3 Задача

$$\oint_L \vec{H}\,d\vec{l} = \int_S \left(\vec{j} + \frac{\partial \vec{D}}{\partial t}\right) d\vec{S}$$

$$\vec{H} \parallel d\vec{l}$$

$$\vec{H}\,d\vec{l} = H\,dl$$

$$\oint_L \vec{H}\,d\vec{l} = \oint_L H(r)$$

$$\oint_L \vec{H}\,d\vec{l} = \oint_L H(r)\,dl = H(r)\oint_L dl = H(r)\,2\pi r$$

$$\frac{\partial \vec{D}}{\partial t} = 0$$

$$\int_S \vec{J}\,\vec{dS}$$

$$j\,dS = j\,dS$$

$$\vec{j} \parallel \vec{dS} \qquad j = \frac{I}{S(a)^2} = \frac{I}{\pi a^2}$$

1. $r \leq a$

$$\int \vec{j}\,\vec{dS} = j\int_S dS = \frac{I}{\pi a^2}\pi r^2 = \frac{I}{a^2}r^2$$

$$2\pi r \cdot H_1(r) = I \cdot \frac{r^2}{a^2}$$

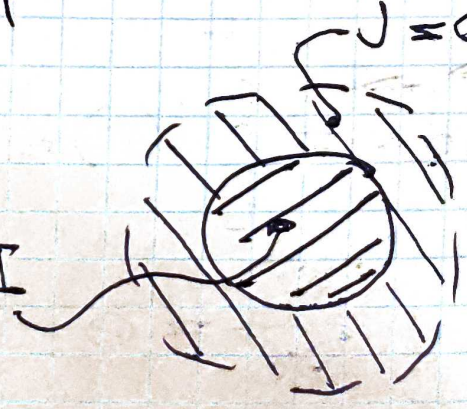
$$H_1(r) = \frac{I}{2\pi a^2} r$$

$$\vec{B} = \mu_a \vec{H}$$

$$B_1(r) = \frac{I}{2\pi a^2}\mu_a r$$

2. $r > a$

$$\int_S \vec{j}\,\vec{dS} = I$$



$$H_2(r) \cdot 2\pi r = I$$

$$H_2(r) = \frac{I}{2\pi r} \qquad H_2(a) = \frac{I}{2\pi a}$$

$$B_2(r) = \frac{I}{2\pi r} M_{02}$$