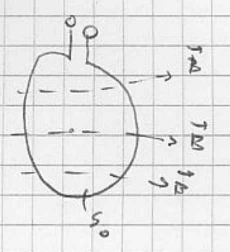
12.68.

$B(t) = 0,2t$; $S_0 = 1,8 \cdot 10^{-2}\,m^2$



a). $|\mathcal{E}_i| = \frac{d\Phi}{dt} = \frac{d}{dt}\left(B(t) \cdot S_0\right) = 0,2 \cdot 1,8\,10^{-2}\,\frac{d}{dt}t = \underline{\underline{3,6 \cdot 10^{-3}\,V}}$

b). Soit S_0, la surface initial : $S(t) = S_0 + s.t$

On suppose une variation affine de la surface. Soit s le taux de variation cherché.

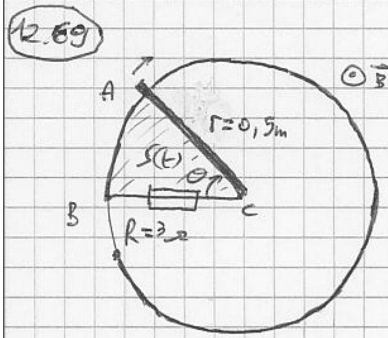
$\Rightarrow \Phi(t) = S(t) \cdot B(t) = (S_0 + st)\,0,2t = S_0\,0,2t + 0,2st^2$

$\Rightarrow |\mathcal{E}_i| = \frac{d}{dt}\Phi = S_0\,0,2 + 0,4.s.t = 3,6.10^{-3} + 0,4.s.t$

• en $t = 9s$, $B(t) = 1,8T$ $\Rightarrow |\mathcal{E}_i(t=9)| = 3,6.10^{-3} + 0,4.s.9 = 0$

$\Rightarrow s = \frac{-3,6.10^{-3}}{3,6} = \underline{\underline{-1.10^{-3}}}\,m^2/s$ $\Rightarrow$ l'aire diminue!

12.69



$\omega = 15\,\frac{rad}{s}$ $B = 3,8.10^{-3}T$

$\theta(t) = \omega t$

$S(t) = \frac{\theta(t)}{2\pi}\pi r^2$

$\Rightarrow \Phi(t) = B \cdot S(t) = \frac{Br^2}{2}\theta(t) = \frac{Br^2}{2}\omega t$

$i = \frac{d\Phi/dt}{R} = \frac{1}{R}B.r^2\omega\frac{1}{2} = \frac{Br^2\omega}{2R} = \frac{3,8.10^{-3}.0,5^2.15}{2.3} \cong \underline{\underline{2,4\,mA}}$