

Álvaro Luis Antonio Jachura Gutiérrez

2º ECO

1) $m = 5 \text{ kg}$ $d = 3 \text{ m}$

$v_i = 8 \text{ m/s}$ $\theta = 30^\circ$

$v_f = 0 \text{ m/s}$ $h = 3 \sin(30^\circ)$

$$U_g = 5 \text{ kg} \cdot 10 \frac{\text{m}}{\text{s}^2} \cdot 3 \sin 30^\circ \quad K = \frac{1}{2} \cdot 5 \text{ kg} \cdot \frac{64 \text{ m}^2}{\text{s}^2}$$

$$= 75 \quad = 160$$

$\Delta E = W_{fnc}$

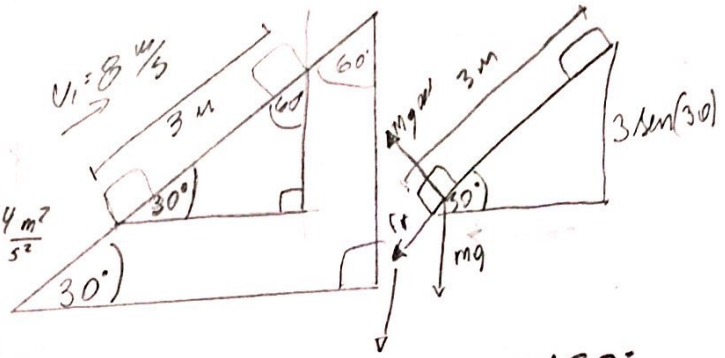
$U_g - K = F_r \cdot d \cdot \cos 180^\circ$

$m \cdot g \cdot h - \frac{1}{2} \cdot m \cdot v^2 = m g \cos 30^\circ \cdot \mu \cdot 3 \cdot (-1)$

$75 - 160 = -129,9 \mu$

$\frac{-85}{-129,9} = \mu$

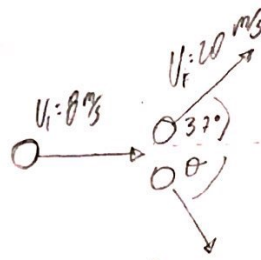
$\mu = 0,65$



force op. al mov $\theta = 180^\circ$

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① $v_i = 8 \left[\frac{m}{s} \right]$ $2^\circ \in \infty$



Eje X

$$P_{ix} = P_{fx}$$

$$m_{AB} \cdot v_{iAB} = m_A \cdot v_A' + m_B \cdot v_b'$$

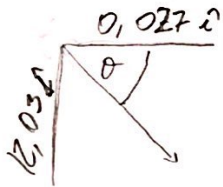
$$8 m_{AB} = m \cdot 20 \cos 37 + m \cdot v_b' \cos \theta$$

$$8 \cdot (2m) = m \cdot (20 \cos 37 + v_b' \cos \theta)$$

$$16 = (20 \cos 37 + v_b' \cos \theta)$$

$$v_b' \cos \theta = 0,027 \text{ (m/s)}$$

$$v_{bx}' = \frac{0,027}{\cos \theta}$$



$$0,027 \cdot \tan \theta = -12,03$$

$$\tan \theta = \frac{-12,03}{0,027} = -445,5$$

$$\arctan \Rightarrow \theta = -89,87^\circ$$

$$v_{bx}' = \frac{0,027}{\cos(-89,87)} = 15,5 \text{ (m/s)}$$

$$v_{by}' = \frac{-12,03}{\sin(-89,87)} = 12,03 \text{ (m/s)}$$

$$|v_b'| = \sqrt{(15,5)^2 + (12,03)^2}$$

$$v_b' = 19,62 \left[\frac{m}{s} \right]$$

Eje Y

$$P_{iy} = P_{fy}$$

$$0 = m_A \cdot v_A' + m_B \cdot v_b'$$

$$m \cdot v_b' \sin \theta = -\frac{1}{m} \cdot 20 \sin 37$$

$$v_b' \sin \theta = -20 \sin 37^\circ$$

$$v_{by}' \sin \theta = -12,03 \text{ (m/s)}$$

$$v_{by}' = \frac{-12,03}{\sin \theta}$$

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2º Eco

③ $d = 314 \text{ [m]}$ $v = \frac{d}{t} = \frac{314}{30} = 10,47 \left[\frac{\text{m}}{\text{s}} \right]$

$t = 30 \text{ [s]}$

$R_1 = 0,1 \text{ [m]}$

$\omega_1 = 10,47$

$R_2 = 0,04 \text{ [m]}$

$\omega_1 = 104,7 \left[\frac{\text{rad}}{\text{s}} \right]$

$R_3 = 0,4 \text{ [m]}$

$\omega_3 = \frac{10,47 \text{ m/s}}{0,4 \text{ m}} = 26,175 \left[\frac{\text{rad}}{\text{s}} \right]$

a) $P_3 = 2\pi \cdot R = 2\pi \cdot 0,4 \text{ m} = 2,513 \text{ m}$

1 vuelta $\rightarrow 2,513 \text{ m}$

x $\rightarrow 314 \text{ m}$

$x = 124,95 \approx 125 \text{ vueltas en } 30 \text{ [s]}$

b) $\overline{\omega}_3 = \frac{10,47 \text{ m/s}}{0,4 \text{ m}} = 26,175 \approx 26,2 \left[\frac{\text{rad}}{\text{s}} \right]$

c) $\omega_2 = \omega_3$ $v_1 = v_2$

$26,175 = \frac{v}{0,04} \Rightarrow v_2 = 1,047 \text{ m/s} = v_1$

$v_1 = \omega \cdot R \Rightarrow 1,047 \text{ m/s} = \omega \cdot 0,1$

$\omega_1 = 10,47 \left[\frac{\text{rad}}{\text{s}} \right]$

