

1B

$$d_A = d_B$$

$$g_p = \frac{G \cdot M_p}{r_p^2}$$

$$V = \frac{4}{3} \pi r^3$$

$$r_A = 3500 \text{ Km} = 3.5 \cdot 10^6 \text{ m}$$

$$d = \frac{m}{\text{Vol}} \rightarrow m = d \cdot \text{vol.}$$

$$r_B = 3000 \text{ Km} = 3 \cdot 10^6 \text{ m.}$$

$$m_A = d \cdot \frac{4}{3} \pi r_A^3$$

$$m_B = d \cdot \frac{4}{3} \pi r_B^3$$

a) Relaciones entre  $g_A$  y  $g_B$ 

b) Relaciones entre las velocidades de escape.

$$\left. \begin{aligned} g_A &= \frac{G \cdot M_A}{r_A^2} \\ g_B &= \frac{G \cdot M_B}{r_B^2} \end{aligned} \right\} \frac{g_A}{g_B} = \frac{\frac{G \cdot M_A}{r_A^2}}{\frac{G \cdot M_B}{r_B^2}} = \frac{G \cdot M_A \cdot r_B^2}{G \cdot M_B \cdot r_A^2}$$

$$\frac{g_A}{g_B} = \frac{d \cdot \frac{4}{3} \pi r_A^3 \cdot r_B^2}{d \cdot \frac{4}{3} \pi r_B^3 \cdot r_A^2} = \frac{r_A}{r_B} \rightarrow \text{lo que me da.}$$

b) Relación entre veloc. de escape.

$$v_e = \sqrt{2G \cdot M_p \cdot \frac{1}{r_p}} = \sqrt{2 \cdot g_p \cdot r_p^2 \cdot \frac{1}{r_p}} = \sqrt{2 \cdot g_p \cdot r_p}$$

$$g_p = \frac{G \cdot M_p}{r_p^2}$$

$$G \cdot M_p = g_p \cdot r_p^2$$

$$\frac{v_{eA}}{v_{eB}} = \sqrt{\frac{2 \cdot g_A \cdot r_A}{2 \cdot g_B \cdot r_B}} = \sqrt{\frac{r_A \cdot r_A}{r_B \cdot r_B}} = \sqrt{\frac{r_A^2}{r_B^2}} \rightarrow \text{lo que da.}$$

$$\frac{g_A}{g_B} = \frac{r_A}{r_B}$$