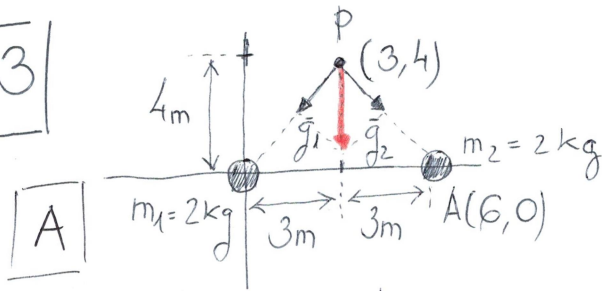


3



$$\vec{u}_1 = \frac{3\vec{i} + 4\vec{j}}{5} = \frac{3}{5}\vec{i} + \frac{4}{5}\vec{j}$$

$$\vec{g}_1 = -G \cdot \frac{m_1}{r_1^2} \cdot \vec{u}_1 = -6,67 \cdot 10^{-11} \cdot \frac{2}{25} \cdot \left( \frac{3}{5}\vec{i} + \frac{4}{5}\vec{j} \right)$$

$$\vec{g}_1 = -3,2 \cdot 10^{-12} \vec{i} - 4,27 \cdot 10^{-12} \vec{j} \quad \text{N/Kg}$$

$$\vec{u}_2 = \frac{-3\vec{i} + 4\vec{j}}{5} = -\frac{3}{5}\vec{i} + \frac{4}{5}\vec{j}$$

$$\vec{g}_2 = -G \cdot \frac{m_2}{r_2^2} \cdot \vec{u}_2 = -6,67 \cdot 10^{-11} \cdot \frac{2}{25} \cdot \left( -\frac{3}{5}\vec{i} + \frac{4}{5}\vec{j} \right)$$

$$\vec{g}_2 = 3,2 \cdot 10^{-12} \vec{i} - 4,27 \cdot 10^{-12} \vec{j} \quad \text{N/Kg}$$

$$\vec{g} = \vec{g}_1 + \vec{g}_2 \Rightarrow \boxed{\vec{g} = -8,54 \cdot 10^{-12} \vec{j} \quad \text{N/Kg}}$$

$$\vec{g} = \frac{\vec{F}}{m} \Rightarrow \vec{F} = m \cdot \vec{g}$$

$$\vec{F} = 3 \cdot (-8,54 \cdot 10^{-12} \vec{j}) \Rightarrow \boxed{\vec{F} = -2,56 \cdot 10^{-11} \text{ N}}$$

$$\boxed{4} \quad m = 2.500 \text{ kg} \\ h = 5.000 \text{ km}$$

$$\boxed{A} \quad |\vec{F}_g| = |\vec{F}_c|$$

$$G \cdot \frac{M_T \cdot m}{(R_T + h)^2} = m \cdot \frac{v^2}{(R_T + h)}$$

$$v = \sqrt{G \cdot \frac{M_T}{R_T + h}}$$

$$v = \sqrt{6,67 \cdot 10^{-11} \cdot \frac{5,98 \cdot 10^{24}}{11,37 \cdot 10^6}}$$

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$$v = 5.922,88 \frac{\text{m}}{\text{s}}$$

$\boxed{B}$

$$E_m(i) = E_m(f)$$

$$\frac{1}{2} m \cdot v_i^2 - G \cdot \frac{M_T \cdot m}{R_T} = \frac{1}{2} m \cdot v_f^2 - G \cdot \frac{M_T \cdot m}{(R_T + h)}$$

$$\frac{1}{2} v_i^2 = \frac{1}{2} \cdot v_f^2 + G \cdot M_T \cdot \left( \frac{1}{R_T} - \frac{1}{R_T + h} \right)$$

$$\frac{1}{2} \cdot v_i^2 = \frac{1}{2} \cdot (5.922,88)^2 + 6,67 \cdot 10^{-11} \cdot 5,98 \cdot 10^{24} \cdot \left( \frac{1}{6,37 \cdot 10^6} - \frac{1}{11,37 \cdot 10^6} \right)$$

$$v_i = 9.494,84 \frac{\text{m}}{\text{s}}$$

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DE  
LANZAMIENTO