

$$4) F_{gab} = \frac{1}{2} n m_0 v_{\text{rms}}^2 = 49 \text{ kH} \rightarrow \Delta F_{\text{mem}} = 49 \text{ kH}$$

Ответ: $F_{\text{mem}} = 49 \text{ kH}$.

N4

$$1) g_1 = \frac{GM_m}{R^2}$$

$$g_2 = \frac{GM_m}{(R+h)^2}$$

$dA = m dg$ (m - масса элемента)

$$A = \int_{g_1}^{g_2} m g h = m (g_2 - g_1) h = GM_m m \left(\frac{1}{(R+h)^2} - \frac{1}{R^2} \right) h \quad h = R = 3430 \text{ km}$$

$$A_{\text{mg}} + GM_m m \left(\frac{1}{4R^2} - \frac{1}{R^2} \right) R = -\frac{3}{4} \frac{GM_m m R}{R^2} = -A_1 \rightarrow A_1 = \frac{3}{4} \frac{GM_m m}{R^2}$$

$$2) A_2 = \Delta E_k = E_{k2} - E_{k1} = \frac{m v^2}{2} - 0 = \frac{m v^2}{2}$$

$$g_2 = \frac{v^2}{R+h} = \frac{v^2}{2R} \rightarrow v^2 = 2g_2 R$$

$$A_2 = \frac{GM_m m}{2 \cdot 4R^2} \cdot 2R = \frac{GM_m m}{4R}$$

$$3) \frac{A_1}{A_2} = \frac{3GM_m m \cdot 4R}{4R \cdot GM_m m} = 3$$

Ответ: $\frac{A_1}{A_2} = 3$

N5.

$$S = 54.6 \text{ млн км}^2$$

$$v = 12 \text{ км/с}$$

$$t = \frac{S}{v} = \frac{54.6 \cdot 10^6 \text{ км}}{12 \text{ км/с}} = 4550000 \text{ с} = 52.7 \text{ qu.}$$

Ответ: 52.7 qu.