A 1450 kg satellite orbits the Earth at an altitude of 7.2×10^5 m. Determine its total energy.

7.10×10^6 [

[O] 7.2×10^5 m

6.38×10^6 m
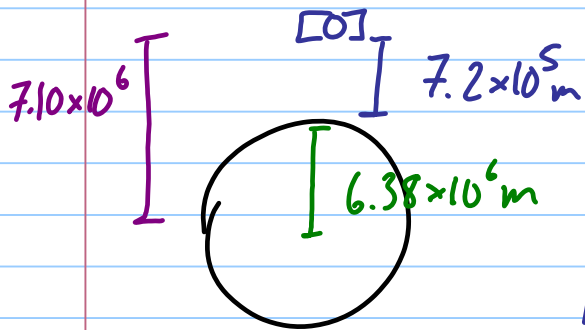
$$E_T = E_k + E_p$$

$$E_p = -\frac{Gm_1 m_2}{r}$$

$$= -\frac{(6.67 \times 10^{-11})(5.98 \times 10^{24})(1450)}{7.1 \times 10^6}$$

$$= -8.15 \times 10^{10} \text{ J} \checkmark$$

$a_c = g \checkmark$

$$\frac{v^2}{r} = \frac{Gm}{r^2}$$

$$v^2 = \frac{Gm}{r}$$

$$E_k = \frac{1}{2} mv^2 \checkmark$$

$$= \frac{1}{2} \frac{Gm_1 m_2}{r}$$

$$= \frac{1}{2}(-E_p)$$

$$E_T = E_p + E_k \checkmark$$

$$= E_p - \frac{1}{2} E_p$$

$$= \frac{1}{2} E_p \checkmark$$

$$\boxed{= -4.07 \times 10^{10} \text{ J}}$$