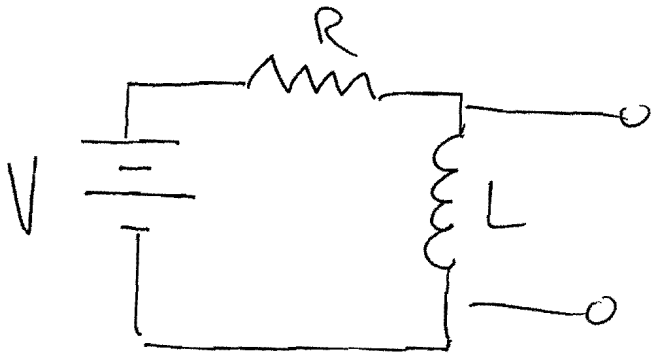


RL - time domain analysis :

①



$$\sum_{\text{closed loop}} \phi = 0$$

$$V = IR + L \frac{dI}{dt}$$

$$V - IR = L \frac{dI}{dt} \quad \text{so}$$

$$\int_0^t -\frac{R}{L} dt = \int_0^I \frac{dI'}{I' - \frac{V}{R}}$$

$$-\frac{R}{L} t = \frac{\ln(I - \frac{V}{R})}{\ln(-\frac{V}{R})} \rightarrow I = \frac{V}{R} (1 - e^{-\frac{R}{L} t})$$

$$V_L(t) = L \frac{dI}{dt}$$

$$V_L(t) = V e^{-\frac{R}{L} t}$$