MAG. OBVODY

a) A.z. $\oint \vec{H} \cdot d\vec{l} = \underline{I}_{v\text{-}l}$

b) $\underline{\Phi}$ magnetický v obvodu $\underline{\Phi} = B \cdot S$

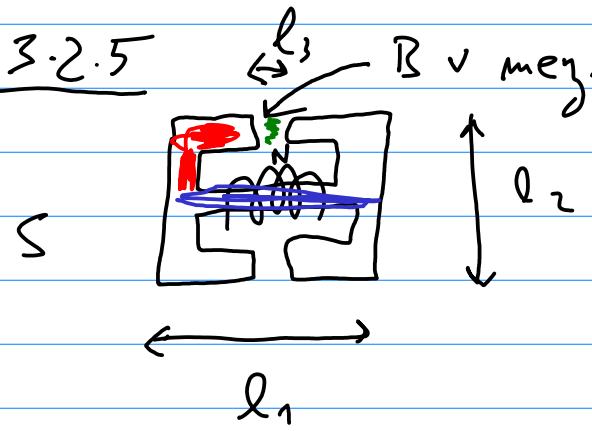
c) $\vec{B} = \mu \vec{H} + \vec{P}_m = \mu_0 (1 + \chi_m) \vec{H} = \mu \vec{H}$

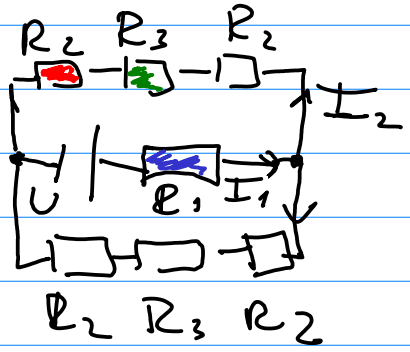
$$\oint \frac{B}{\mu} \cdot dl = N\underline{I}$$

$$\underline{\Phi} \oint \frac{dl}{\mu S} = N\underline{I}$$

"I" "R" "U"

3.2.5





$$I_2 = \frac{I_1}{2}$$

$$I_1 = \frac{U}{R}$$

$$R = \frac{1}{\frac{1}{R_3 + 2R_2} + \frac{1}{R_3 + 2R_2}} + R_1$$

$$= \frac{2R_2 + R_3}{2} + R_1 = R_2 + R_1 + \frac{R_3}{2}$$

$$I_2 = \frac{1}{2} \frac{U}{R_1 + R_2 + \frac{R_3}{2}}$$

$U \to NI \quad I_2 \to \underline{\Phi}_2 \quad R_1 \to \frac{l_1}{\mu S}$

$$R_2 \to \left(\frac{l_2}{8} + \frac{l_1 - l_3}{2}\right) / \mu S$$

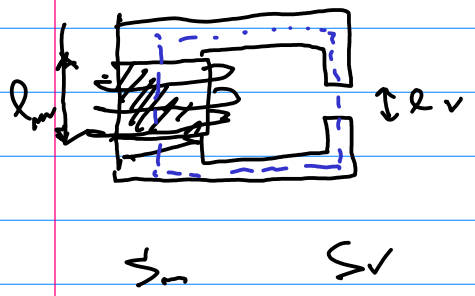
$$R_3 \to \frac{l_3}{\mu_0 S}$$

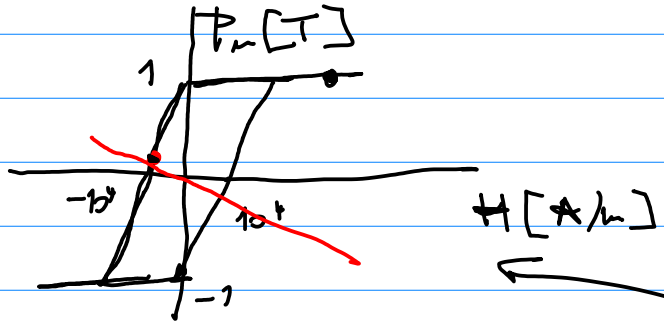
$$\Phi_2 = \frac{NI}{\frac{1}{2}\frac{l_1}{\mu S} + \frac{1}{2}\frac{l_2 + l_1 - l_3}{\mu S} + \frac{1}{2}\frac{l_3}{\mu_0 S}}$$

$\mu \to \infty$ $\qquad \Phi_2 = \frac{\mu_0 S N I}{l_3}$

$$B = \frac{\Phi_2}{S} = \frac{\mu_0 N I}{l_3}$$

3.2.6





$B_v = ?$

P_m vs H_m

1) $B_m S_m = B_v \cdot S_v$

2) $B_m = P_m + \mu_0 H_m$

3) $B_v = \mu_0 H_v$

4) A.z. $\oint H \cdot dl = 0$

$H_m \cdot l_m = -H_v \cdot l_v$

5) $P_m(H_m)$

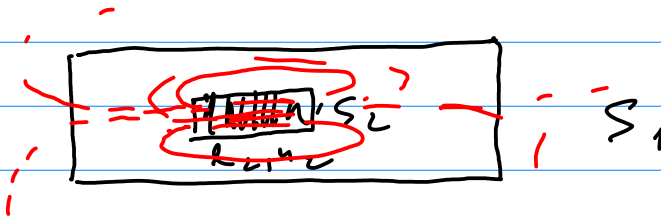
$$P_m = -\mu_0 H_m \left(1 + \frac{S_v \cdot l_m}{S_m \cdot l_v}\right) = \ldots = -5\mu_0 H_m$$

$$= -20\pi \cdot 10^{-7} H_m$$

. . . . . ATD.

3.4.12. INDUCTANCIA

$\Phi = IL$



l_1, n_1

$\Phi_1 = L_{11} I_1 + L_{12} I_2$

$\Phi_2 = L_{21} I_1 + L_{22} I_2$

$L_{12} = ?$ $L_{21} = ?$

$\Phi_2 \ (I_2 = 0 \ , I_1 \neq 0)$

$B_1 = \mu_0 n_1 \cdot I_1$

$\Phi_2 = B_1 \cdot S_2 \cdot n_2 \cdot l_2$

$\Phi_2 = \underbrace{\mu_0 n_1 n_2 S_2 l_2}\, I_1$

$L_{21} = L_{12}$

$L_{12} = ?$ $L_{12} = L_{21}$

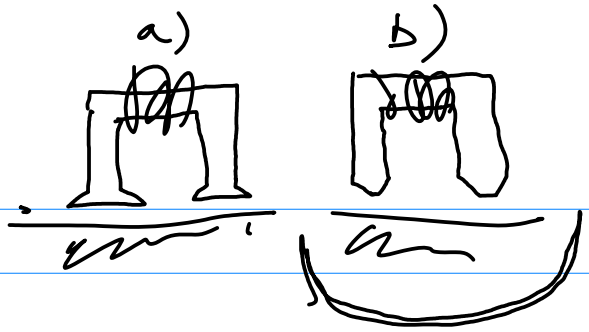
$\Phi_1 = \int_{S_1} \vec{B}_{21} \cdot d\vec{S}_1 = \int_{S_1} (\nabla \times \vec{A}_{21}) \cdot d\vec{S}_1 =$

$= \oint_{l_1} \vec{A}_{21} \cdot d\vec{l}_1$ $\quad A_{21} = \frac{\mu_0 I_2}{4\pi} \oint_{l_2} \frac{d\vec{l}_2}{R_{12}}$

$\Phi_1 = \frac{\mu_0 I_2}{4\pi} \oint_{l_1} \oint_{l_2} \frac{d\vec{l}_2 \cdot d\vec{l}_1}{R_{12}}$

$\Rightarrow L_{12} = L_{21}$

3.5.8 3.5.9



$$W = \frac{1}{2}\vec{B}\cdot\vec{H} \qquad B = \mu_0 H$$

$$W = \frac{1}{2}\frac{B^2}{\mu_0}\cdot S\cdot l \qquad \Phi = B\cdot S \text{ je konst.}$$

$$F = \frac{\partial W}{\partial l} = \frac{1}{2}\frac{\Phi^2}{S\mu_0}$$

STRIDAVÉ OBVODY

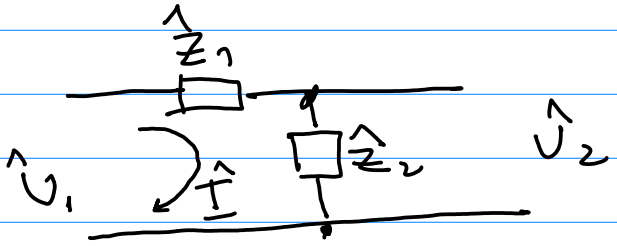
$$\hat{I} = I_0 e^{i\omega t}$$
$$\hat{U} = U_0 e^{i\omega t}$$
$$\hat{U} = \hat{Z}\hat{I}$$

odpor $\hat{Z} = R$

kond $\hat{Z}_c = \frac{1}{i\omega C}$ ← $I = C\frac{dU}{dt}$

cívka $\hat{Z}_L = i\omega L$ ← $U = L\frac{dI}{dt}$

FILTR

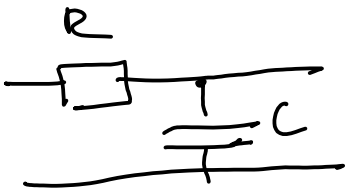


$$\hat{U}_2 = f(\hat{U}_1)$$

$$\hat{Z} = \hat{Z}_1 + \hat{Z}_2$$

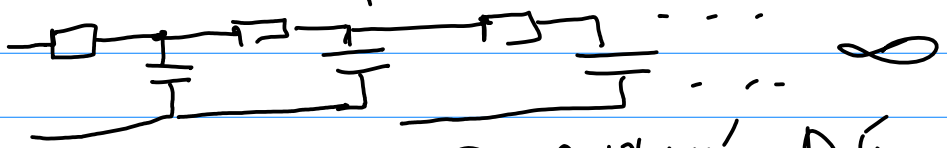
$$\hat{I} = \frac{\hat{U}_1}{\hat{Z}_1 + \hat{Z}_2} \qquad \hat{U}_2 = \frac{\hat{Z}_2}{\hat{Z}_1 + \hat{Z}_2}\hat{U}_1$$

$Z_1 = R_1 \quad Z_2 = R_2 \rightarrow$ DĚLIČ



$$\hat{U}_2 = \frac{\frac{1}{i\omega C}}{R + \frac{1}{i\omega C}} \hat{U}_1$$

$$= \frac{1}{i\omega RC + 1} \hat{U}_1$$



Dzielnik napięcia D.G.