

Lista 5

Correção

$$a) E_i = E_f$$
$$E_c^i + U_p^{g_i} = E_c^f + U_p^{g_f}$$

$$\frac{m v^2}{2} - \frac{G m M_T}{R_{Terra} + 200 \cdot 10^3} = E_c^f - \frac{G m M_T}{R_{Terra} + 1000 \cdot 10^3}$$

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

$$M_T = 5,98 \cdot 10^{24} \text{ kg}$$

$$v = 3700 \text{ m/s}$$

$$R_{Terra} = 6,37 \cdot 10^6 \text{ m}$$

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

$$\Rightarrow E_c^f = 3,83 \cdot 10^7 \text{ J}$$

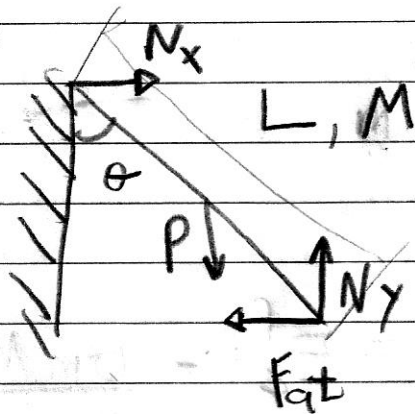
b)

$$E_i = E_f \quad \nearrow v=0$$
$$E_c^i + U_p^{g_i} = E_c^f + U_p^{g_f}$$

$$\frac{m v^2}{2} - \frac{G m M_T}{R_T + 200 \cdot 10^3} = - \frac{G m M_T}{R_T + d}$$

$$\Rightarrow d \approx 1039 \text{ km}$$

2)



$$\mu N_y = F_{at} = N_x$$

$$P = N_y$$

$$\sum \text{Momentos} = 0$$

$$N_x \cdot L \cdot \sin(90^\circ - \theta) - P \cdot \frac{L}{2} \sin \theta = 0$$

$$\underbrace{\mu N_y}_P \cdot L \cos \theta = P \cdot \frac{L}{2} \sin \theta$$

$$\Rightarrow \tan \theta = 2\mu \Rightarrow \theta = \arctan(2\mu)$$

$$0 < \theta \leq \arctan(2\mu)$$