text{sen } 30 = 0$$

$$y: \Sigma F = 0$$

$$\vec{N} - mg \cos 30 = 0$$

$$\vec{N} = 5 \cdot 10 \cdot \frac{\sqrt{3}}{2}$$

$$\boxed{\vec{N} = 25\sqrt{3}}$$

$$f_r = N \cdot \mu_k$$

$$f_r = 25\sqrt{3} \cdot \mu_k$$

② $v = 8 \text{ m/s}$

Antes



$$\vec{p}_i = \vec{p}_f$$

eje x :

$$p_{ix} = p_{fx}$$

$$8 \text{ m} = 20 \cdot \cos 37 \cdot \frac{m}{2} + \frac{m}{2} v_{fz}$$

$$8 \text{ m} = 7,99 \text{ m} + \frac{m}{2} \cdot v_{fz}$$

$$0,04 \text{ m} = \frac{m}{2} \cdot v_f$$

$$0,02 = v_{fx}$$

eje y =

$$0 = 20 \cdot \sin 37 \cdot \frac{m}{2} + \frac{m}{2} v_{fyz}$$

$$-6,02 \text{ m} = \frac{m}{2} \cdot v_{fyz}$$

$$-12,04 = v_f$$

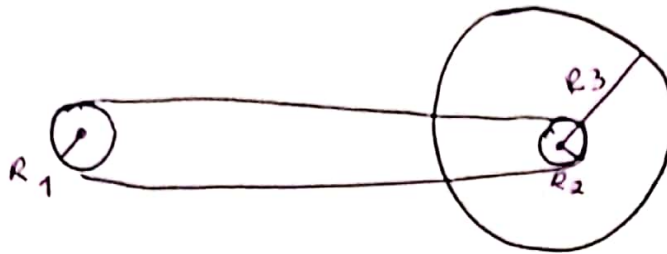
$$v = \sqrt{0,02^2 + 12,04^2}$$

$$v = 12,04 \text{ m/s}$$

$$\alpha = \tan^{-1} \left(\frac{12,04}{0,02} \right)$$

$$\alpha = 89,90^\circ$$

③



$$R_1 = 10 \text{ cm} \rightarrow 0,1 \text{ m}$$

$$R_2 = 4 \text{ cm} \rightarrow 0,04 \text{ m}$$

$$R_3 = 40 \text{ cm} \rightarrow 0,4 \text{ m}$$

$$d = 314 \text{ m}$$

$$t = 30$$

a) n° de vueltas, cuyo radio es R_3

$$d = 2\pi \cdot r \Rightarrow d = 2\pi \cdot 0,4$$

$$= 2,512$$

$$\text{n° vueltas} = \frac{314 \text{ m}}{2,512 \text{ m}} = 125 \quad \hookrightarrow \text{es el n° de vueltas}$$

b)

$$\omega = \frac{\Delta\theta}{\Delta t}$$

$$\omega = \frac{d}{R_3 \cdot \Delta t} = \frac{314}{0,4 \cdot 30}$$

$$\omega = 26,16 \frac{\text{rad}}{\text{seg}}$$

c) $\omega_2 = \omega_1$ las velocidades tangenciales en R_1 y R_2 es la misma

$$v_1 = v_2$$

$$R_1 \cdot \omega_1 = R_2 \cdot \omega_2$$

$$0,1 \cdot \omega_1 = 0,04 \cdot 26,16$$

$$\omega = \frac{1,0464}{0,1}$$

$$\omega = 10,46 \frac{\text{rad}}{\text{seg}}$$