

The switch closes at time $t = 0$.

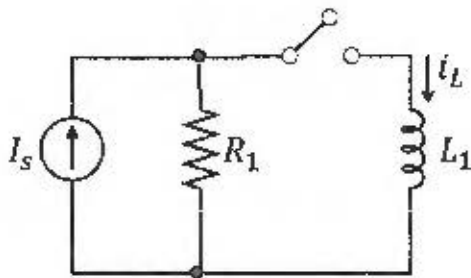
Find the current i_L for $t > 0$:

$$i_L(t) = A \cdot e^{-t/\tau} + B$$

$I_s : 2 \text{ A}$

$R_1 : 3 \text{ kohm}$

$L_1 : 30 \text{ mH}$



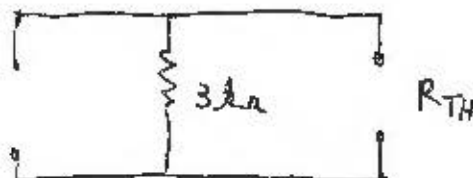
(a) $t = 0^- : i_L = 0$

(b) $t = 0^+ : i_L(0^+) = i_L(0^-) = 0 \text{ A}$

(c) $t = \infty :$



(d)



$$R_{TH} = 3 \text{ k}\Omega$$

$$\tau = \frac{L_1}{R_{TH}} = \frac{30 \cdot 10^{-3}}{3 \cdot 10^3} = 10 \cdot 10^{-6} \text{ s}$$

$$\tau = 0.01 \text{ ms}$$

$$B = i_L(\infty) = 2 \text{ A} \Rightarrow$$

$$B = 2 \text{ A}$$

$$A + B = i_L(0^+) = 0 \text{ A} \Rightarrow$$

$$A = -2 \text{ A}$$

$$i_L(t) = 2 - 2 e^{-\frac{t}{0.01 \text{ ms}}} \text{ A}$$

$$i_L(t) = 2 \left(1 - e^{-\frac{t}{0.01 \text{ ms}}} \right) \text{ A}$$