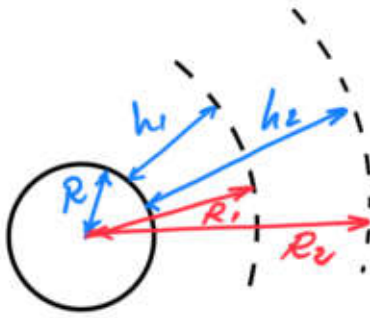


EJERCICIO F2BE2634:



$$G = 6,67 \cdot 10^{-11} \text{ N} \cdot \text{m}^2 \cdot \text{kg}^{-2}$$

$$R = 5700 \cdot 10^3 \text{ m}$$

$$h_1 = 4000 \cdot 10^3 \text{ m}$$

$$h_2 = 4250 \cdot 10^3 \text{ m}$$

a) $M_{\text{TACANDE}} = ?$; si $v_{\text{orbital}} = 11520 \frac{\text{km}}{\text{h}}$

$$11520 \frac{\text{km}}{\text{h}} \frac{1000 \text{ m}}{1 \text{ km}} \frac{1 \text{ hora}}{3600 \text{ s}} = 3200 \text{ m/s}$$

$$v_{\text{orbital}} = \sqrt{\frac{GM}{R_1}} = \sqrt{\frac{GM}{R+h_1}}$$

$$3200 = \sqrt{\frac{6,67 \cdot 10^{-11} \cdot M}{5,7 \cdot 10^6 + 4 \cdot 10^6}}$$

$$3200^2 = 6,67 \cdot 10^{-11} \cdot \frac{M}{9,7 \cdot 10^6}$$

$$M = 1,49 \cdot 10^{24} \text{ kg}$$

5) $T = ?$

$$v = \frac{s}{T} \Rightarrow 3200 = \frac{2\pi \cdot R_1}{T}$$

$$T = \frac{2\pi \cdot 9,7 \cdot 10^6}{3200} = 19045,91 \text{ s}$$

$$\frac{19045,91 \text{ s}}{3600} = 5,29 \text{ horas}$$

$$0,29 \text{ horas} \frac{60 \text{ minutos}}{1 \text{ hora}} = 17,4 \text{ minutos}$$

$$T = 5 \text{ horas}; 17,4 \text{ minutos}$$

c) ¿E para pasar de órbita 1 a órbita 2?

$$\begin{aligned}\Delta E &= E_2 - E_1 = -\frac{GMm}{2R_2} - \left(-\frac{GMm}{2R_1}\right) = \\ &= -\frac{6,67 \cdot 10^{-11} \cdot 1,49 \cdot 10^{24} \cdot 400}{2(R+h_2)} - \left(-\frac{6,67 \cdot 10^{-11} \cdot 1,49 \cdot 10^{24} \cdot 400}{2(R+h_1)}\right) = \\ &= -\frac{3,98 \cdot 10^{16}}{2(9,95 \cdot 10^6)} + \frac{3,98 \cdot 10^{16}}{2(9,7 \cdot 10^6)} = -2 \cdot 10^9 + 2,05 \cdot 10^9\end{aligned}$$

$$\boxed{\Delta E = 5,15 \cdot 10^7 \text{ J}}$$

d) $g_0 = ?$; $g_1 = ?$

$$g_0 = g_{\text{sup}} = G \frac{M}{R^2} = 6,67 \cdot 10^{-11} \frac{1,49 \cdot 10^{24}}{(5700 \cdot 10^3)^2}$$

$$\boxed{g_0 = 3,06 \frac{\text{N}}{\text{kg}}}$$

$$g_1 = G \frac{M}{R_1^2} = 6,67 \cdot 10^{-11} \frac{1,49 \cdot 10^{24}}{(9,7 \cdot 10^6)^2}$$

$$\boxed{g_1 = 1,06 \frac{\text{N}}{\text{kg}}}$$