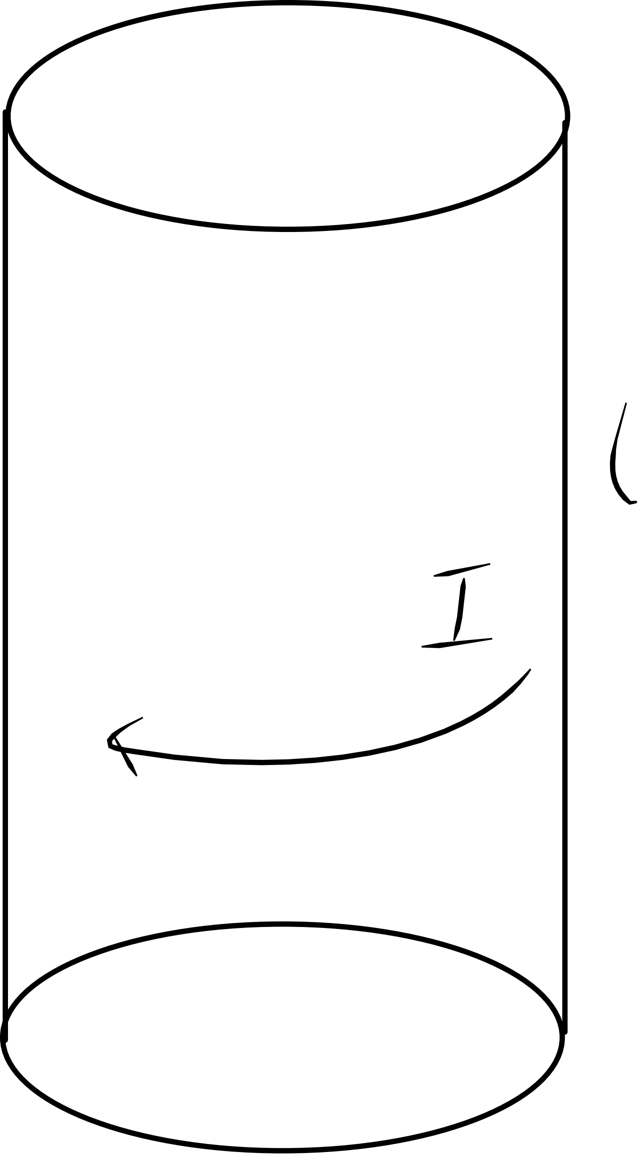


$$B = \frac{\mu_0 I}{l} \qquad S = S_0 e^{-\lambda t} \qquad R = R_0 e^{-\lambda t}$$

$$I = \frac{\varepsilon}{R} = \frac{1}{R}\left(\frac{-d\Phi}{dt}\right)$$

$$\phi(t) = \left(B_0 + B(t)\right) S(t) = \left(B_0 + \frac{\mu_0 I(t)}{l}\right) S_0 e^{-\lambda t}$$

$$\frac{d\phi}{dt} = -\lambda S_0 B_0 e^{-\lambda t} + \frac{\mu_0 S_0}{l} e^{-\lambda t}\left(\dot{I}(t) - \lambda I(t)\right)$$

$$I(t) = \frac{-S_0 B_0}{R_0}\lambda + \frac{\mu_0 S_0}{l R_0}\dot{I}(t) - \frac{\mu_0 S_0}{l R_0}\lambda I(t)$$

$$\dot{I}(t) - I(t)\underbrace{\left(\lambda + \frac{l R_0}{\mu_0 S_0}\right)}_{A} = \underbrace{\frac{\lambda B_0 l}{\mu_0}}_{C}$$

RORJ

$$\frac{\dot{I}(t)}{I(t)} = A$$

$$\ln(I(t)) = At + \ln D$$

$$I(t) = D e^{At}$$

RSRN

$$I(t) = D(t) e^{At}$$

$$\dot{I}(t) = \dot{D}(t) e^{At} + A D(t) e^{At}$$

$$\dot{D}(t) e^{At} + \cancel{A D(t) e^{At}} - \cancel{A D(t) e^{At}} = C$$

$$\dot{D}(t) = C e^{-At}$$

$$D(t) = \frac{-C}{A} e^{-At} + E$$

RORN

$$I(t) = e^{At}\left(-\frac{C}{A} e^{-At} + E\right) = -\frac{C}{A} + E e^{At}$$

$$B = \frac{\mu_0 I}{l}$$

$$B(t) = \frac{\lambda B_0 l S_0 \mu_0}{l \mu_0 S_0 \lambda + l^2 R_0} + \frac{\mu_0 E}{l} e^{\lambda} + \frac{\mu_0 E}{l} e^{\frac{-l R_0}{\mu_0 S_0}}$$