31187

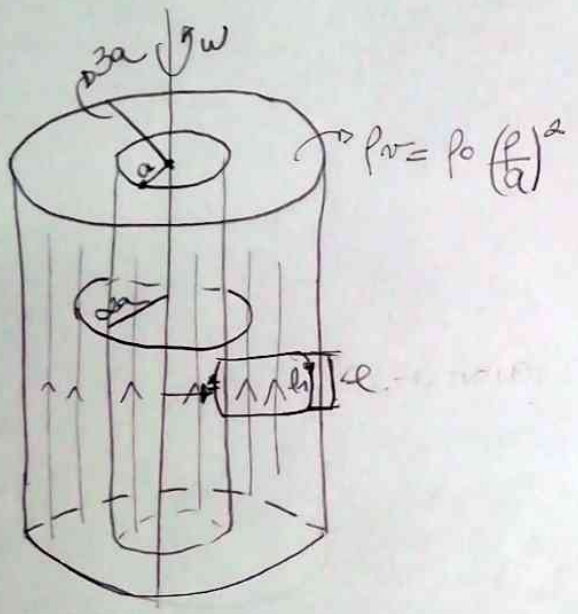
Cálculo do n:

$$n = \left(\frac{7 \times 5}{9}\right) - 1 \rightarrow n = \underline{2}$$

Então,

$$\rho_V = \rho_0 \left(\frac{\rho}{a}\right)^2$$

(1)



• Determinar o vetor campo magnético $\vec{B}$ em todas as regiões do espaço.

$$\vec{J}(\vec{r}) = \rho_V \vec{v}$$

$$\vec{J}(\vec{r}) = \rho_0 \frac{\rho^2}{a^2} \omega_0 \rho \hat{\varphi}$$

$$\vec{J}(\vec{r}) = \frac{\rho_0 \omega_0 \rho^2 \hat{\varphi}}{a^2}$$

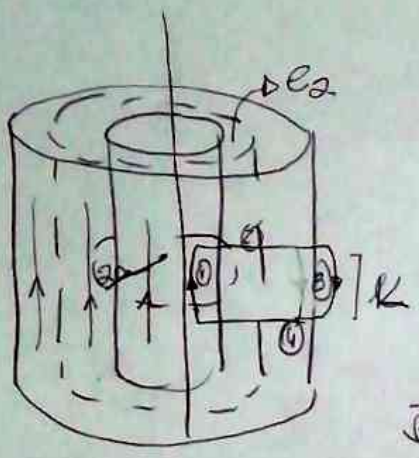
↳ corresponde aos raios que vão de a até 3a

• Campo magnético para $\rho > 3a$ (e1)

$$\vec{B} = 0$$

• Campo magnético para $a < \rho < 3a$ (C_2)

Espira circular com raio 2a.



$$\oint \vec{B}\, d\vec{r} = \int_1 \vec{B}\, d\vec{r}_1 + \int_2 \vec{B}\, d\vec{r}_2 + \int_1 \vec{B}\, d\vec{r} + \int_3 \vec{B}_3\, d\vec{r}$$

$\int_2 \vec{B}\, d\vec{r}_2 = 0$

$= B(\rho)\, l$

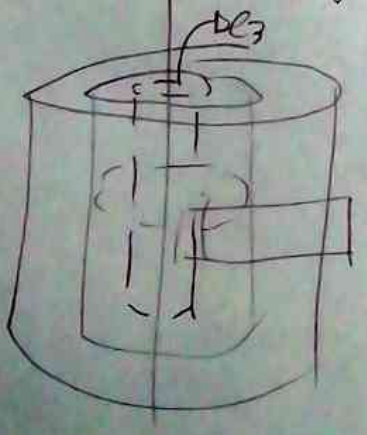
Então

$$\vec{B} = \mu_0 \int_0^K \int_\rho^{3a} \rho^2 \omega_0 \hat{\varphi}\, \hat{\varphi}\, d\rho\, dz$$

$$\vec{B} = \mu_0 \frac{\rho_0}{3a^2} \omega_0 K (27a^3 - \rho^3)$$

$$\vec{B} = \mu_0 \frac{\rho_0}{3a^2} \omega_0 K (27a^3 - \rho^3)\, \hat{z}$$

• Campo magnético para $a < \rho < 2a$ (C_3)



$$\vec{B} = \mu_0 \int_0^K \int_a^{3a}$$