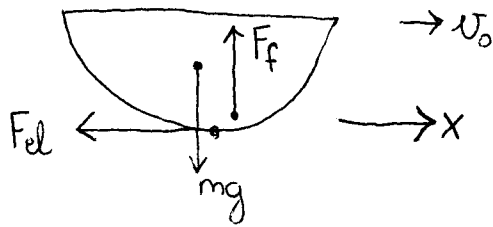


11.) $v_0 = 6 \frac{m}{s}$ $t = 69s$ $v_1 = 3 \frac{m}{s}$ $F_{el} = b v$ $b = ?$



$x(t) = ?$

$$\vec{a} = \frac{d\vec{v}}{dt}$$

$$\vec{a} = \frac{\vec{F}_e}{m}$$

$$\vec{v} = \frac{d\vec{r}}{dt}$$

(y) $F_f = mg$ $(x) -b v = m a$
 $a_y = 0$

$$-b v = m \frac{dv}{dt} \rightarrow -\frac{b}{m} dt = \frac{dv}{v}$$

$$\int_{v_0}^v \frac{dv}{v} = -\frac{b}{m} \int_0^t dt$$

$$[\ln v]_{v_0}^v = -\frac{b}{m} [t]_0^t \rightarrow \ln v - \ln v_0 = -\frac{b}{m} t$$

$$\ln \frac{v}{v_0} = -\frac{b}{m} t \rightarrow \frac{b}{m} = -\frac{\ln \frac{3}{6}}{69s} = 0,015$$

$$\frac{v}{v_0} = e^{-\frac{b}{m} t} \rightarrow v = v_0 e^{-\frac{b}{m} t}$$

$$\frac{dx}{dt} = v_0 e^{-\frac{b}{m} t} \rightarrow dx = v_0 e^{-\frac{b}{m} t} dt$$

$$\int_0^x dx = v_0 \int_0^t e^{-\frac{b}{m} t} dt$$

$$x = -\frac{m v_0}{b} \left[e^{-\frac{b}{m} t} \right]_0^t = -\frac{m v_0}{b} (e^{-\frac{b}{m} t} - 1)$$

$$x(t) = \frac{m v_0}{b} (1 - e^{-\frac{b}{m} t}) = 600 (1 - e^{-0,01 t})$$