

$$1) a) R_{23} = \left(\frac{1}{R_2} + \frac{1}{R_3} \right)^{-1} = 8,235 \Omega \quad 5$$

$$R_N = R_1 + R_{23} + R_1 = 20,2 \Omega \quad 5$$

$$b) I = 0,85 A$$

$$U = R \cdot I = R_N \cdot I = 17,2 V \quad 5$$

$$c) \left. \begin{aligned} U_{23} &= U_2 = U_3 \\ U &= R_{23} \cdot I = 7 V \quad I_2 = \frac{U_2}{R_2} = 0,5 A \end{aligned} \right\} 5$$

$$P_2 = I_2 U_2 = \frac{U_2^2}{R_2} = I_2^2 R_2 = 3,5 W \quad 5$$

$$2) a) \Delta W = 0 \quad \Delta G = 0 \quad \leftarrow 5 \text{ ali } \downarrow 5$$

$$v_1' = \frac{m_1 - m_2}{m_1 + m_2} v_1 + \frac{2m_2}{m_1 + m_2} v_2 = \ominus 6,43 \frac{m}{s} \quad 5$$

$$v_2' = \frac{m_2 - m_1}{m_1 + m_2} v_2 + \frac{2m_1}{m_1 + m_2} v_1 = 8,57 \frac{m}{s} \quad 5$$

$$b) \Delta G = 0$$

$$m_1 v_1 = (m_1 + m_2) v \quad 5$$

$$v = \frac{m_1}{m_1 + m_2} v_1 = 4,3 \frac{m}{s} \quad 5$$

3)

a) $\Delta W_p = \Delta W_{kin}$

$$mg \Delta h = \frac{mv^2}{2} \quad 2$$

$$\Delta h = H - h = 20 \text{ m} !$$

$$v = \sqrt{2g \Delta h} = \frac{20 \frac{\text{m}}{\text{s}}}{19,8 \frac{\text{m}}{\text{s}}} \quad 3$$

b)

$$x(t) = 0 + v \cdot \cos \varphi \cdot t \quad 2$$

$$y(t) = h + v \sin \varphi t - \frac{gt^2}{2} \quad 2$$

$$y(T) = 0 \quad \text{kvadratna enačba}$$

$$T_{1,2} = \frac{\frac{2v}{g} \sin \varphi \pm \sqrt{\frac{2^2 v^2 \sin^2 \varphi}{g^2} + 4 \frac{2h}{g}}}{2} \quad 2$$

$$T_1 = 2,5 \text{ s} \quad 2$$

$$T_2 = -0,8 \text{ s}$$

$$x(T_1) = D_b = 45,3 \text{ m} \quad 2$$

c)

$$\frac{mv^2}{2} = mg \Delta h + eU \quad 3$$

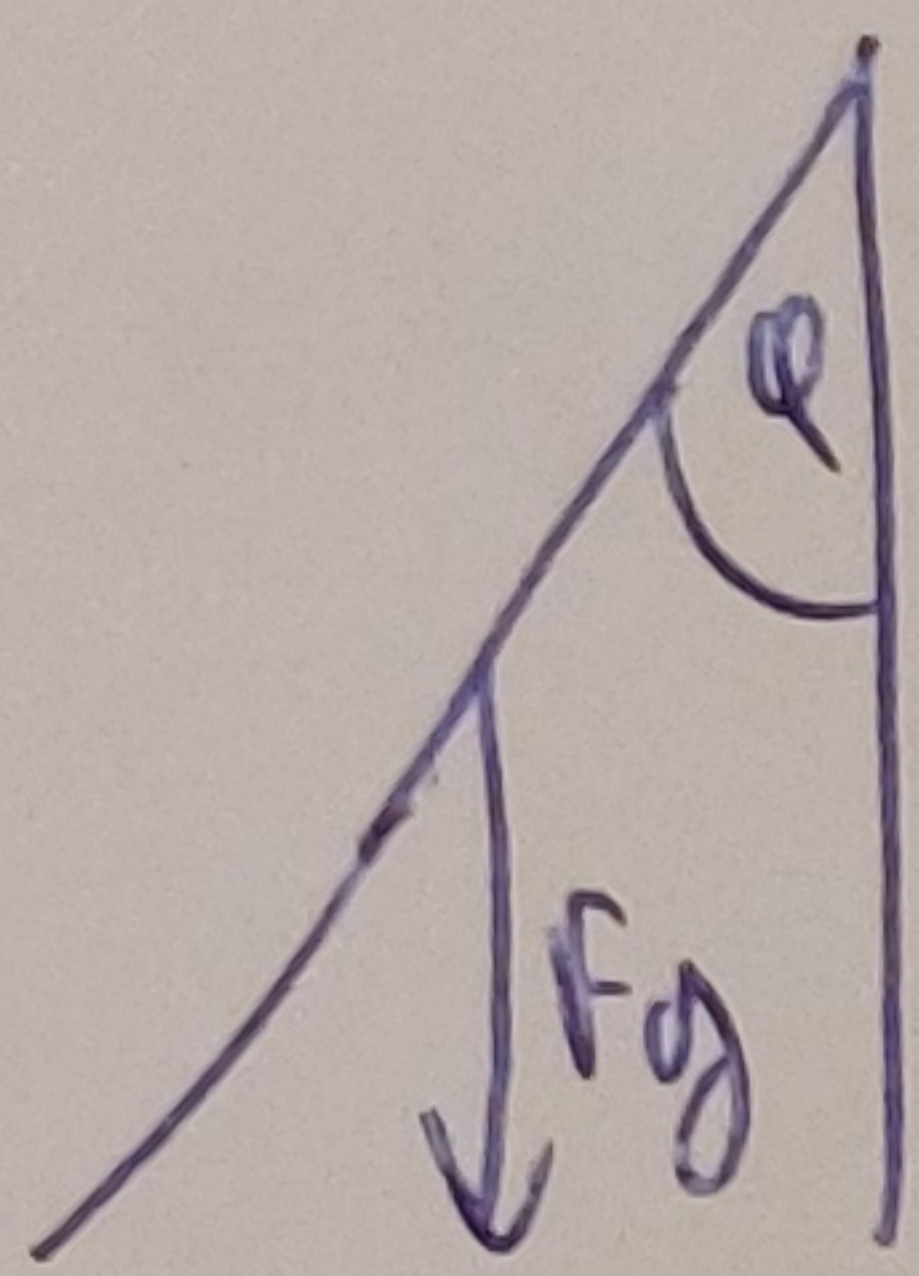
$$v = \sqrt{2g \Delta h + 2 \frac{e}{m} U} = 42,76 \frac{\text{m}}{\text{s}} \quad 2$$

enak postopek kot b) za $T_{1,2}, D_c$

$$T_1 = 4,1 \text{ s} \quad 2$$

$$D_c = 759 \text{ m} \quad 3$$

4)



$$\vec{M}_g = \vec{r} \times \vec{F}_g \quad 2 \quad \text{smer } \odot$$

$$M_g = \frac{l}{2} \cdot m \cdot g \cdot \sin \varphi \quad 3$$

$$p_m = S \cdot I \cdot N = 2,5 \text{ A m}^2 \quad 5$$

$$\vec{M}_{pm} = \vec{p}_m \times \vec{B} \quad 2 \quad \angle \vec{p}_m \leftarrow \vec{B} \quad \vec{M}_{pm}: \otimes$$

$$M_{pm} = p_m \cdot B \cdot \sin(90^\circ - \varphi) \quad 3$$

$$M_g = M_{pm} \quad 5$$

$$m g \frac{l}{2} \sin \varphi = p_m B \cos \varphi \quad 2$$

$$\tan \varphi = \frac{p_m B}{m g \frac{l}{2}} = 0,1818 \quad 1$$

$$\varphi = 70,3^\circ \quad 1 \quad \text{v levo, kot na sliki.} \quad 1$$

5)

$$\Delta W_G = \Delta W_k = \frac{m_F v^2}{2}$$

$$W_{Gz} = -G M_F \int \frac{dm_A}{r} \quad 5$$

$$= -G M_F M_A \int_{x_0}^{x_0+a} \frac{dx}{x} \quad 5$$

$$x_0 = 2 \text{ m}$$

$$a = 2 \text{ m}$$

$$= -G M_F M_A \ln\left(\frac{x_0+a}{x_0}\right) \quad 5$$

$$W_{Gk} = -G M_F M_A \ln\left(\frac{x_1+a}{x_1}\right) \quad x_1 = 5 \text{ cm} = d \quad 5$$

$$\frac{m_F v^2}{2} = W_{Gk} - W_{Gz} = 5,7 \cdot 10^{-8} \text{ J} \quad 5$$

$$v = 2,26 \cdot 10^{-4} \frac{\text{m}}{\text{s}} \quad 5$$