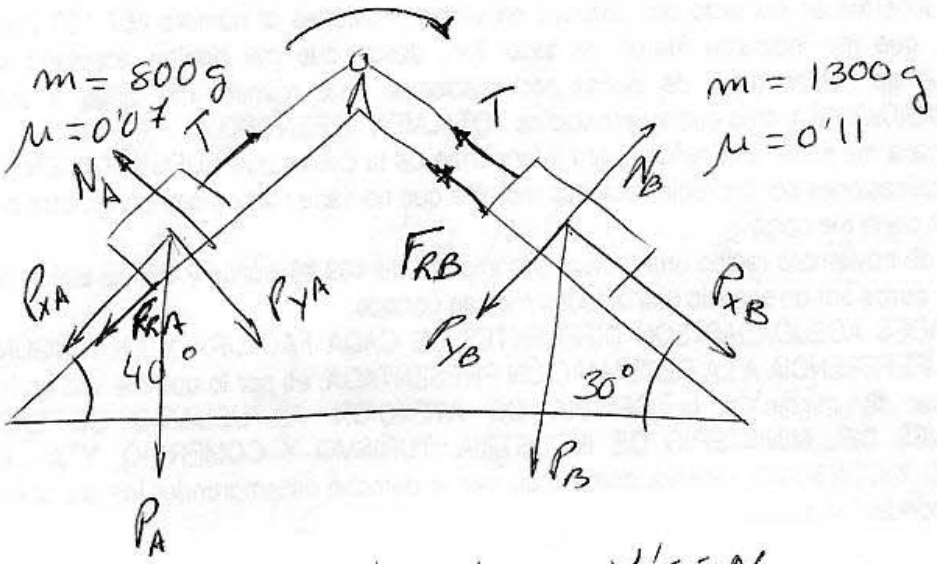
③ $P_{GAS} = P_{atm} + d\,g\,h$

$P_{GAS} = 101360 + 13600 \cdot 0'18 \cdot 9'81$

$P_{GAS} = 125375\ Pa \simeq \underline{1'2\ atm}$

④



Ⓐ $P_A = m_A \cdot g = 0'8 \cdot 9'81 = 7'85\ N$

$P_{XA} = P_A \cdot \operatorname{sen}\alpha = 7'85 \cdot \operatorname{sen} 40° = \underline{5'04\ N}$

$P_{YA} = P_A \cdot \cos\alpha = 7'85 \cdot \cos 40° = 6'01\ N \equiv N_A$

$F_{RA} = N_A \cdot \mu = 6'01 \cdot 0'07 = 0'42\ N$

$P_{XB} > P_{XA}$

Ⓑ $P_B = m_B \cdot g = 1'3 \cdot 9'81 = 12'75\ N$

$P_{XB} = P_B \cdot \operatorname{sen}\alpha = 12'75 \cdot \operatorname{sen} 30° = \underline{6'38\ N}$

$P_{YB} = P_B \cdot \cos\alpha = 12'75 \cdot \cos 30° = 11'04\ N \equiv N_B$

$F_{RB} = N_B \cdot \mu = 11'04 \cdot 0'11 = 1'21\ N$

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

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

$P_{XB} - F_{RB} - F_{RA} - P_{XA} = (m_A + m_B) \cdot a$

/ cont... $P_{xB} - F_{RB} - F_{RA} - P_{xA} = (m_A + m_B) \cdot a$

$6'38 - 1'21 - 0'42 - 5'04 = (0'8 + 1'3) \cdot a$

$-0'29 = 2'1 \cdot a$

No se mueve

(5) $M_T = 5'98 \cdot 10^{24}\ Kg \Rightarrow M_L = \frac{1}{81} \cdot M_T = 7'38 \cdot 10^{22} Kg$

$R_T = 6370\ Km = 6'37 \cdot 10^6\ m \Rightarrow R_L = \frac{1}{4} R_T = 1'593\ 10^6\ m$

$$F = G \cdot \frac{M_L \cdot m_P}{R_L^2} = 6'67 \cdot 10^{-11} \frac{7'38 \cdot 10^{22} \cdot 73}{(1'593 \cdot 10^6)^2} =$$

$$\boxed{F = 141'6\ N \simeq \text{Peso}}$$

$$g = G \frac{M_L}{R_L^2} = 6'67 \cdot 10^{-11} \cdot \frac{7'38 \cdot 10^{22}}{(1'593 \cdot 10^6)^2}$$

$$\boxed{g = 1'94\ m/s^2}$$

$$F = G \frac{M_L \cdot m_{SAT}}{(R_L + h)^2} = 6'67 \cdot 10^{-11} \cdot \frac{7'38 \cdot 10^{22} \cdot 450 Kg}{(1'593 \cdot 10^6 + 1'2 \cdot 10^6)^2} =$$

$$F = 284\ N$$

/ cont...

$$F_G = F_C$$

$$G \cdot \frac{M_L \cdot m_{SAT}}{(R_L+h)^2} = m_{SAT} \cdot \frac{v_{SAT}^2}{(R_L+h)}$$

$$v_{SAT} = \sqrt{G \cdot \frac{M_L}{(R_L+h)}} = \sqrt{6'67 \cdot 10^{-11} \cdot \frac{7'38 \cdot 10^{22}}{(1'593 \cdot 10^6 + 1'2 \cdot 10^6)}}$$

$$v_{SAT} = 1327'6 \ m/s$$

(6) $T_{Io} = 1'53 \cdot 10^5 s$ $\quad T_{Calixto} = 1'44 \cdot 10^6 s$

$R_{Io} = 4'22 \cdot 10^8 m$ $\quad R_{Calixto} = ?$

$$\frac{T_{Io}^2}{R_{Io}^3} = \frac{T_C^2}{R_C^3} \qquad \frac{(1'53 \cdot 10^5)^2}{(4'22 \cdot 10^8)^3} = \frac{(1'44 \cdot 10^6)^2}{R_C^3}$$

$$R_C = \sqrt[3]{\frac{(1'44 \cdot 10^6)^2 \cdot (4'22 \cdot 10^8)^3}{(1'53 \cdot 10^5)^2}} = \underline{1'8 \cdot 10^9 \ m}$$

$$v_{Io}^2 = G \cdot \frac{M_J}{d_{Io-J}} \qquad v_{Io} = \frac{2\pi r}{t} = \frac{2 \cdot \pi \cdot 4'22 \cdot 10^8}{1'53 \cdot 10^5} = 17330 \ m/s$$

$$M_J = \frac{v_{Io}^2 \cdot d_{Io-J}}{G} = \frac{17330^2 \cdot 4'22 \cdot 10^8}{6'67 \cdot 10^{-11}} = \underline{1'9 \cdot 10^{27} \ Kg}$$