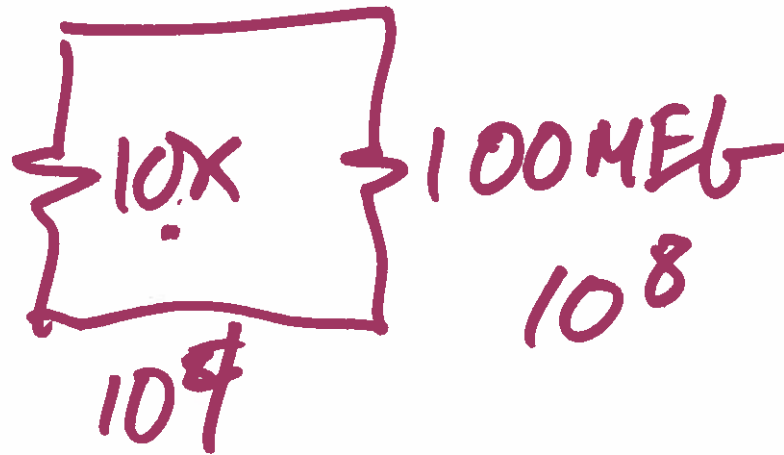


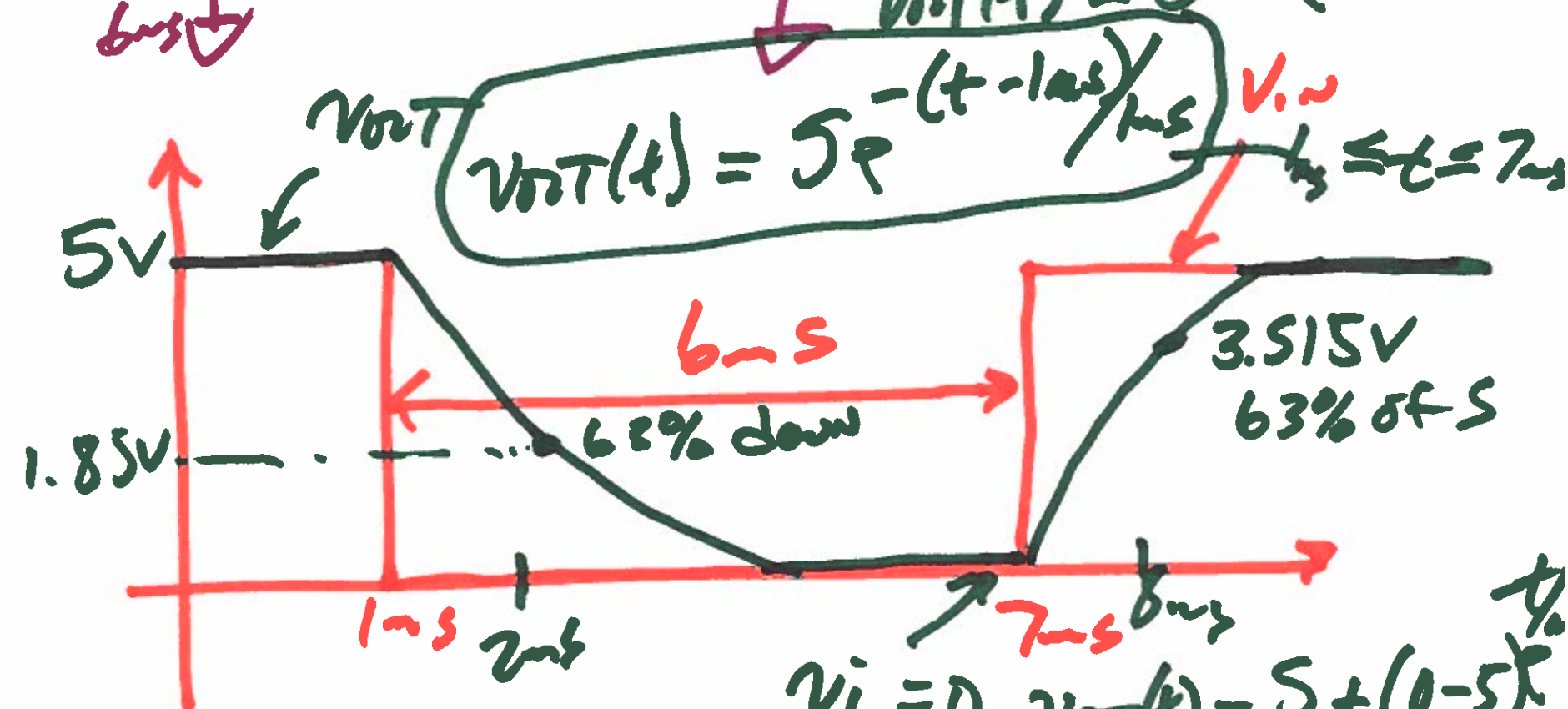
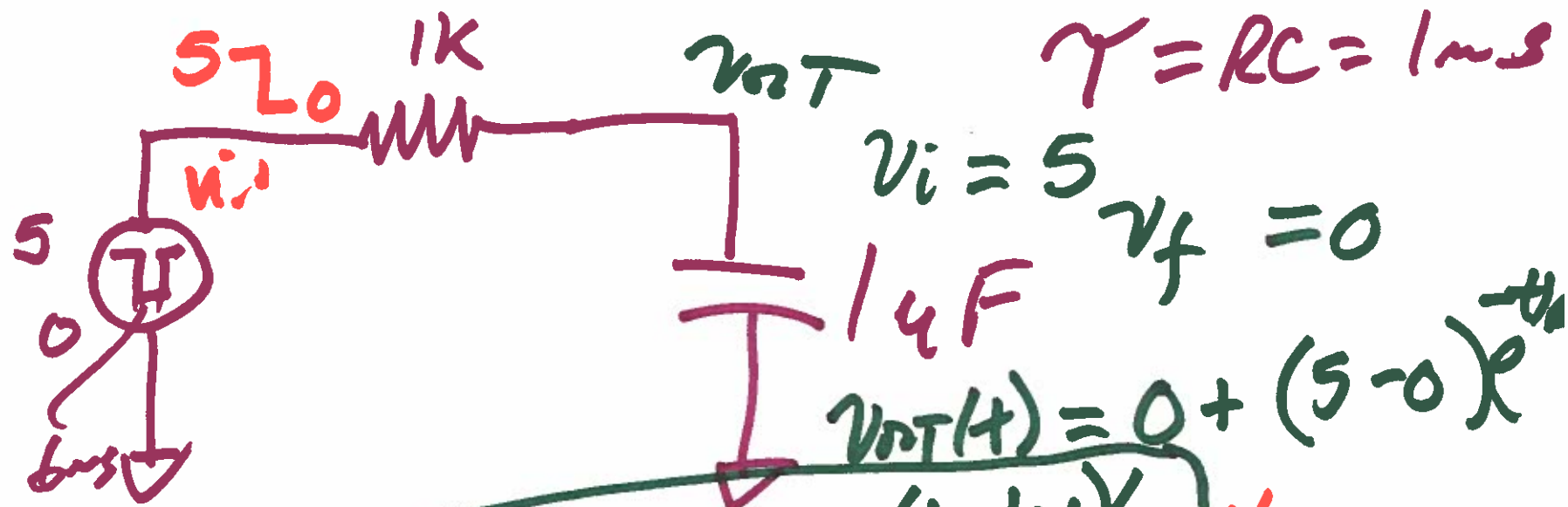
EE220 Circuits I

OCT. 28, 2019

Lecture 17

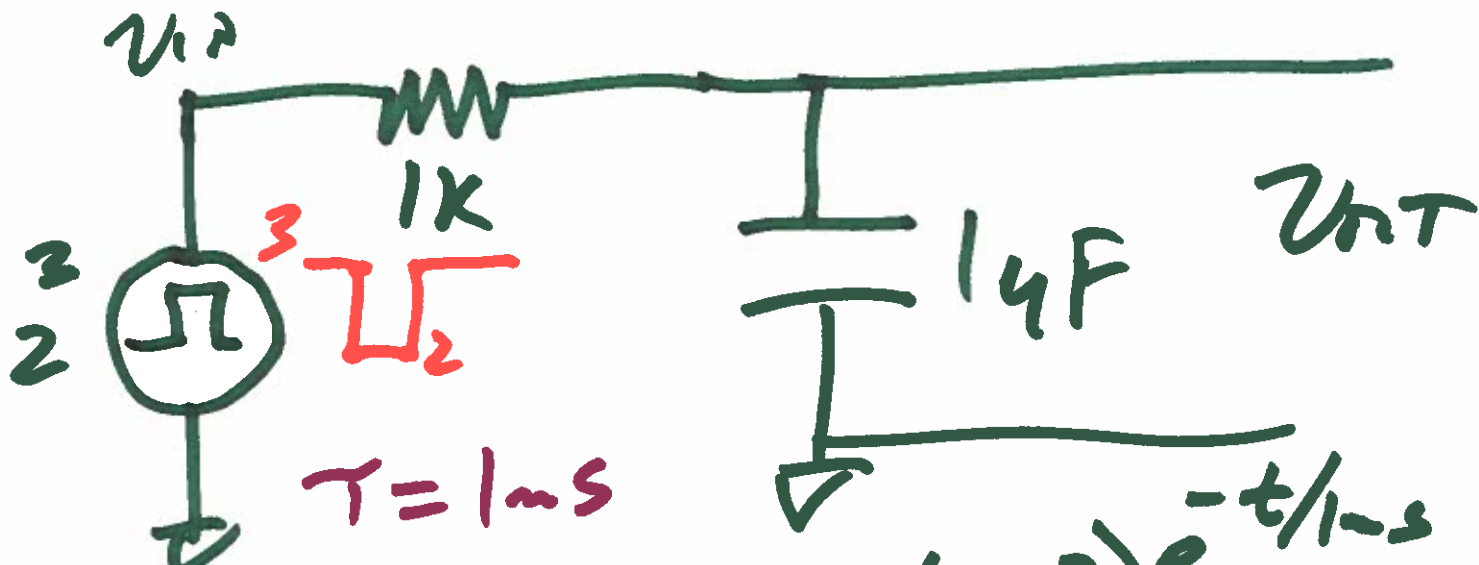


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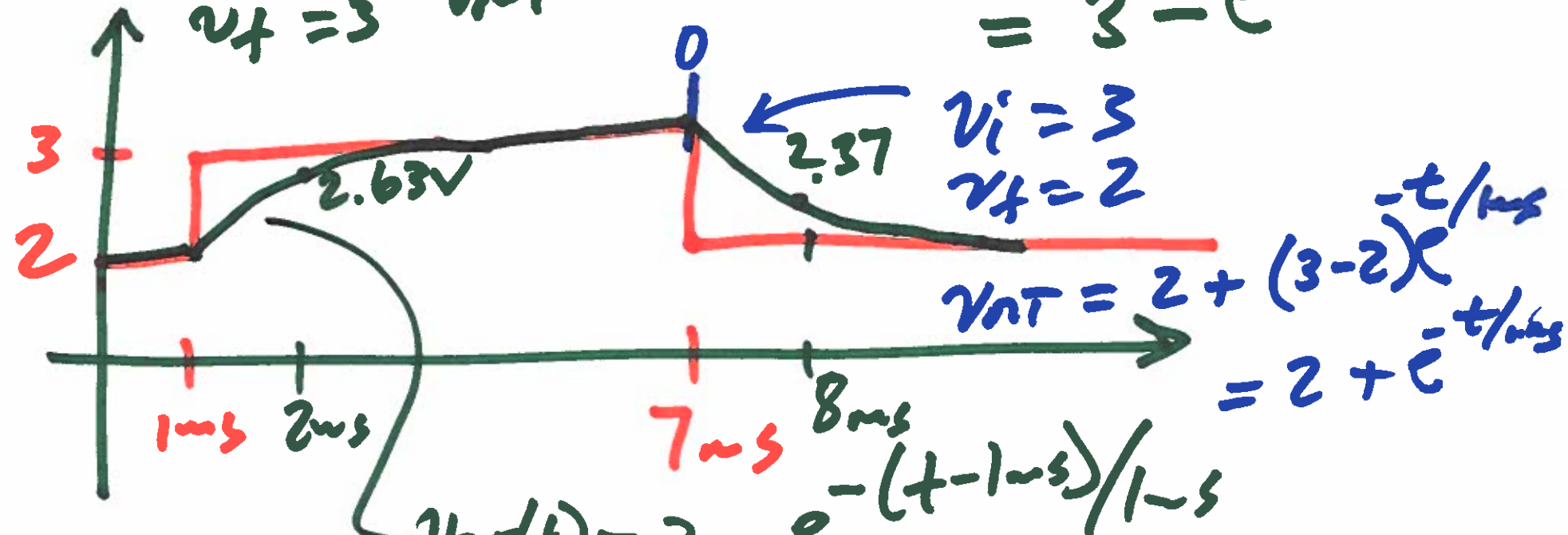


$v_i = 0$
 $v_f = 5$
 $v_o(t) = 5 + (0 - 5)e^{-t/\tau}$
 $= 5(1 - e^{-t/\tau})$

2)



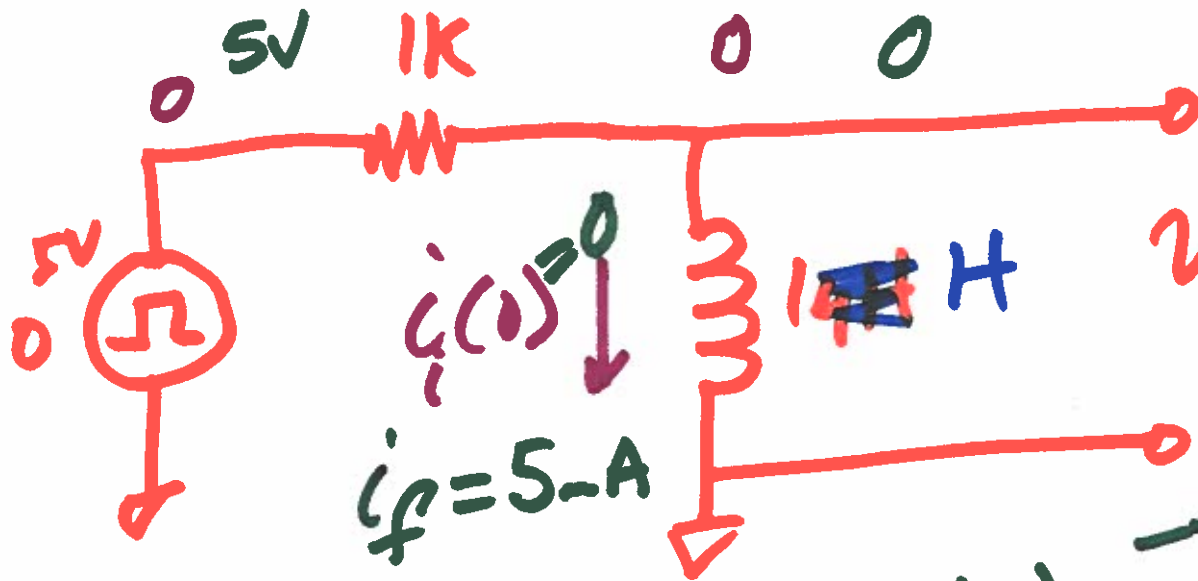
$v_i = 2$
 $v_f = 3$
 $v_C(t) = 3 + (2 - 3)e^{-t/1ms}$
 $= 3 - e^{-t/1ms}$



$v_C(t) = 3 - e^{-(t-1ms)/1ms}$

$1ms \leq t \leq 7ms$

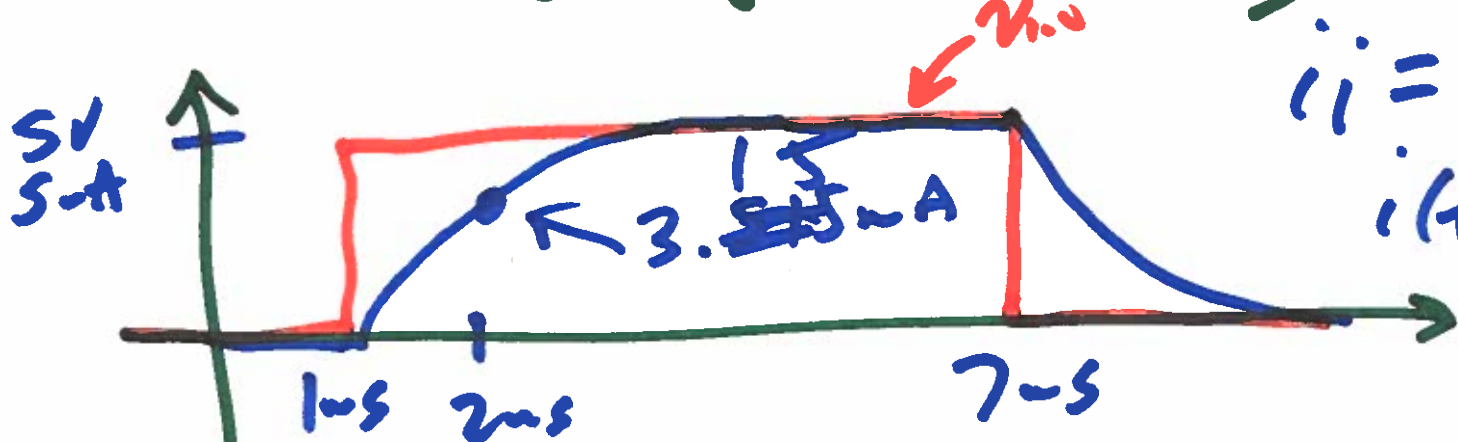
3)



$$T = \frac{L}{R} = 1\mu\text{s}$$

$$i(t) = i_f + (i_i - i_f)e^{-t/\tau/R}$$

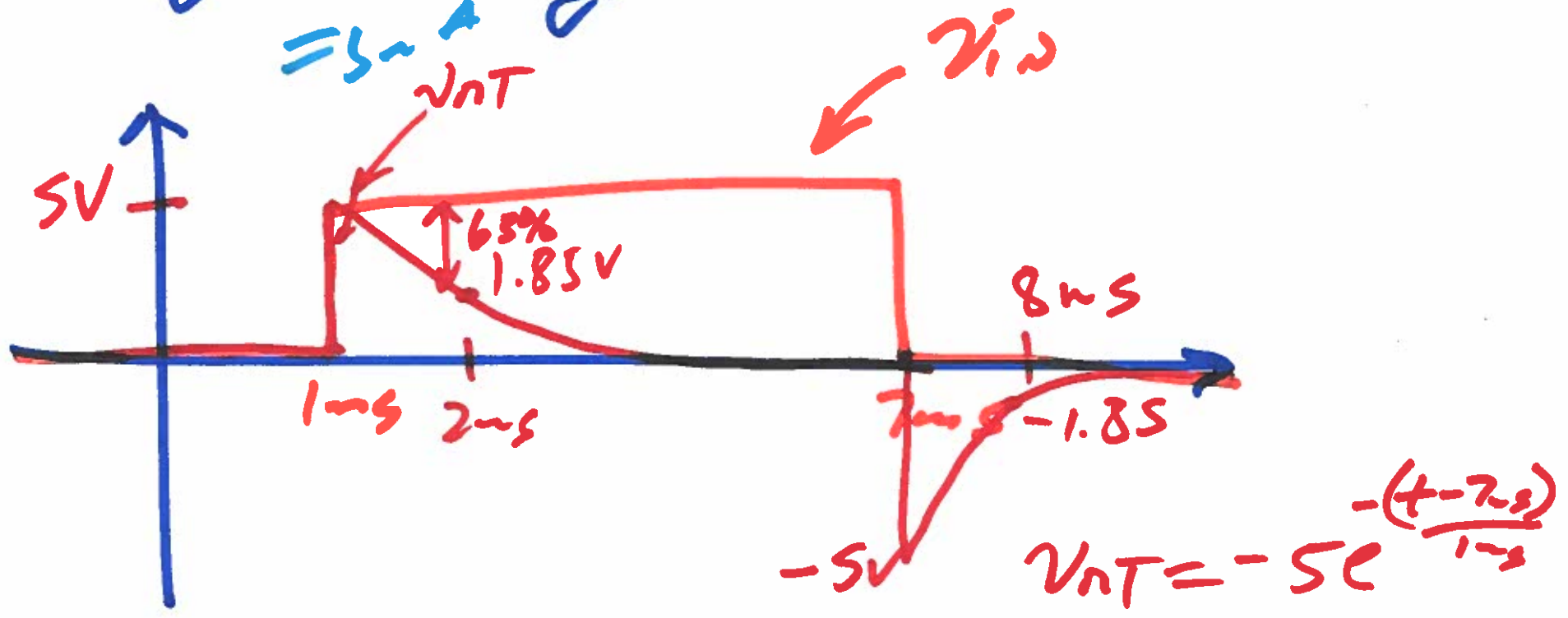
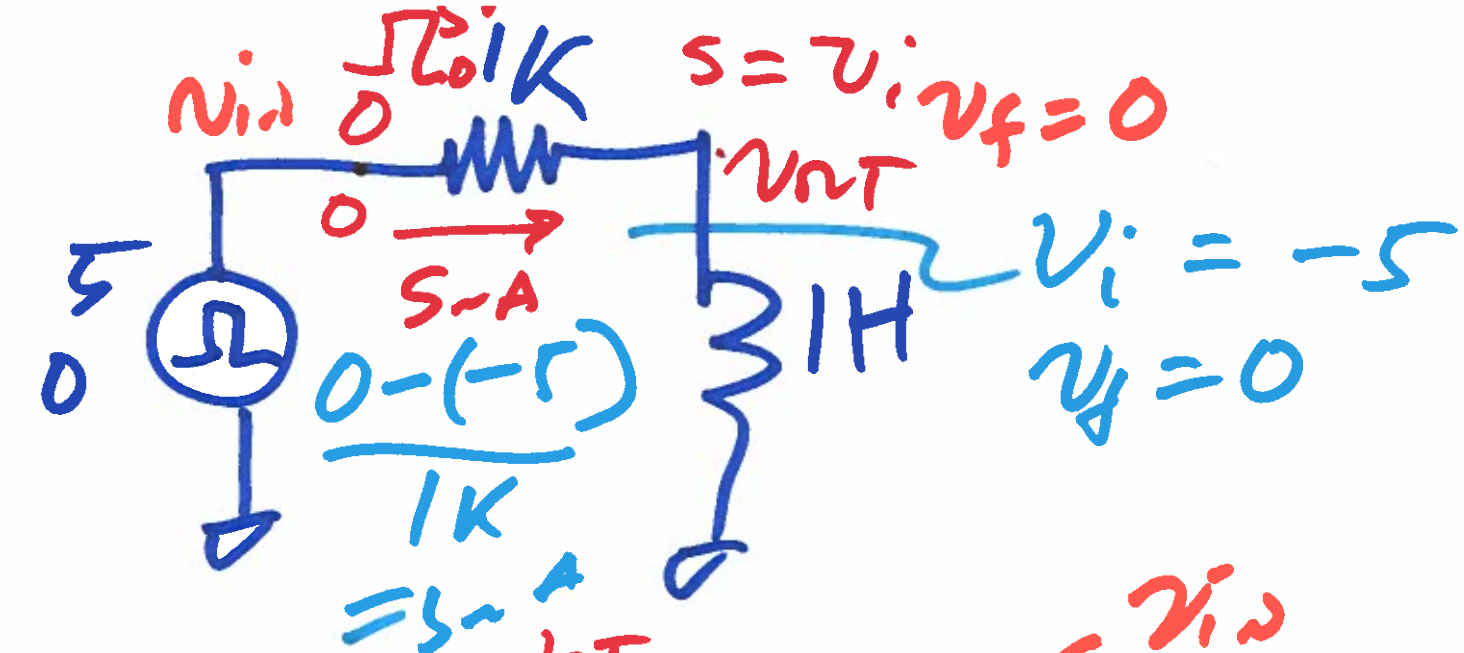
$$= 5\text{mA}(1 - e^{-t/1\mu\text{s}})$$



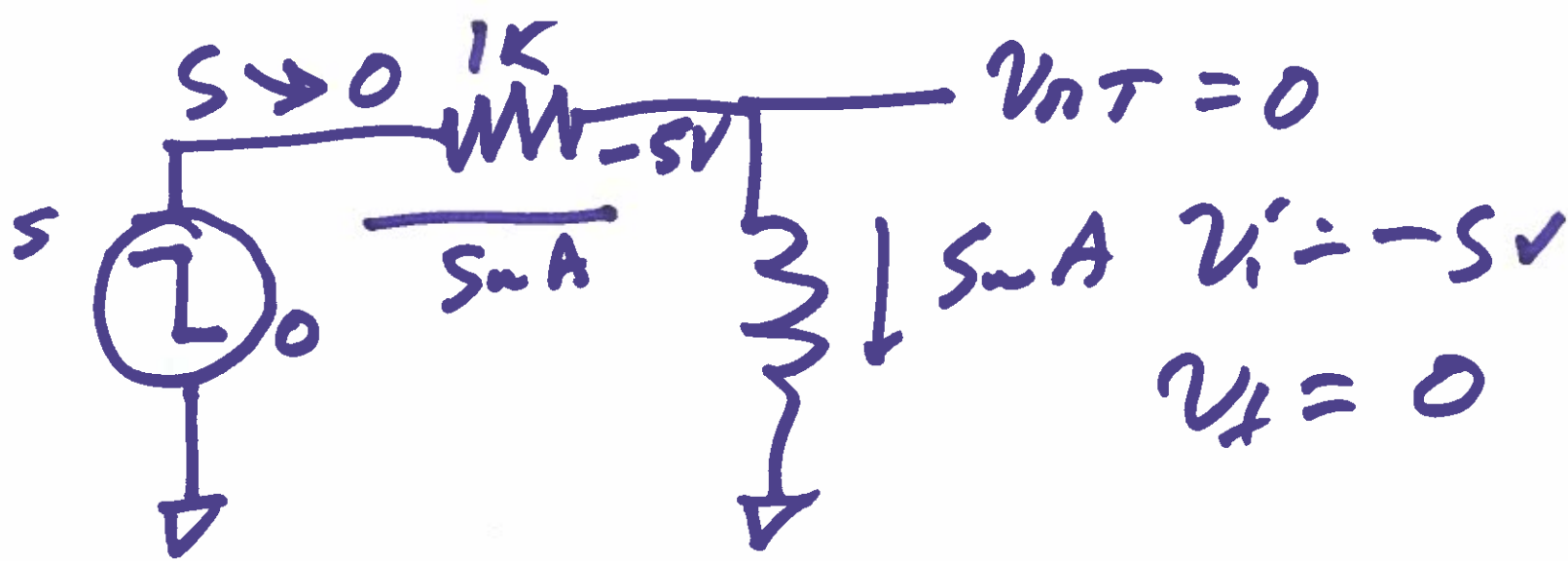
$$i_i = 5\text{mA} - \frac{(t - 7\mu\text{s})}{1\mu\text{s}}$$

$$i(t) = 5\text{mA}e^{-\frac{t-7\mu\text{s}}{1\mu\text{s}}}$$

4)



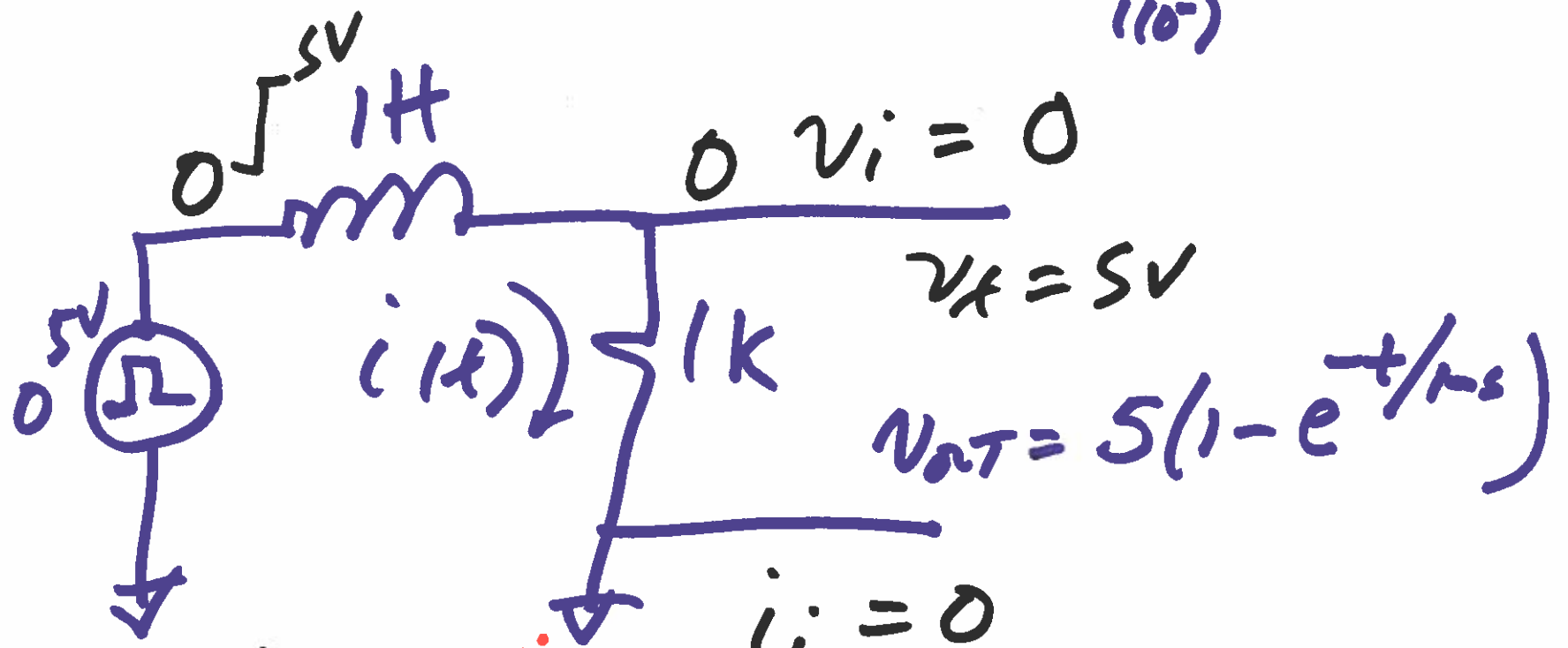
5)



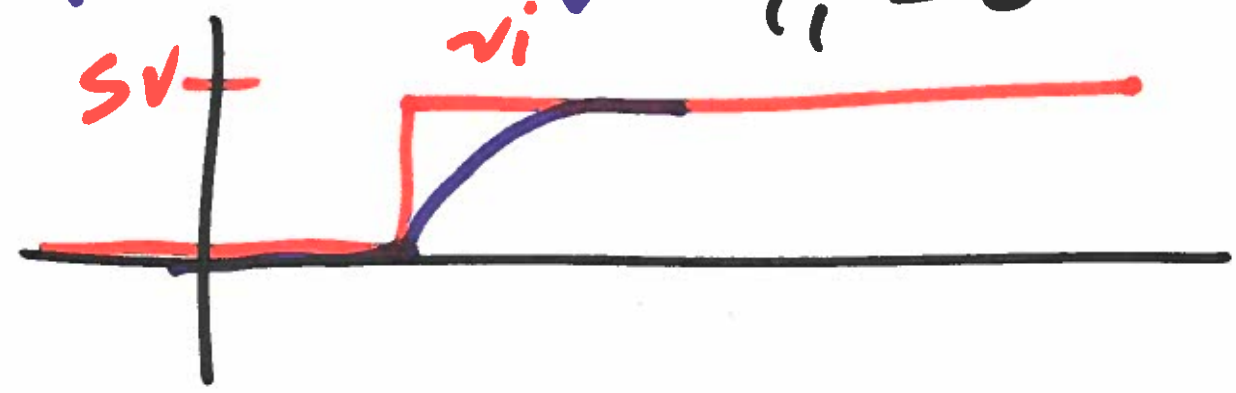
$$\frac{0 - (-5)}{1K} = 5uA$$

6)

$$V = L \cdot \frac{di}{dt}, \quad i = \frac{1}{L} \int v \cdot dt$$



$$v_{out} = 5(1 - e^{-t/\tau})$$



1)