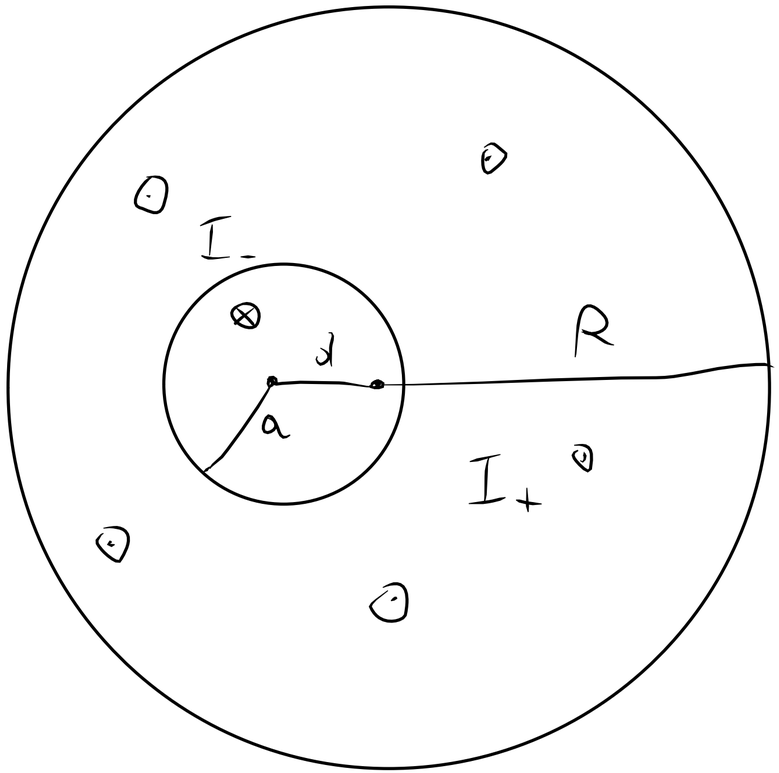

pełny walec

$$I = j\pi(R^2 - a^2) = I_+ + I_-$$

$$= j\pi R^2 - j\pi a^2$$

$$I_+ = j\pi R^2 = I\frac{R^2}{R^2 - a^2}$$

$$\mu_0 I_{+in} = \int B(r)\,dl$$

$$\mu_0 I_{+in} = 2\pi r B(r)$$

wydrążenie:

$$B(r)_+ = \frac{\mu_0 I_+}{2\pi r} = \frac{\mu_0}{2\pi r} I_+ \frac{\pi r^2}{\pi R^2} = \frac{\mu_0 r}{2\pi R^2} I_+$$

$$B_-(r') = \frac{\mu_0 I_{-in}}{2\pi r'} = \frac{\mu_0 r'}{2\pi a^2} I_-$$

B w środku wydrążenia:

$$B = B_-(0) + B_+(d) = \frac{\mu_0 d}{2\pi R^2} I_+ = \frac{\mu_0 d I}{2\pi(R^2 - a^2)}$$