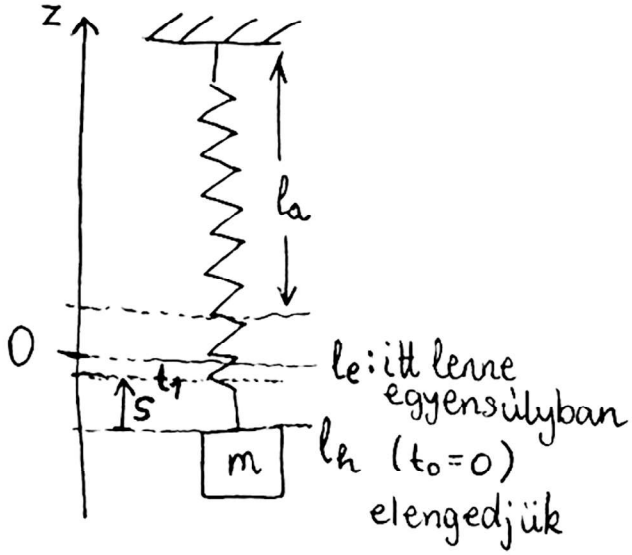
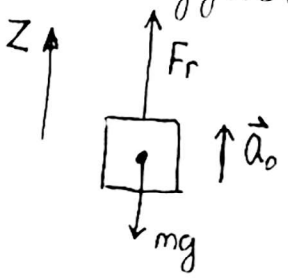
5.) $l_a = 0{,}5\,m$ $D = 100\,N/m$ $m = 0{,}5\,kg$ $l_k = 0{,}7\,m$ $s = 10\,cm$

$a_0 = ?$ $v = ?$

$F_r = D \cdot \Delta l$ $\quad \vec{a} = \frac{\vec{F_e}}{m}$ $\quad E_{M1} = E_{M2}$ $\quad E_{pg} = mgh$ $\quad E_{pr} = \frac{1}{2} D \Delta l^2$



- Kezdeti gyorsulás: a_0



$m\vec{a} = \vec{F_e}$

(z) $ma_0 = F_r - mg$

$ma_0 = D(l_k - l_a) - mg$

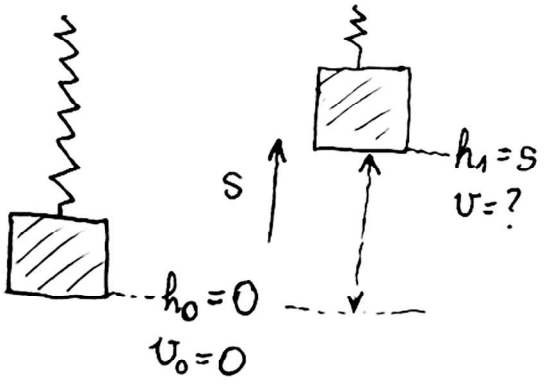
$\Downarrow$

$\underline{\underline{a_0}}$

- Sebesség $s = 10\,cm$ út után

Csak konzervatív erők hatnak: rugó és gravitáció

Mechanikai energia megmarad



$$E_M(t_0) = E_M(t_1)$$

$$E_k(t_0) + E_{pg}(t_0) + E_{pr}(t_0) = E_{pg}(t_1) + E_{pr}(t_1) + E_k(t_1)$$

Tehát:

$$0 + mg \cdot 0 + \frac{1}{2} D (l_k - l_a)^2 = mg \cdot s + \frac{1}{2} D (l_k - s - l_a)^2 + \frac{1}{2} m v^2$$

$\Downarrow$

$\underline{\underline{v}}$