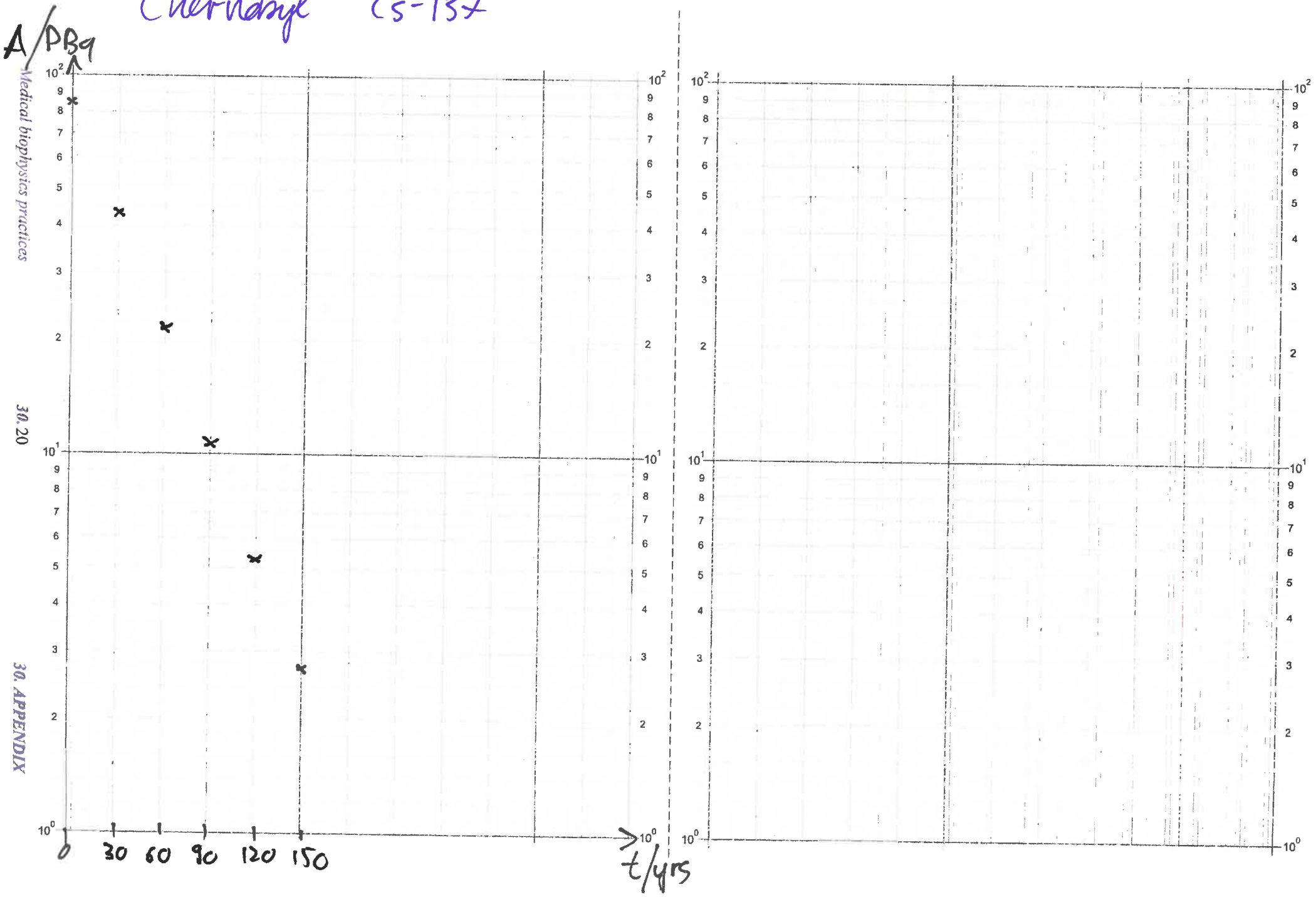
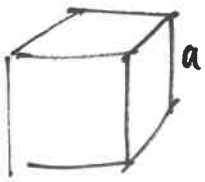
Chernobyl Cs-137





$A = 6 \cdot a^2$

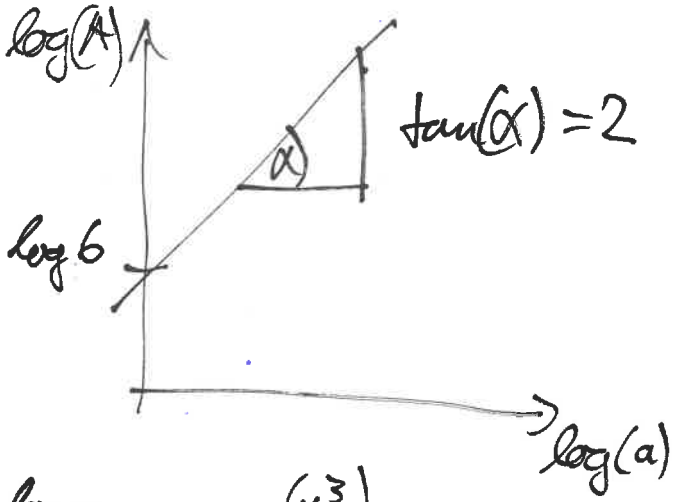
$V = a^3$

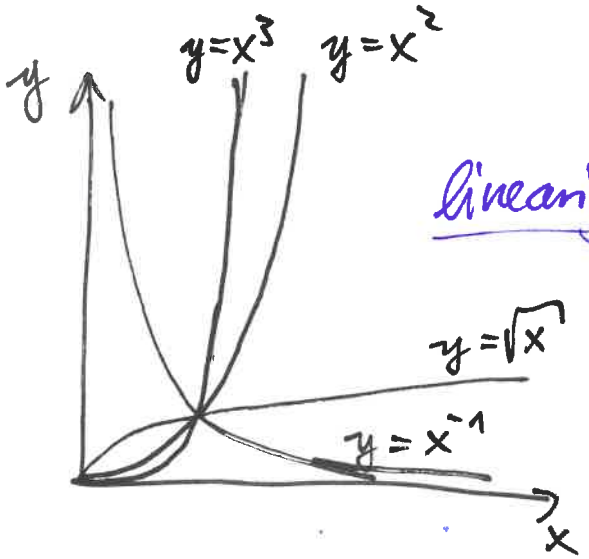
linearizáció

intercept

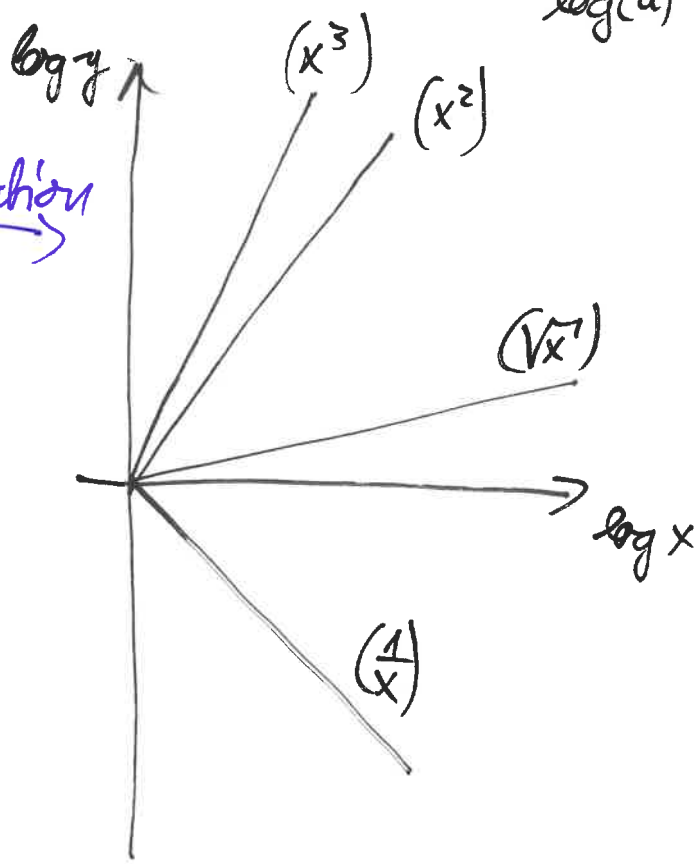
slope

$\log(A) = \log 6 + 2 \cdot \log(a)$





linearizáció



Rectilinear motions

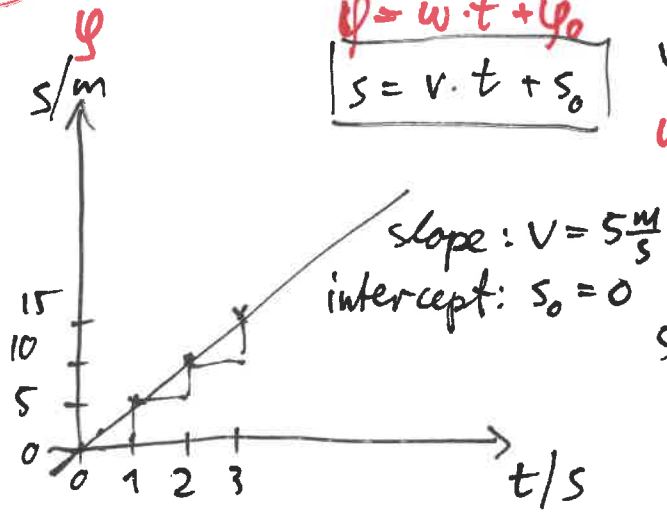
① Uniform motion : constant velocity $v = \frac{\Delta s}{\Delta t}$ $[v] = \frac{[\Delta s]}{[\Delta t]} = \frac{m}{s}$

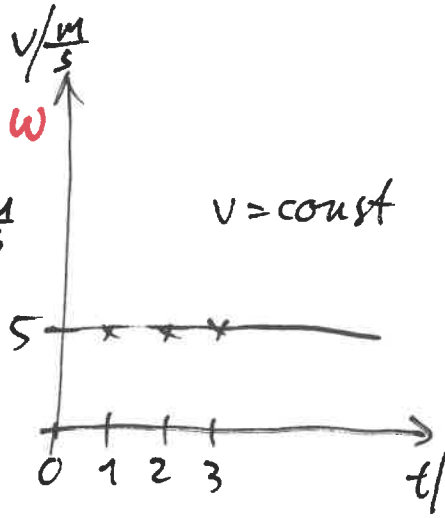
e.g. $v = 5\frac{m}{s}$ $a = \frac{\Delta v}{\Delta t}$ $[a] = \frac{m}{s^2}$

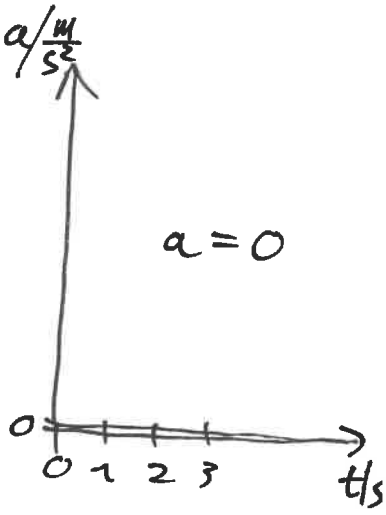
1b Uniform circular motion

$\varphi = \omega \cdot t + \varphi_0$

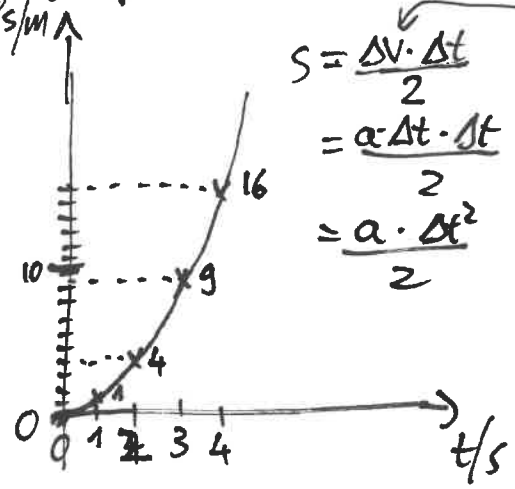
$s = v \cdot t + s_0$







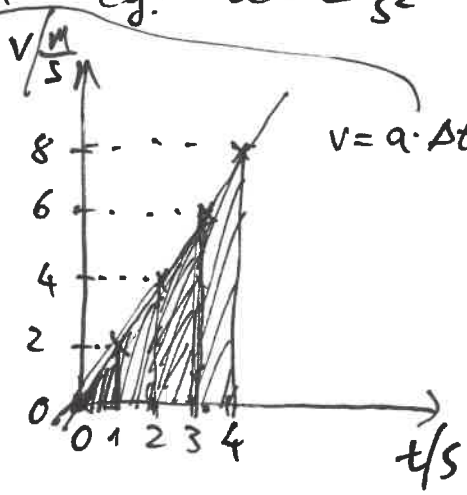
② Uniform acceleration eg: $a = 2\frac{m}{s^2}$

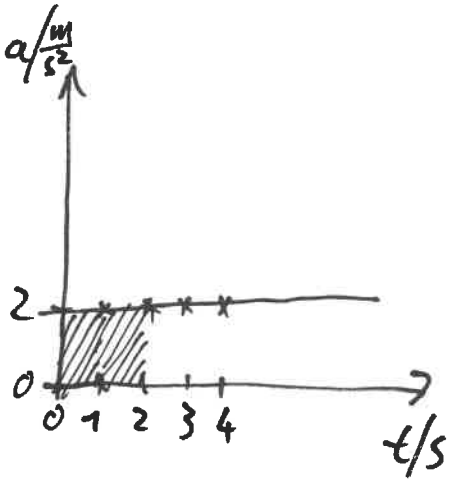


$s = \frac{\Delta v \cdot \Delta t}{2}$

$= \frac{a \cdot \Delta t \cdot \Delta t}{2}$

$= \frac{a \cdot \Delta t^2}{2}$





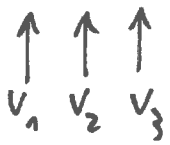
omega phi

track = displacement s | φ angular displacement

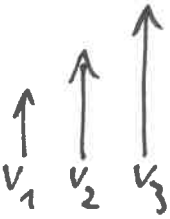
velocity $v = \frac{\Delta s}{\Delta t}$ | $\omega = \frac{\Delta \varphi}{\Delta t}$ angular velocity

acceleration $a = \frac{\Delta v}{\Delta t}$ ($\beta = \frac{\Delta \omega}{\Delta t}$ angular acceleration)

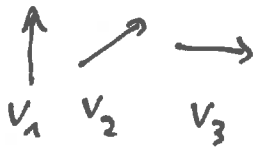
Uniform rectilinear motion



Uniform rectilinear acceleration



Uniform circular motion



$$a = \frac{\Delta v}{\Delta t} \qquad \Delta v = v_2 - v_1$$

$$\Delta v + v_1 = v_2$$

$$\Delta s = v \cdot \Delta t$$

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

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

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

$$\frac{\Delta s}{\Delta t} = v \quad ? \quad \omega = \frac{\Delta \varphi}{\Delta t}$$

Δs ? $\Delta \varphi = \frac{arc}{r}$ ($arc = \Delta s$)

$$\Delta s = r \cdot \Delta \varphi$$

$$v = r \cdot \omega$$

Unit conversions

$120 \cdot km = 120 \cdot 10^3 \cdot m$

$0.03\,(km)^3 = 0.03 \cdot (10^3 \cdot m)^3 = 0.03 \cdot (10^3)^3 \cdot m^3$

$= 0.03 \cdot 10^9\ m^3$

$4\,500\,000\ J = \frac{4\,500\,000\ 6 \cdot J}{10^9} = 4\,500\,000 \cdot 10^{-9}\ GJ =$ ($4\,500\,000 = 4.5 \times 10^6$)

$= 4.5 \times 10^{-3}\ GJ$

$12\ m^{-1} = 12 \cdot \left(\frac{mm}{10^3}\right)^{-1} = 12 \left(\frac{1}{10^3}\right)^{-1} \cdot mm^{-1} =$

$= 12 \cdot (10^3)^{-1} \cdot mm^{-1} = 12 \cdot 10^{-3}\ mm^{-1}$

$a^x \cdot b^x = (ab)^x \qquad \frac{a^x}{a^y} = a^{x-y} \qquad \frac{1}{a^x} = a^{-x}$

$a^x \cdot a^y = a^{x+y} \qquad (a^x)^y = a^{x \cdot y}$

$0.05\ hL = 0.05 \cdot 10^2\ L = 0.05 \cdot 10^2 \cdot \frac{dL}{10^{-1}}$

$1.23\ cm^3 = 1.23 \left(10^{-2} \cdot m\right)^3 = 1.23 \cdot \left(\frac{10^{-2}\ mm}{10^{-3}}\right)^3 =$

$= 1.23 \cdot \left(\frac{10^{-2}}{10^{-3}}\right)^3 \cdot mm^3$