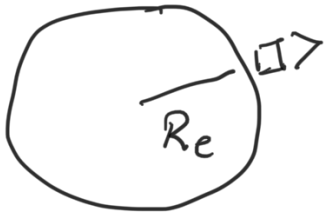
escape velocity



$$\frac{1}{2} m v^2 - \frac{G M_e m}{R_e} = 0$$

$$v^2 = 2 \frac{G M_e}{R_e}$$

$$g = 9.8 \, m/sec^2 = \frac{G M_e}{R_e^2}$$

$$\therefore \; g R_e = \frac{G M_e}{R_e}$$

$$V_{esc}^2 = 2 g R_e$$

$$\left(\frac{m}{sec}\right)^2 \qquad \frac{m}{sec^2} \; m$$

$$v^2 \approx 2 \cdot 10 \frac{m}{sec^2} \cdot 6 \cdot 10^6 \, m$$

$$\approx 10^8 \, m^2/sec^2$$

$v_{esc} \approx 10\ m/sec = 10\ km/sec$

$v_{sound} \approx 300\ m/sec$

$v_{esc} \approx 30 \cdot v_{sound}$
