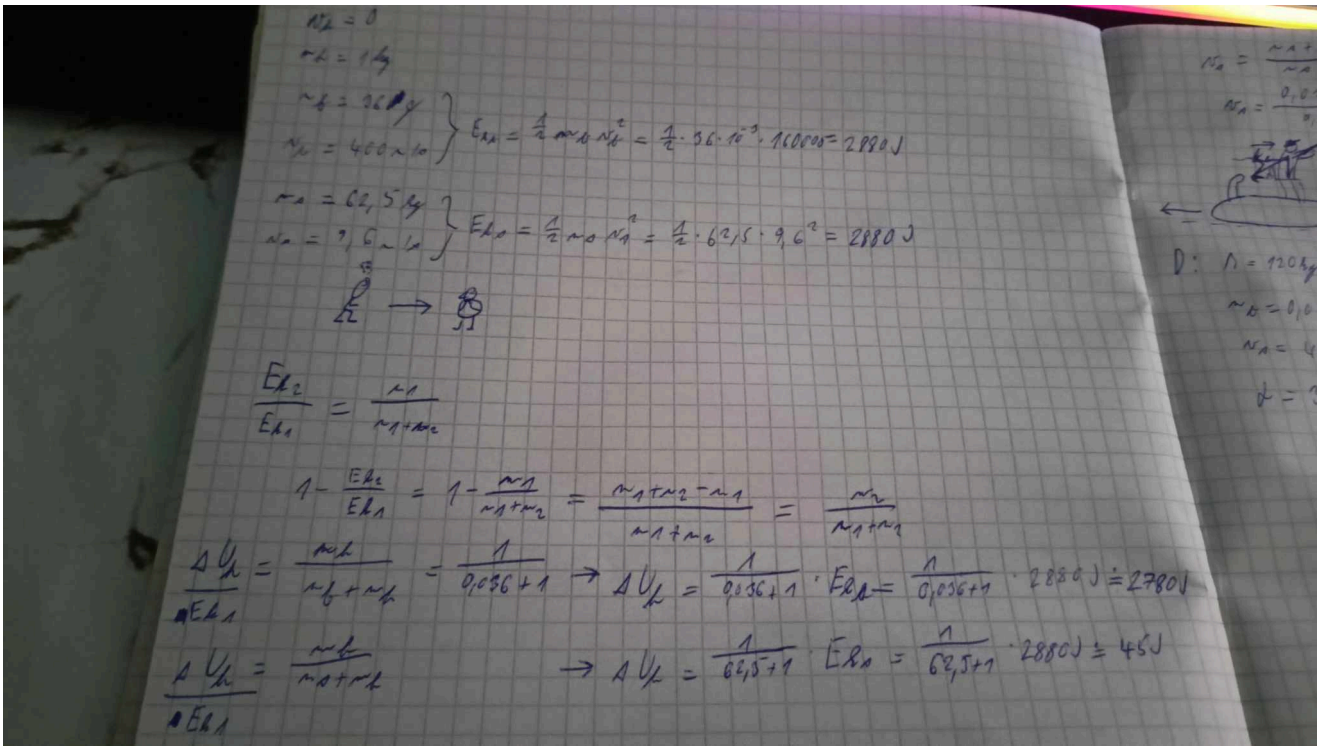
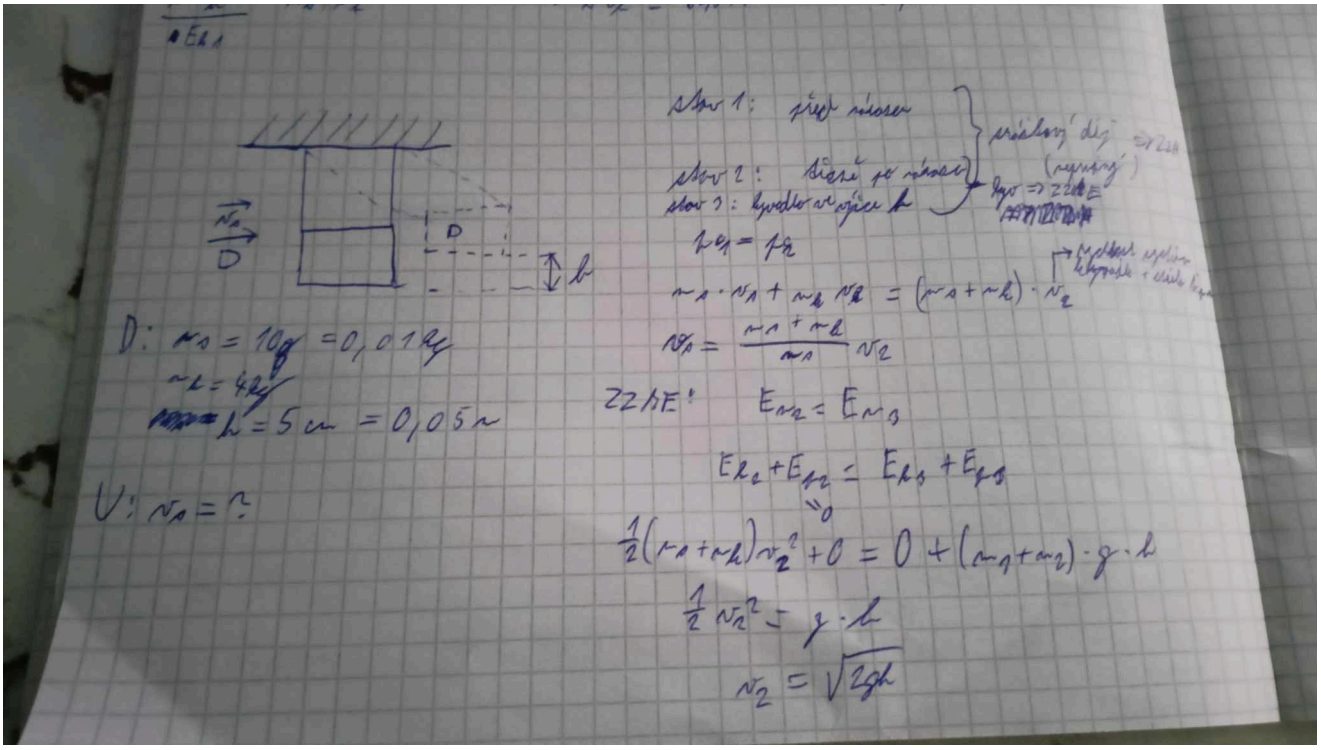
F7 - Příklady na mechaniku





$$v_0 = \frac{m_A + m_k}{m_0} \cdot \sqrt{2gh}$$

$$v_A = \frac{0{,}01 + k}{0{,}01} \cdot \sqrt{2 \cdot \frac{m}{s^2} \cdot 0{,}05} = 397\ m/s$$

D: $M = 120\,kg$

$m_k = 0{,}010\,kg$

$v_A = 400\ m/s$

$\alpha = 30°$

ZZH: $\vec{p_1} + \vec{p_2} = 0$

$p_0 = p_k$

$\vec{p_1} = -\vec{p_2}$

$\vec{p_{2\parallel}} = p_2 \cdot \cos\alpha$

$p_{2\perp} = p_2 \cdot \sin\alpha$

$p_{1\parallel} = p_1 \cdot \cos\alpha$

$p_{1\perp} = p_1 \cdot \sin\alpha$

$$\begin{bmatrix} p_{1\parallel} \\ p_{1\perp} \end{bmatrix} = -\begin{bmatrix} p_{2\parallel} \\ p_{2\perp} \end{bmatrix}$$

$p_{2\parallel} = -p_{1\parallel}$

$M \cdot v_{\parallel} = -p_1 \cdot \cos\alpha$

$M \cdot v_{\parallel} = -m_k \cdot v_k \cdot \cos\alpha$

$v_{\parallel} = -\frac{m_k}{M} \cdot v_k \cdot \cos\alpha$

$v_{\parallel} = -\frac{0{,}03}{120} \cdot 400 \cdot \cos 30$

$v_{\parallel} = -\frac{120}{120} \cdot \cos 30 = -\frac{\sqrt{3}}{2} \approx 0{,}87\ m/s$

$\dot{=} 2780\,J$

$\dot{=} 45\,J$