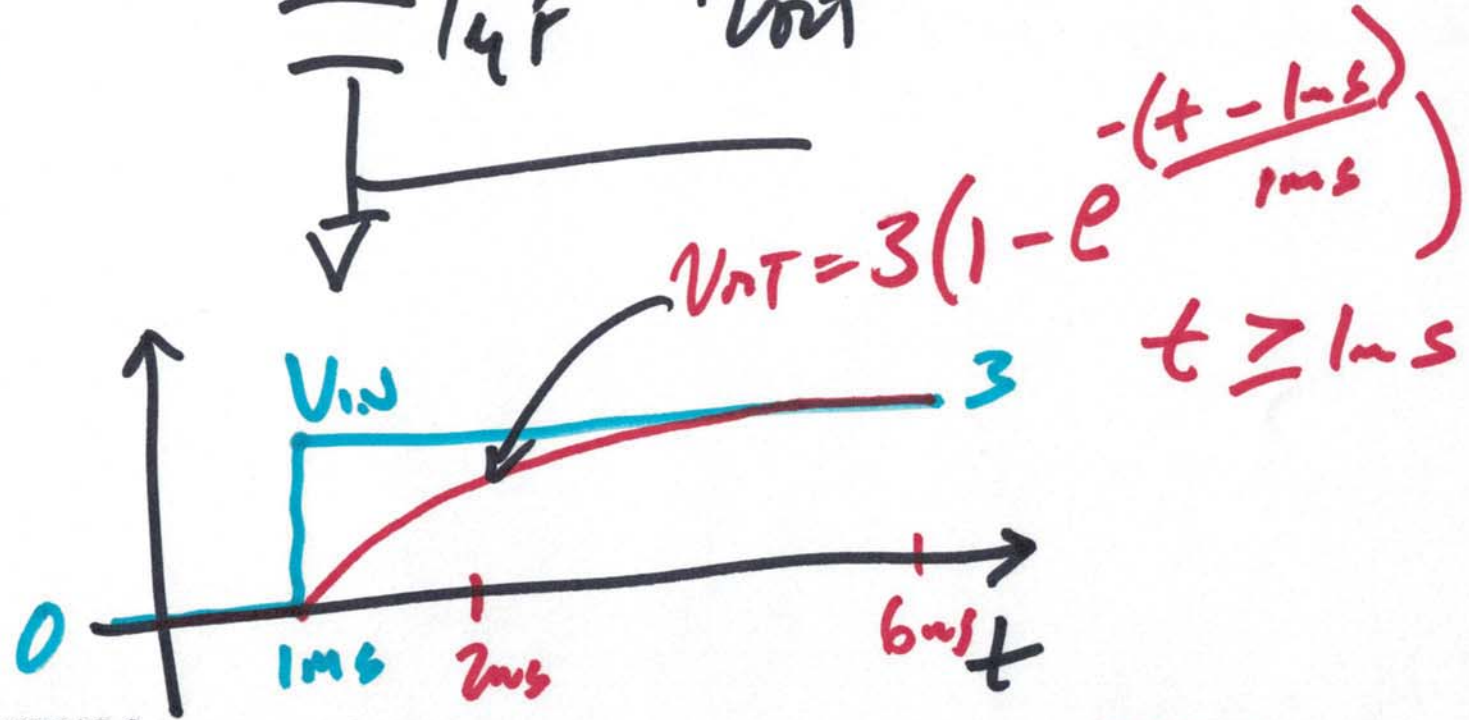
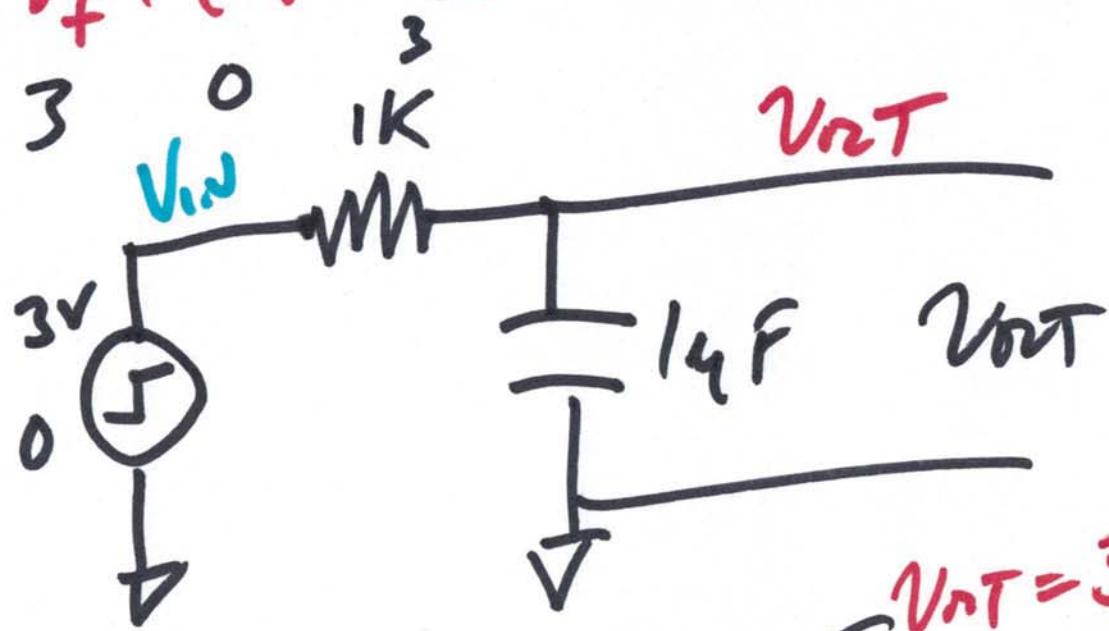


Extra lecture

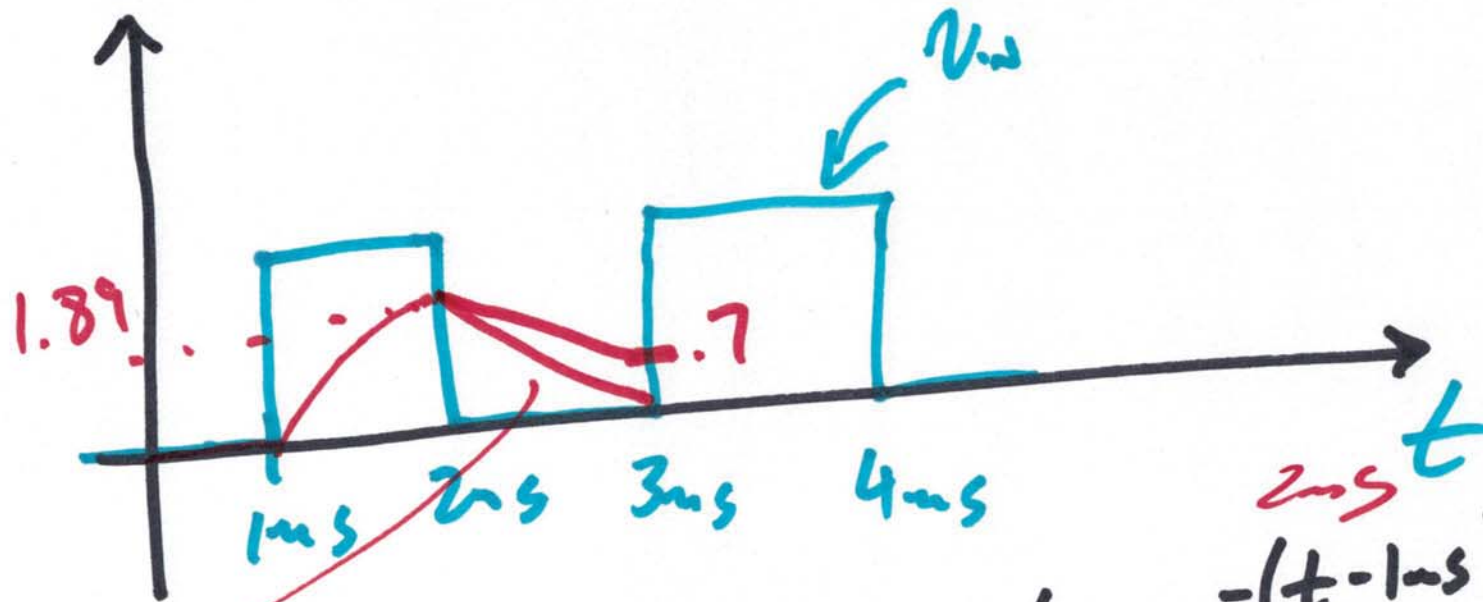
MARCH 30, 2020

$$V_{out} = V_f + (v_i - V_f)e^{-t/RC}$$

$$RC = 10^3 \cdot 10^{-6} = 10^{-3} = 1 \mu s$$



1)



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

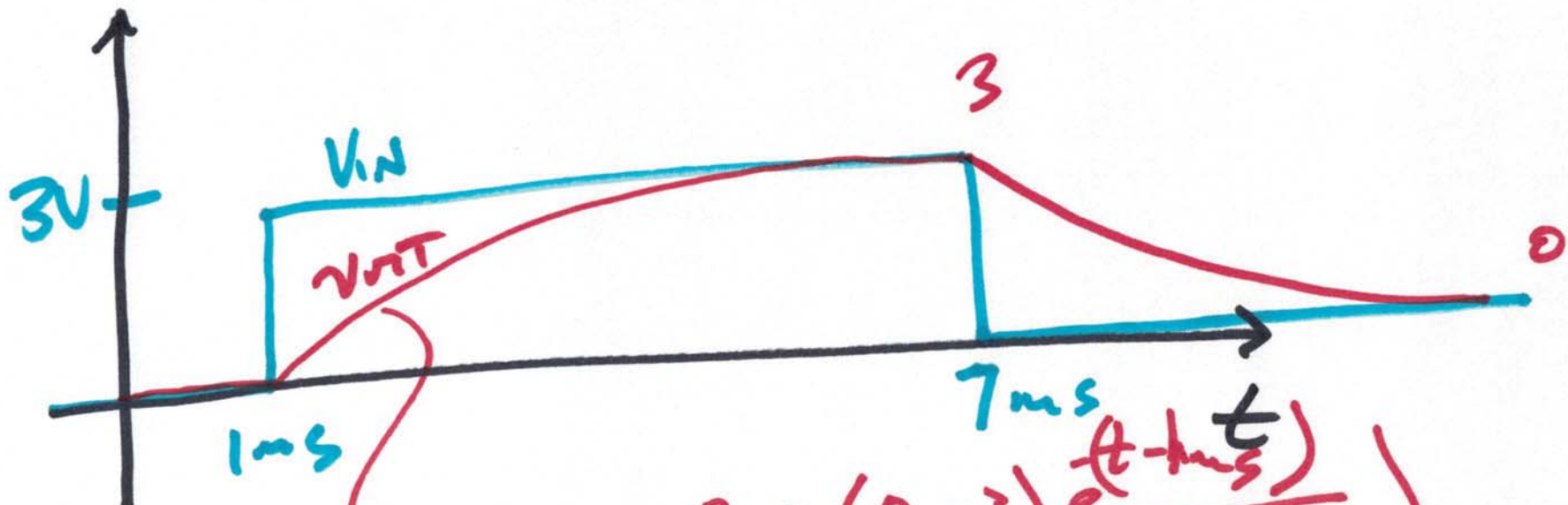
$$v_{OUT} = 0 + (1.89 - 0)e^{-(t-2ms)/1ms}$$

$$1ms \leq t \leq 2ms$$

$$2ms \leq t \leq 3ms$$

$$v_{OUT} = 3(1 - e^{-0.63}) = 1.89$$

$$v_{OUT} = 1.89 e^{-0.37} = 0.7$$



$$v_{OUT} = 3 + (0 - 3) e^{-\frac{(t - 1\text{ms})}{1\text{ms}}}$$

$$t \geq 1\text{ms} \quad 1\text{ms} \leq t \leq 7\text{ms}$$

$$t \leq 7\text{ms}$$

$$v_{OUT} = 0 + (3 - 0) e^{-\frac{(t - 7\text{ms})}{1\text{ms}}}$$

$$7\text{ms} \leq t$$

2)

$$3\mu s \leq t \leq 4\mu s$$

$$V_{out} = 3 + (0.7 - 3)e^{-\frac{(t-3\mu s)}{1\mu s}}$$
$$= 3 + (0.7 - 3)e^{-1}$$

.37

-4.3

~~$V_{out} = 3.41$~~

$$3 + (0.7 - 3) \cdot .37 \quad \text{---} \quad @ t = 4\mu s$$

$V_{out} = 2.15V$

4)