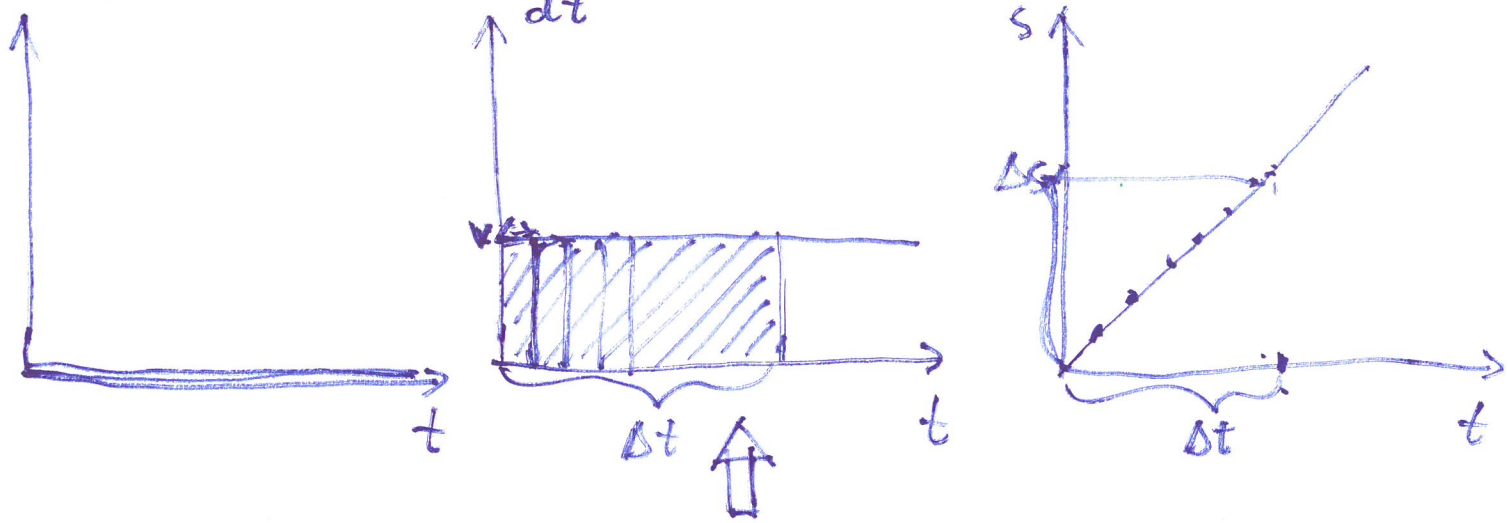
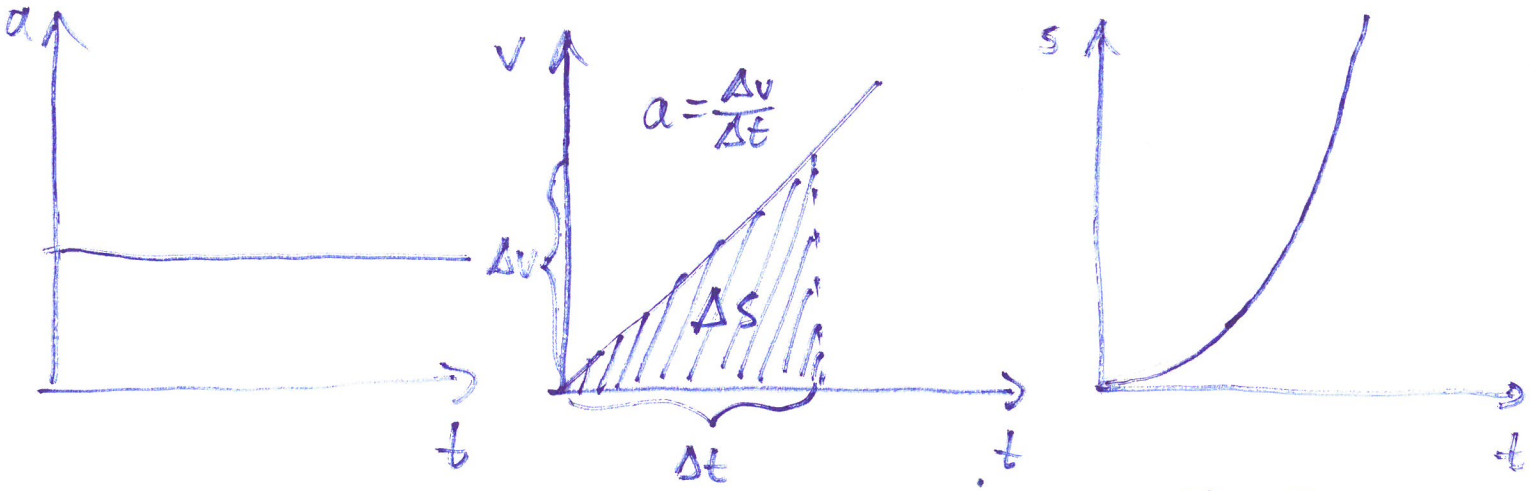
$a = \frac{\Delta v}{\Delta t}$ $v = \frac{\Delta s}{\Delta t}$

egyenes vonalú egyenletes mozgás



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

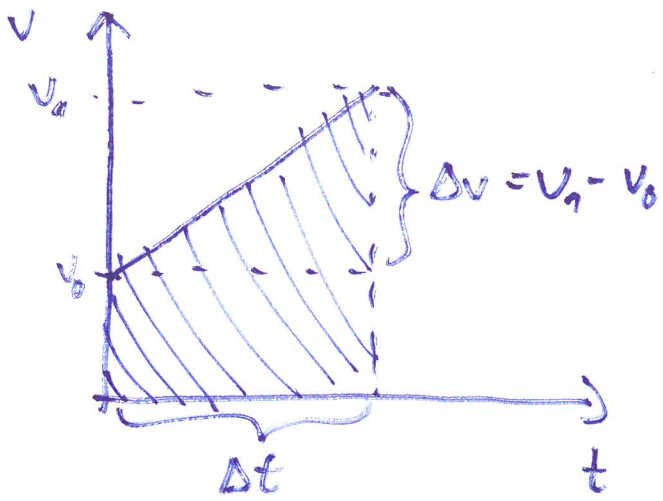
egyenes vonalú egyenletes gyorsulás



$v_0 = 0$

$$\left.\begin{aligned} \Delta s &= \frac{\Delta v \cdot \Delta t}{2} \\ \Delta v &= a \cdot \Delta t \end{aligned}\right\} \Delta s = \frac{a \cdot \Delta t \cdot \Delta t}{2} = \frac{a \cdot \Delta t^2}{2}$$

$v_0 \neq 0$ $\quad a \neq 0$



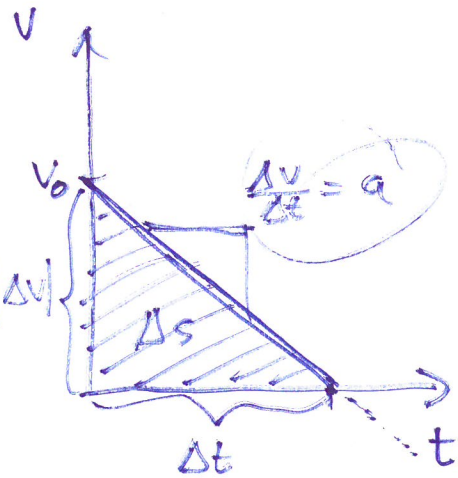
$$\Delta s = v_0 \cdot \Delta t + \frac{\Delta v \cdot \Delta t}{2}$$

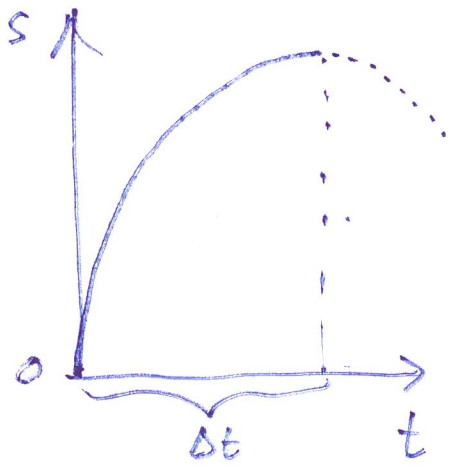
$$= v_0 \cdot \Delta t + \frac{a \cdot \Delta t^2}{2}$$

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

$v_1 = 0$

$a = g = -9{,}81 \frac{m}{s^2}$



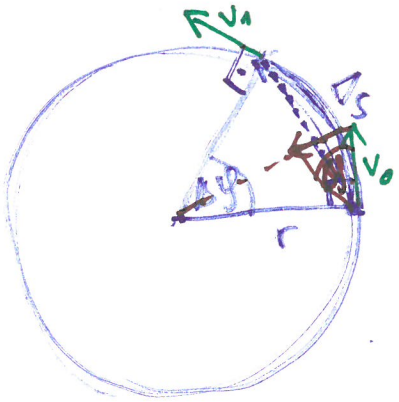


a) $\Delta t = \frac{\Delta v}{a} = \frac{-10 \frac{m}{s}}{-9{,}81 \frac{m}{s^2}} = 1{,}02\ s$ $\qquad \frac{\frac{m}{s}}{\frac{m}{s^2}} = \frac{m}{s} \cdot \frac{s^2}{m} = s$

b) $\Delta s = \frac{|\Delta v| \cdot \Delta t}{2} = \frac{10 \frac{m}{s} \cdot 1{,}02\ s}{2} = \frac{10{,}2\ m}{2} = 5{,}1\ m$

$\Delta\varphi = \frac{\Delta s}{r}$

$\omega = \frac{\Delta\varphi}{\Delta t}$ egyenletes körmozgás



$[T] = s$

$\frac{1}{[T]} = [f] = \frac{1}{s} = s^{-1} = Hz$

$$\frac{\Delta v}{v} \approx \frac{\Delta s}{r} = \Delta\varphi$$

Teljes kör: $\frac{2\pi}{T} = \omega = 2\pi \cdot f$

Sebesség: $v = \frac{\Delta s}{\Delta t} \rightarrow \Delta s = v \cdot \Delta t$

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

$$a = \frac{\Delta v}{\Delta t} = \frac{v_1 - v_0}{\Delta t}$$

$$\frac{\Delta v}{v} = \left(\frac{\Delta s}{r}\right) \frac{v \cdot \Delta t}{r}$$

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

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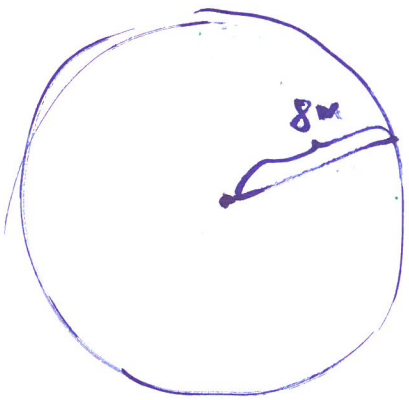

$r = 8\,m$

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

$N = 20$

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

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

c) $\omega = 2\pi f = 0{,}598\,\frac{1}{s}$

d) $v = \frac{\Delta s}{\Delta t} = \frac{2\pi r}{T} = \frac{2 \times 8\,m \cdot \pi}{10{,}5\,s} = 4{,}78\,\frac{m}{s}$