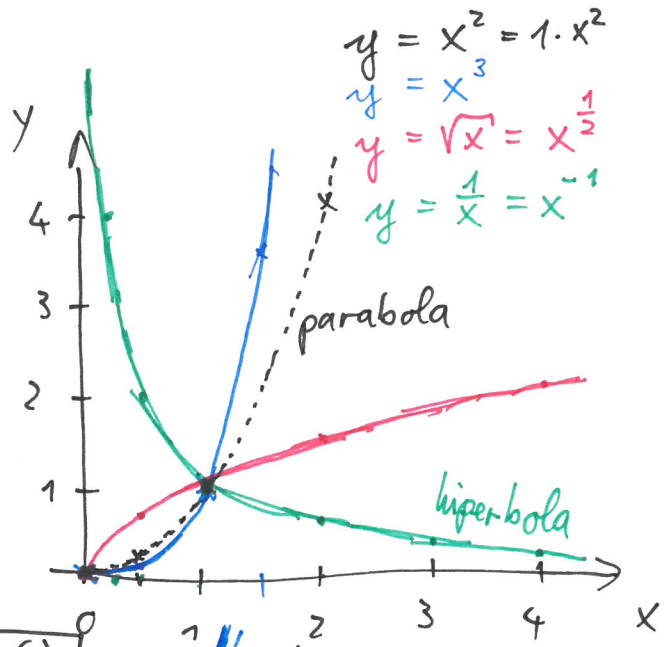
$A \sim a^2$ $\quad (A = 6a^2)$

$V \sim a^3$ $\quad (V = a^3)$

$$y = b \cdot x^a$$



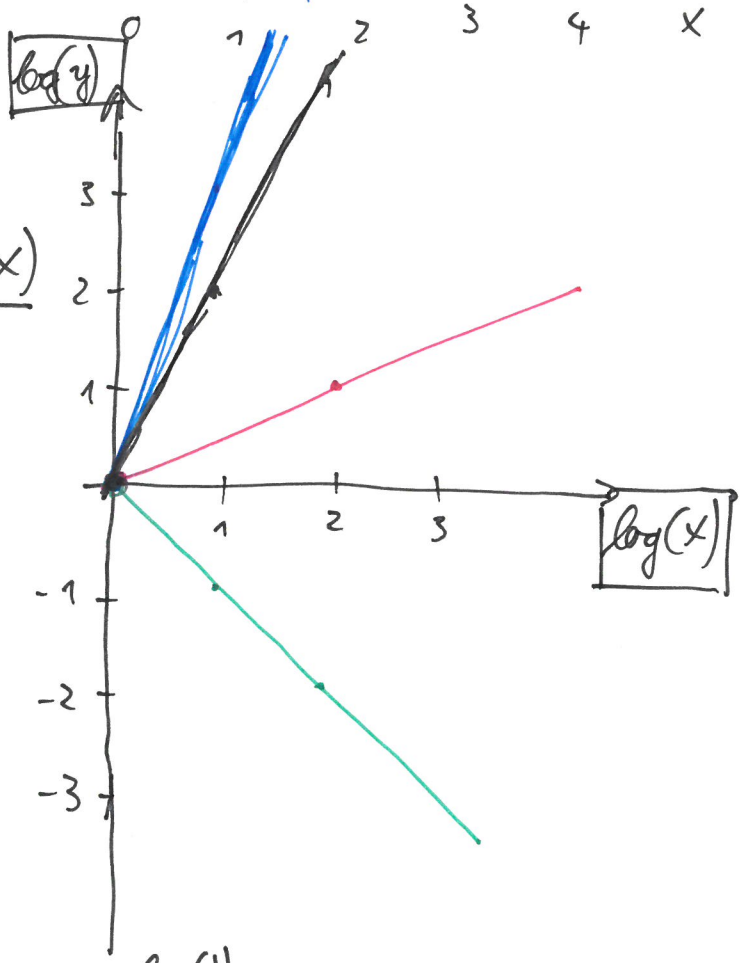
linearizáció

$$\log(y) = \log(b \cdot x^a)$$

$$= \log(b) + \log(x^a)$$

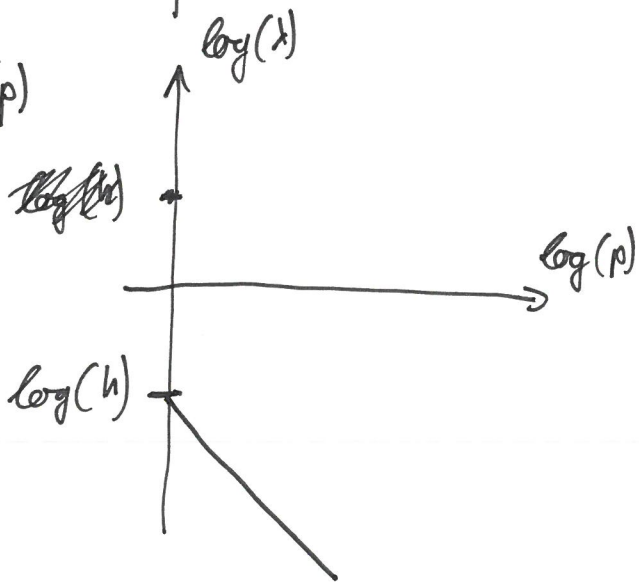
$$\log(y) = \log(b) + a \cdot \log(x)$$

$$y = b + a \cdot x$$



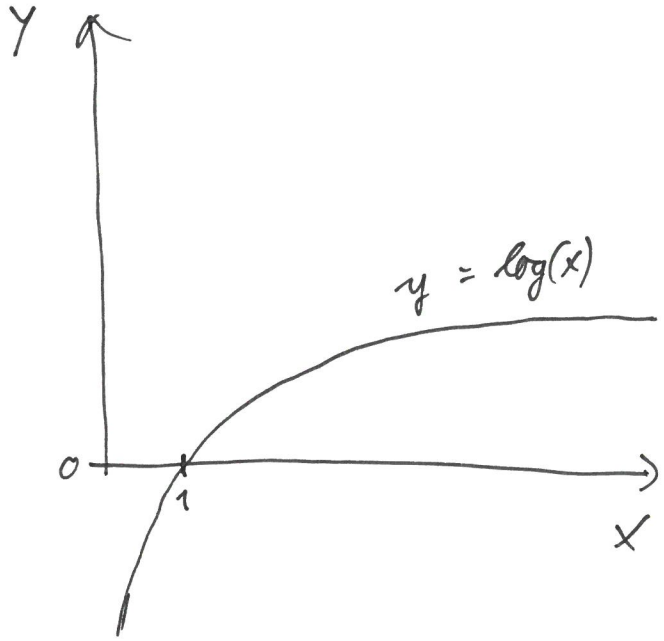
$$\lambda = \frac{h}{p} = h \cdot \frac{1}{p} = h \cdot p^{-1}$$

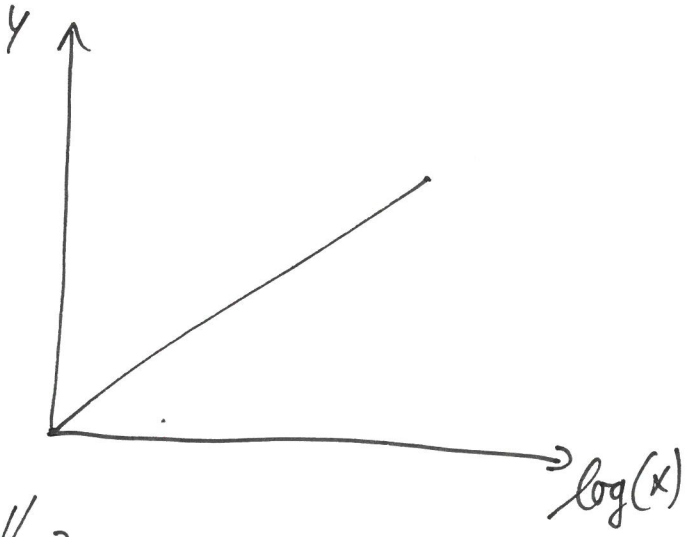
$$\log(\lambda) = \log(h) + (-1) \cdot \log(p)$$



$y = b \cdot \log_a(x)$

linearizálás:





1. g) $\frac{1}{2} m \cdot v^2 = \frac{3}{2} k T$ // $\cdot 2$

$m \cdot v^2 = 3 k \cdot T$ // $\div (3k)$

$\frac{m \cdot v^2}{3 \cdot k} = T$

2. e) $\frac{1}{2} m \cdot v^2 = \frac{3}{2} k T$ // $\cdot 2$

$m v^2 = 3 k T$ // $\div m$

$v^2 = \frac{3 k T}{m}$ // $\sqrt{\ }$

$v = \sqrt{\frac{3 k T}{m}}$

4. a)

$$I = I_0 \cdot e^{-\mu \cdot x} \qquad /\!/ \div I_0$$

$$\frac{I}{I_0} = e^{-\mu \cdot x} \qquad /\!/ \ln(\,)$$

$$\ln\left(\frac{I}{I_0}\right) = \ln\left(e^{-\mu \cdot x}\right) = -\mu \cdot x \cdot \underbrace{\ln(e)}_{1} = -\mu \cdot x \qquad /\!/ \div(-\mu)$$

$$\frac{\ln\left(\frac{I}{I_0}\right)}{-\mu} = x$$

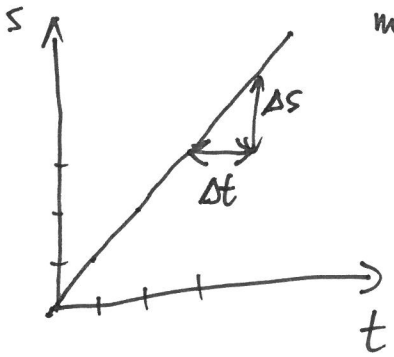
$$\ln\left(\frac{I}{I_0}\right) = \ln\left(\left(\frac{I_0}{I}\right)^{-1}\right) = -1 \cdot \ln\left(\frac{I_0}{I}\right)$$

$$\frac{\ln\left(\frac{I_0}{I}\right)}{\mu} = x$$

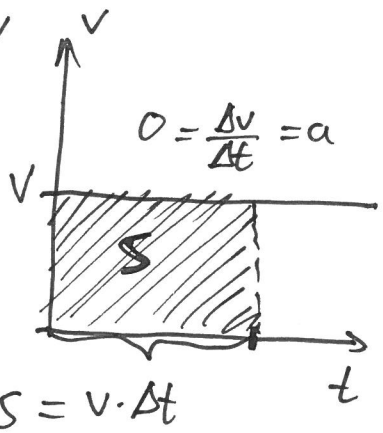
---

egyenes vonalú mozgások.

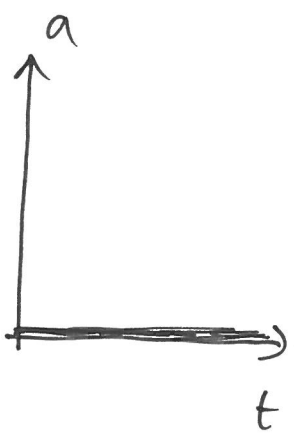
① egyenletes mozgás: $v = \text{konst.}$



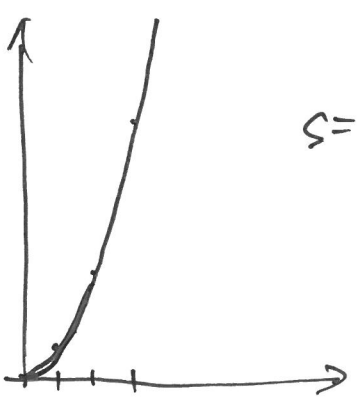
meredekség: $\frac{\Delta s}{\Delta t} = v$



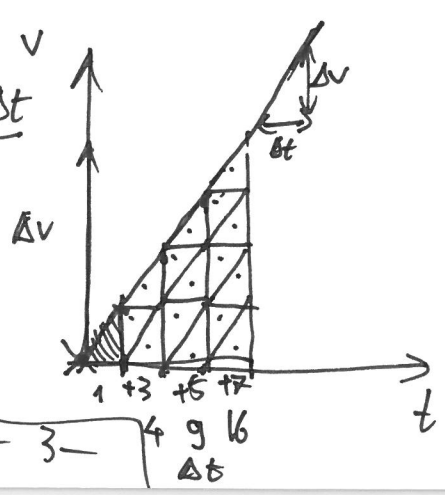
$s = v \cdot \Delta t$

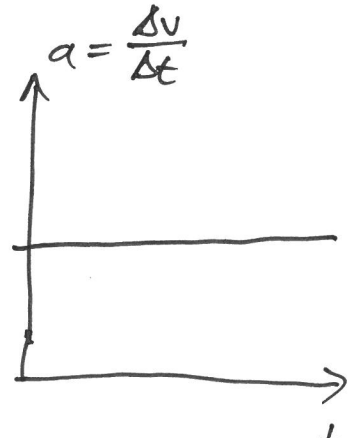


② egyenletes gyorsulás: $a = \text{konst.}$

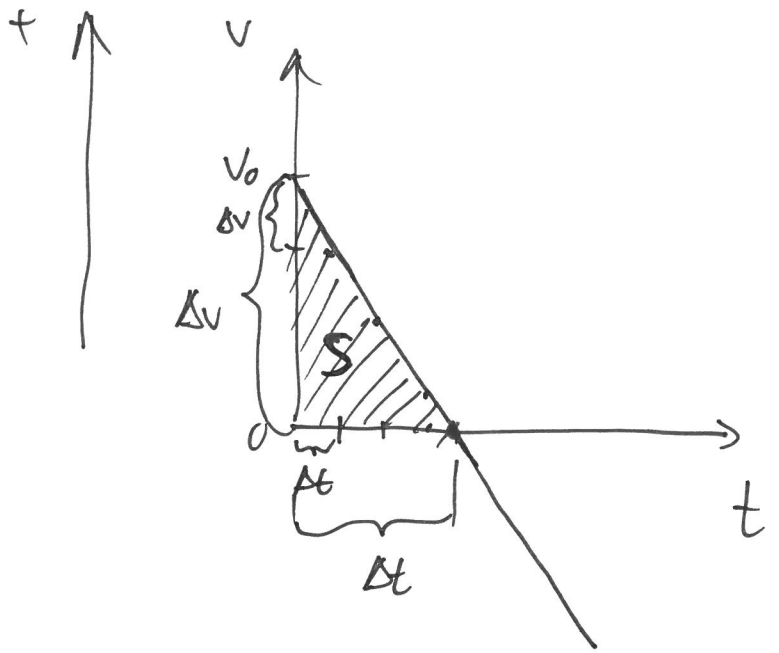


$s = \frac{\Delta v \cdot \Delta t}{2}$





3/5 $a = \text{konst} < 0$



3/7 $v_0 = 36 \frac{km}{h} = 36 \frac{1000\ m}{3600\ s} = 10 \frac{m}{s}$

a) $|\Delta v| = v_0$

$a = g = \frac{\Delta v}{\Delta t}$

$\Delta t = \frac{\Delta v}{g} = \frac{10 \frac{m}{s}}{10 \frac{m}{s^2}} \cong 1\ s$

$g \cdot \Delta t = \Delta v$

$\Delta t = \frac{\Delta v}{g}$

$\frac{\left(\frac{m}{s}\right)}{\left(\frac{m}{s^2}\right)} = \frac{m}{s} \cdot \frac{s^2}{m} = s$

b) $s = \frac{\Delta v \cdot \Delta t}{2} = \frac{10 \frac{m}{s} \cdot 1 s}{2} = 5\ m$

$v_2 - v_1 = \Delta v$

$\frac{\Delta v}{v} = \frac{v \cdot \Delta t}{r}$

$\Delta v = \frac{v^2 \cdot \Delta t}{r}$

$a_\varphi = \frac{\Delta v}{\Delta t} = \frac{v^2}{r}$ $\qquad \frac{\left(\frac{m}{s}\right)^2}{m} = \frac{m}{s^2}$

3/9 $r = 8\,m$

$\Delta t = 3{,}5\ min = 210\ s$

$N = 20$

a) $T = \frac{\Delta t}{N} = \frac{210\,s}{20} = 10{,}5\ s$

b) $f = \frac{1}{T} = \frac{1}{10{,}5\,s} = \frac{20}{210\,s} = 0{,}0952\ \frac{1}{s} = 0{,}0952\ Hz$

c) $\omega = \frac{\Delta \varphi}{\Delta t} = \frac{2\pi\ rad}{T} = \frac{2\pi\ rad}{10{,}5\,s} = 0{,}598\ \frac{rad}{s}$

$= 0{,}598\ \frac{1}{s}$

d) $v = \omega \cdot r = 0{,}598\ \frac{1}{s} \cdot 8\,m = 4{,}787\ \frac{m}{s}$