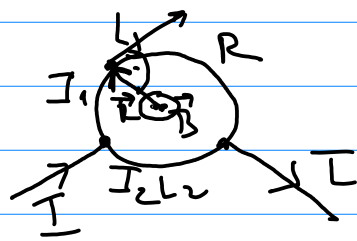
MAGNETOSTATIKA

$$\nabla \cdot \vec{B} = 0$$

$$\nabla \times \vec{B} = \mu_0 \vec{j} \quad \longleftrightarrow \quad \text{A.Z.} \quad \oint \vec{B} \cdot d\vec{l} = \mu_0 I_{in} \quad \left(= \int_S \nabla \times \vec{B} \, d\vec{S} \right)$$

$$\text{B.S.Z.} \quad d\vec{B}(\vec{r}) = \frac{\mu_0}{4\pi} \frac{d\vec{I} \times \vec{r}}{r^3}$$

$\boxed{3.1.1.}$



$\vec{B}$(sredi)

$$d\vec{I}_1 = I_1 \cdot d\vec{l}$$

$$I_1 = \frac{U}{R_1} \quad I_2 = \frac{U}{R_2} \quad R_{1,2} \sim L_{1,2}$$

$$I_1 L_1 = I_2 L_2$$

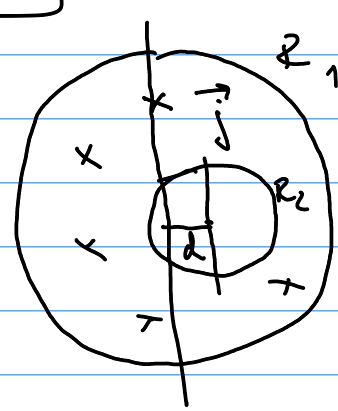
$$I_1 + I_2 = I \qquad I_{1,2} = I \frac{L_{2,1}}{L_1 + L_2}$$

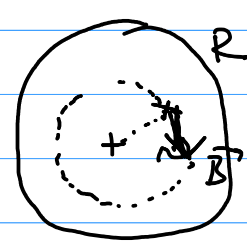
$$B_1 = \int_{L_1} \frac{\mu_0}{4\pi} I \frac{L_2}{L_1 + L_2} \cdot \frac{|d\vec{l} \times \vec{r}|}{r^3} = \frac{\mu_0}{4\pi} I \frac{L_2}{L_1 + L_2} \cdot \frac{1}{r^2} \cdot L_1$$

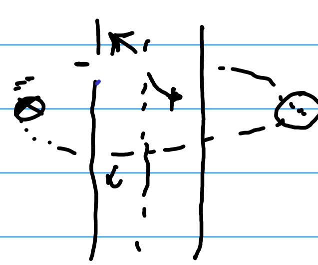
$$B_2 = -\frac{\mu_0}{4\pi} I \frac{L_1}{L_1 + L_2} \cdot \frac{1}{r^2} \cdot L_2$$

$$B = B_1 + B_2 = \underline{\underline{0}}$$

$\boxed{3.1.2}$



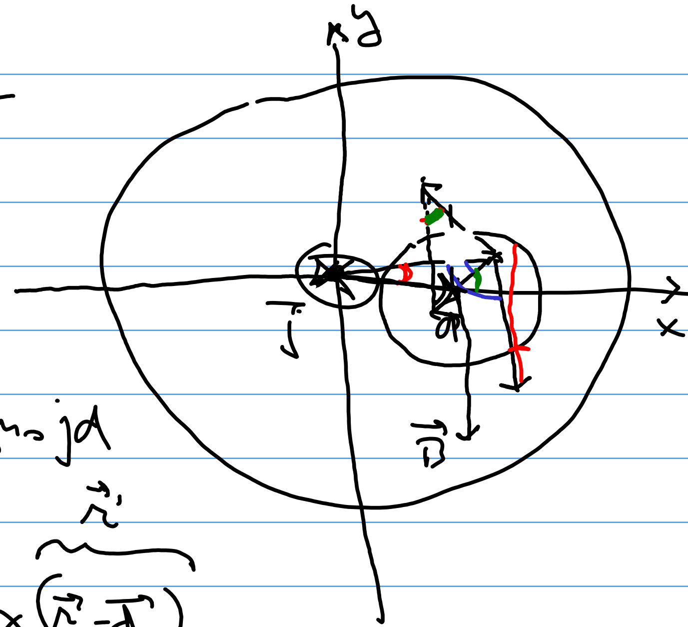




$$\oint \vec{B}\cdot d\vec{l} = \mu_0 I_{in}$$

$$B\cdot 2\pi r = \mu_0 j\cdot \pi r^2$$

$$B = \frac{1}{2}\mu_0 j r$$



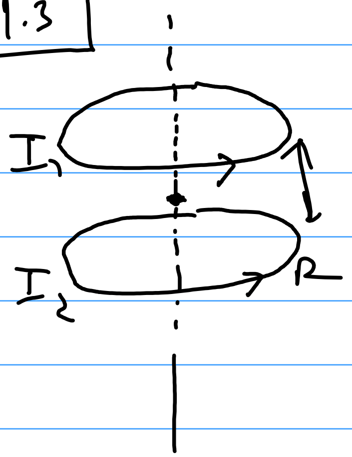
$$B_x = 0$$

$$B_y = \mu_0 \frac{j}{2}(x_2 - x_1) = \frac{1}{2}\mu_0 j d$$

$$\vec{B} = \frac{1}{2}\mu_0 \vec{j}\times\vec{r} - \frac{1}{2}\mu_0 \vec{j}\times\overbrace{(\vec{r}-\vec{d})}^{\vec{r}'}$$

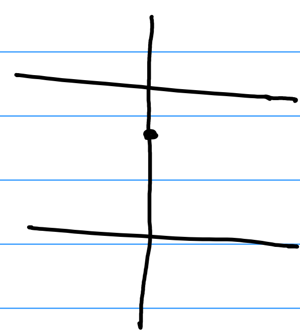
$$= +\frac{1}{2}\mu_0 \vec{j}\times\vec{d} \quad \Rightarrow \quad B_x = 0, \quad B_y = -\frac{1}{2}\mu_0 j d$$

$\boxed{3.1.3}$

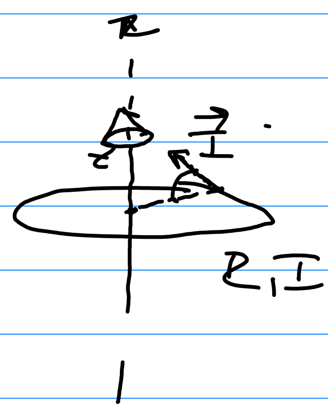


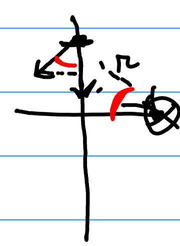
$\vec{B}$ (osa)

$I_1 = \pm I_2$



1 smyčka :





$$\frac{dB_z}{dB} = \frac{R}{r}$$

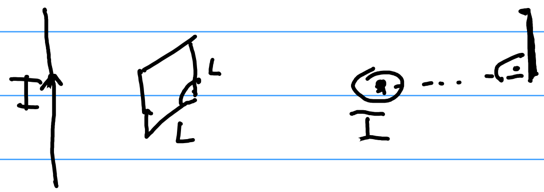
$$d\vec{B} = \frac{\mu_0}{4\pi}\frac{d\vec{I}\times\vec{r}}{r^3} \qquad \vec{B} = \int \frac{\mu_0}{4\pi}\frac{I\,d\vec{l}\times\vec{r}}{r^3}$$

$$\vec{B} = (0, 0, B_z) \qquad B = \frac{\mu_0}{4\pi}\int \frac{I\,dl}{r^2}\cdot\frac{R}{r}$$

$$=$$

$$= \frac{\mu_0}{4\pi} I \, 2\pi R \cdot \frac{R}{r^3} = \frac{\mu_0}{2} I \frac{R^2}{r^3}$$

D.Ú. 3.1.9



$$\Phi = ? = \int_S \vec{B} \cdot d\vec{S}$$