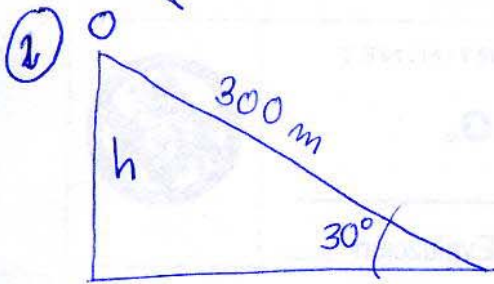


Segunda Evaluación



$$\text{sen } 30^\circ = \frac{h}{300} \rightarrow h = 300 \cdot \text{sen } 30^\circ$$

$$h = 150 \text{ m}$$

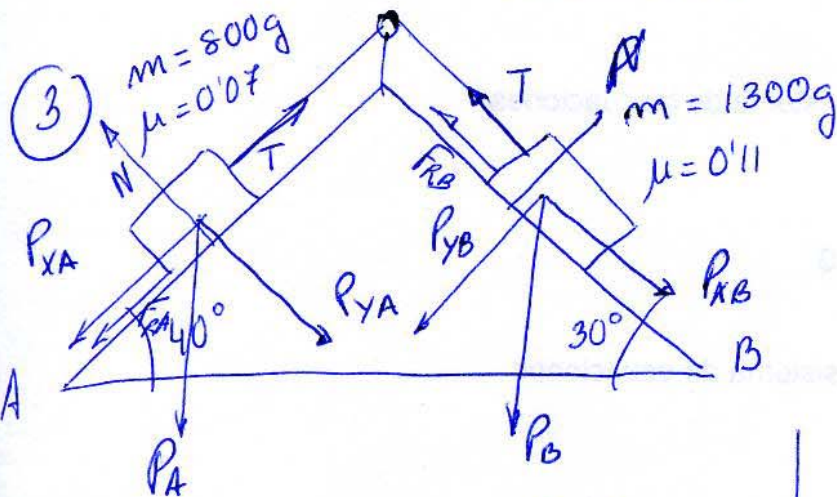
$$m = 300 \text{ g} = 0.3 \text{ Kg}$$

$$E_{pi} = E_{cf}$$

$$mgh_i = \frac{1}{2} m v_f^2$$

$$0.3 \cdot 9.81 \cdot 150 = \frac{1}{2} \cdot 0.3 \cdot v_f^2 \Rightarrow v_f = \sqrt{\frac{2 \cdot 0.3 \cdot 9.81 \cdot 150}{0.3}}$$

$$v_f = 54.24 \text{ m/s}$$



(A) $m_A = 800 \text{ g} = 0.8 \text{ Kg}$

$$P_A = 0.8 \cdot 9.81 = 7.8 \text{ N}$$

$$P_{xA} = P_A \cdot \text{sen } \alpha = 7.8 \cdot \text{sen } 40^\circ$$

$$P_{xA} = 5.01 \text{ N}$$

$$P_{yA} = P_A \cdot \text{cos } \alpha = 7.8 \cdot \text{cos } 40^\circ$$

$$P_{yA} = 5.97 \text{ N} \equiv N_A$$

$$F_{RA} = N_A \cdot \mu = 5.98 \cdot 0.07 = 0.41 \text{ N}$$

(B) $m_B = 1300 \text{ g} = 1.3 \text{ Kg}$

$$P_B = m_B \cdot g = 1.3 \cdot 9.81 = 12.7 \text{ N}$$

$$P_{xB} = P_B \cdot \text{sen } \beta = 12.7 \cdot \text{sen } 30^\circ = 6.35 \text{ N}$$

$$P_{yB} = P_B \cdot \text{cos } \beta = 12.7 \cdot \text{cos } 30^\circ = 11 \text{ N} \equiv N_B$$

$$F_{RB} = N_B \cdot \mu = 11 \cdot 0.11 = 1.21 \text{ N}$$

$$P_B - F_{RB} - T = m_B \cdot a$$

$$T - P_A - F_{RA} = m_A \cdot a$$

$$P_B - P_A - F_{RB} - F_{RA} = (m_A + m_B) \cdot a$$

$$P_{xB} > P_{xA}$$

cont...

$$6'37 - 5'01 - 0'41 - 1'21 = (0'8 + 1'3) \cdot a \\ - 0'26 = 2'1a \quad \underline{a \text{ negative}}$$

EP sistema uo se uvere

$$\textcircled{4} \quad g = G \cdot \frac{M_p}{R_p^2} \quad M_p = ? \\ g = 11 \text{ m/s}^2 \\ G = 6'67 \cdot 10^{-11} \\ R_p = 24746 \text{ km} = 2'47 \cdot 10^7 \text{ m}$$

$$M_p = \frac{g \cdot R_p^2}{G} = \frac{11 \cdot (2'47 \cdot 10^7)^2}{6'67 \cdot 10^{-11}} = 1 \cdot 10^{26} \text{ kg}$$

$$b) P = m \cdot g = 75 \cdot 11 = \underline{825 \text{ N}}$$

$$c) F_c = F_g \quad \frac{m_{\text{SAT}} \cancel{v_{\text{SAT}}^2}}{\cancel{R}} = G \frac{M_p \cdot \cancel{m_{\text{SAT}}}}{R^2}$$

$$\underline{R = R_p + h} = 2'47 \cdot 10^7 + 1'2 \cdot 10^6 = 2'59 \cdot 10^7 \text{ m}$$

$$v_{\text{SAT}} = \sqrt{G \frac{M_p}{R}} = \sqrt{6'67 \cdot 10^{-11} \cdot \frac{1 \cdot 10^{26}}{2'56 \cdot 10^7}} = 16110 \text{ m/s}$$

$$\frac{T_T^2}{R_T^3} = \frac{T_N^2}{R_N^3} \quad \frac{365^2}{(1'49 \cdot 10^{11})^3} = \frac{T_N^2}{(4'5 \cdot 10^{12})^3}$$

$$T = \sqrt{\frac{365^2 \cdot (4'5 \cdot 10^{12})^3}{(1'49 \cdot 10^{11})^3}} = \underline{60580 \text{ d}}$$

$$⑤ P = 65 N \rightarrow m = 66 \text{ Kg}$$



$$① E_{m_1} = E_{P_1} + E_{C_1} = mgh_1 = 66 \cdot 15 \cdot 9.81 = 9712 \text{ J}$$

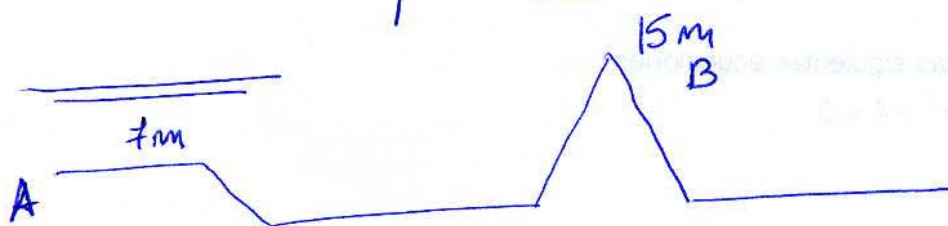
$$② E_{m_2} = E_{m_1} = 9712 \text{ J} = E_{P_2} + E_{C_2} = \frac{1}{2} m v_2^2$$

$$9712 \text{ J} = \frac{1}{2} 66 \cdot v_2^2 \rightarrow v_2 = \sqrt{\frac{2 \cdot 9712}{66}} = 17.15 \text{ m/s}$$

$$③ E_{m_3} = E_{m_1} = 9712 \text{ J} = E_{P_3} + E_{C_3} = mgh_3 + \frac{1}{2} m v_3^2$$

$$66 \cdot 9.81 \cdot 7 + \frac{1}{2} 66 \cdot v_3^2 = 9712 \quad 4532 + 33v_3^2 = 9712$$

$$v_3 = \sqrt{\frac{9712 - 4532}{33}} = 12.5 \text{ m/s}$$



$$E_{m_A} = E_{m_B}$$

$$E_{m_B} = 9712 \text{ J}$$

$$E_{m_A} = E_{P_A} + E_{C_A}$$

$$\rightarrow E_{C_A} \Rightarrow v_A = v_3$$

$$v_3 = 12.5 \text{ m/s}$$