4.)

$U = 1\,kV$ $d = 5\,cm$ $\alpha = 60°$ $\vec{B} = ?$ e^- $m = 9{,}1 \cdot 10^{-31}\,kg$

a.) $\vec{B} \perp$ fC sík b.) $\vec{B} \parallel \vec{AC}$ $q = -e = -1{,}6 \cdot 10^{-19}\,C$

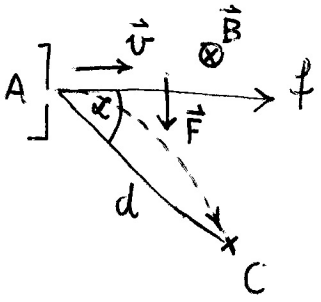
$W = qU$ $W = \Delta E_k$ $E_k = \frac{1}{2}mv^2$

$\vec{F} = q\vec{v} \times \vec{B}$ $a_{cp} = \frac{v^2}{R}$

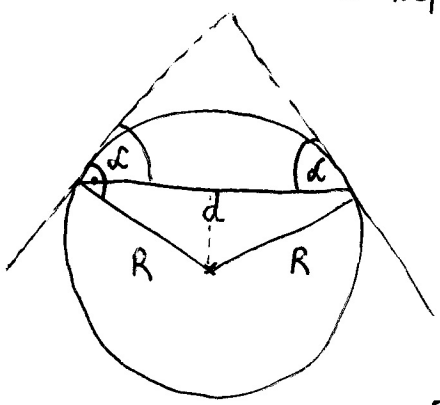
e^- sebessége: $W = eU = \Delta E_k$

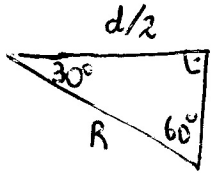
$eU = \frac{1}{2}mv^2 \Rightarrow \underline{\underline{v}}$

a.)



$\vec{F} = -e\vec{v} \times \vec{B} \rightarrow \vec{B}$ befelé





$\frac{d/2}{R} = \cos 30°$

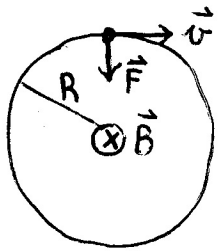
$R = \frac{d}{2\cos 30°} = \ldots$

$F_e = ma$

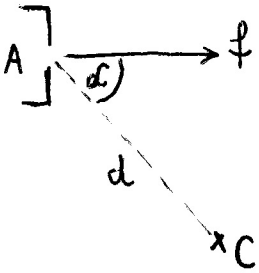
$evB = m\frac{v^2}{R}$

$\Downarrow$

$\underline{\underline{B}}$



b.)



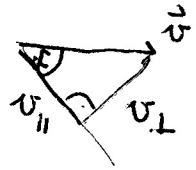
spirál alakú mozgás

T: periódusidő

t: repülési idő

$t = nT_n$ kell legyen

sugár R_n



$v_\parallel = v\cos\alpha$

$v_\perp = v\sin\alpha$

$t = \frac{d}{v_\parallel} = \ldots$

$T_n = \frac{t}{n} = \ldots$

$ev_\perp B_n = m\frac{v_\perp^2}{R_n}$

$R_n = \frac{mv_\perp}{eB_n}$ → $\frac{2R_n\pi}{v_\perp} = T_n$

$T_n = 2\pi\frac{m}{eB_n} \Rightarrow \underline{\underline{B_n}}$