

Goldstern

1.12.

$$T_i + U_i = T_f + U_f$$

$$\frac{1}{2}mv_i^2 - \frac{GMm}{r} = \frac{1}{2}mv_f^2 = 0$$

$$\frac{1}{2}mv^2 = \frac{GMm}{r}$$

$$v = \sqrt{\frac{2GM}{r}}$$

$$= \sqrt{\frac{2 \times 6.67 \times 10^{-11} \frac{\text{m}^2}{\text{kg} \cdot \text{s}^2} \times 5.97 \times 10^{24} \text{ kg}}{6.37 \times 10^6 \text{ m}}}$$

$$= \sqrt{\frac{79.67 \times 10^{13} \frac{\text{m}^2}{\text{s}^2}}{6.37 \times 10^6 \text{ m}}}$$

$$= \sqrt{12.5 \times 10^7 \frac{\text{m}}{\text{s}^2}}$$

$$= \boxed{11.18 \times 10^3 \frac{\text{m}}{\text{s}}}$$