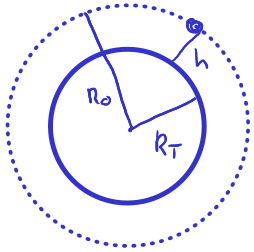


## Hasierako abiadura

Satelite batek Lurraren gainazaletik 230 km-ko altueran orbitatzen du. Kalkulatu:

- Mugitzen den abiadura.
- Orbita horretara iristeko airezko behar izan zuten abiadura.



### Datuak

$$h = 230 \cdot 10^3 \text{ m}$$

$$R_T = 6372 \cdot 10^3 \text{ m}$$

$$M_T = 5.97 \cdot 10^{24} \text{ kg}$$

$$R_o = R_T + h$$

$v_o$ ?

$v_i$ ?

### Ekuazioak

$$a) \quad -m \frac{v^2}{R} = \frac{-GM_T m}{R^2}$$

$$E_c = \frac{-E_p}{2}$$

$$b) \quad \Delta E = 0$$

$$E = \frac{1}{2} m v^2 - \frac{GM_T m}{R}$$

$$E = \frac{E_p}{2} = \frac{-GM_T m}{2R} \text{ (orbitan)}$$

$\rightarrow$

$\rightarrow$

### Ebazpena

$$v_o = \sqrt{\frac{GM_T}{R_o}} = 777 \text{ km/s} //$$

$$\left. \begin{aligned} E_g &= \frac{1}{2} m v_i^2 - \frac{GM_T m}{R_T} \\ E_o &= \frac{-GM_T m}{2 R_o} \end{aligned} \right\} E_o - E_g = 0$$

$$v_i^2 = 2GM_T \left( \frac{1}{R_T} - \frac{1}{2(R_T+h)} \right) \quad v_i = 864 \text{ km/s} //$$