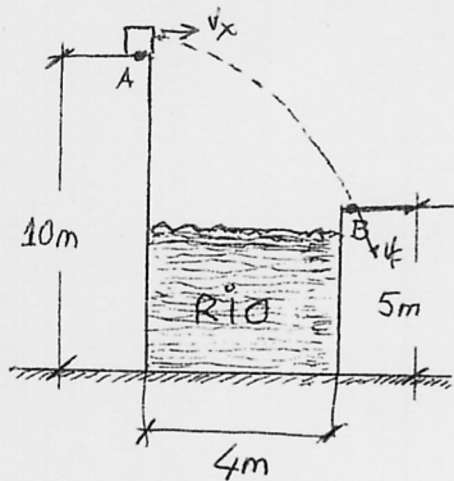


SOLUCIONES 23/11/06



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

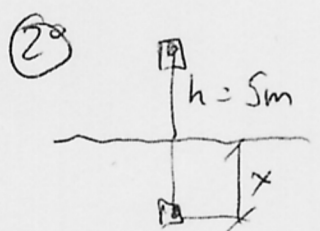
$$1) 10-5 = \frac{1}{2} g t^2 \Rightarrow t^2 = 1 \Rightarrow t = 1 \text{ s}$$

$$2) \frac{1}{2} m v_x^2 + m g \Delta h = \frac{1}{2} m v_F^2 \Rightarrow \frac{1}{2} 4^2 + 10 \cdot 5 = \frac{1}{2} v_F^2$$

$$4 = v_x \cdot t \Rightarrow v_x = \frac{4}{1} = 4 \text{ m/s} \quad \left| \quad v_F = \sqrt{116} = 10.77 \text{ m/s} \right|$$

$$3) m_p v_p = (m_p + m_b) v_x$$

$$\left| \quad v_p = \frac{m_p + m_b}{m_p} v_x = \frac{0.01 + 1}{0.01} \cdot 4 = 404 \text{ (m/s)} \right|$$



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

$$t_T = t_1 + t_2 + t_3 \quad h = v_0 t_1 + \frac{1}{2} g t_1^2 = \frac{1}{2} g t_1^2 \Rightarrow t_1 = \sqrt{\frac{2h}{g}} = \sqrt{\frac{2 \cdot 5}{10}} = 1 \text{ s} = t_1$$

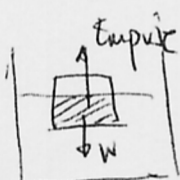
$$t_2 = t_3 = \text{POR SIMETRÍA} = \sqrt{\frac{2 \cdot 5}{10}} = 1 \text{ s} = t_1$$

$$m g - \underbrace{p}_{\text{EMPUJE}} g V = m a \quad \left| \quad a = \frac{p g - p a g}{p} = g \left(\frac{p - p a g}{p} \right) = 10 \frac{0.8 - 1}{0.8} \right.$$

$$p g - p a g = p a \quad \left. \right| = -2.5 \text{ m/s}^2$$

$$v_F^2 - v_0^2 = 2 a x \Rightarrow 0^2 - 10^2 = 2 \cdot (-2.5) x \Rightarrow \left| \quad x = \frac{100}{5} = 20 \text{ m} \right|$$

$$v_0 = g t_1 = 10 \cdot 1 = 10 \text{ m/s}$$



$$a = \frac{v_F - v_0}{t_2} = \frac{0 - 10}{t_2} = -2.5 \Rightarrow \left| \quad t_2 = 4 \text{ s} \right| = t_3$$

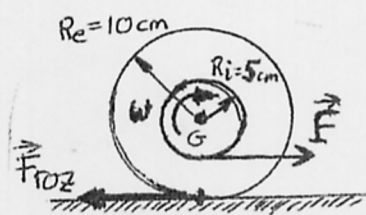
$$\left| \quad t_T = 1 + 4 + 4 = 9 \text{ s} \right|$$

$$P_{\text{emp}} = \text{Empuje} \rightarrow m g = p a g V_s = p c V_T g \Rightarrow V_s = \frac{p c}{p a g} V_T = \frac{0.8}{1} V_T = 0.8 V_T$$

$$\% = \left| 80\% \text{ SUMERGIDO} \right|$$

30

$$I_G = m K^2 = 50 \cdot 0.08 = 0.32 \text{ kg m}^2$$



$$\Sigma M_G = I_G \alpha \Rightarrow -30 \cdot 0.05 + F_{\text{roz}} \cdot 0.1 = 0.32 \Rightarrow -150 + 10 F_{\text{roz}} = 320$$

$$\Sigma F = m a \Rightarrow F - F_{\text{roz}} = m a \Rightarrow 30 - F_{\text{roz}} = 50 a$$

$$\left| \quad a = \frac{150}{820} = 0.183 \text{ m/s}^2 \right| \quad F_{\text{roz}} = 20.85 \text{ N} \Rightarrow \left| \quad \mu = \frac{F_{\text{roz}}}{N} = \frac{20.85}{500} = 0.04 \right|$$

$$v_F = a t = 0.183 \cdot 2 = 0.366 \text{ (m/s)} \quad \left| \quad E_c = \frac{1}{2} 50 \cdot (0.366)^2 = 3.35 \text{ J} \right|$$