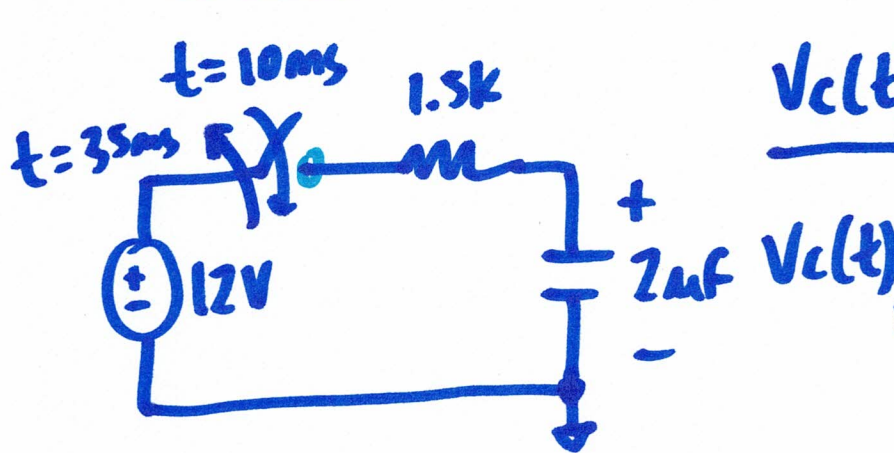


EE 220: Circuits I

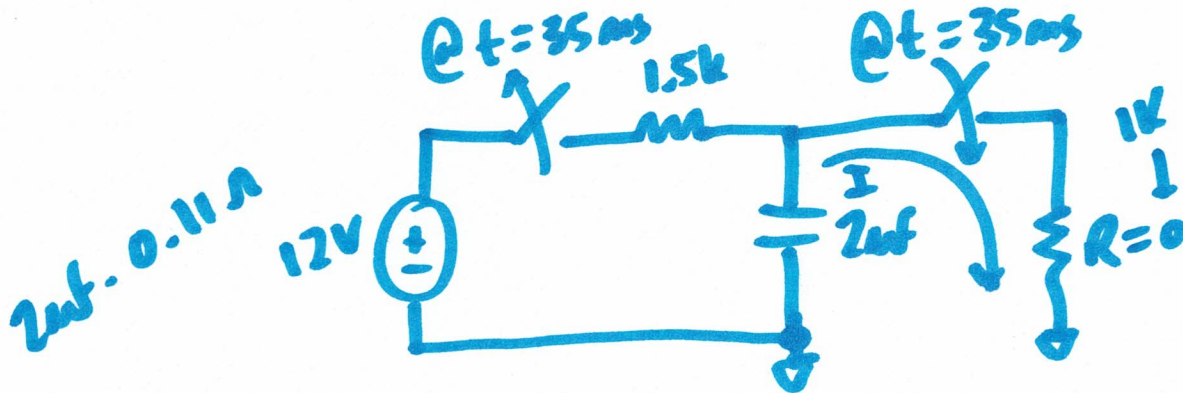
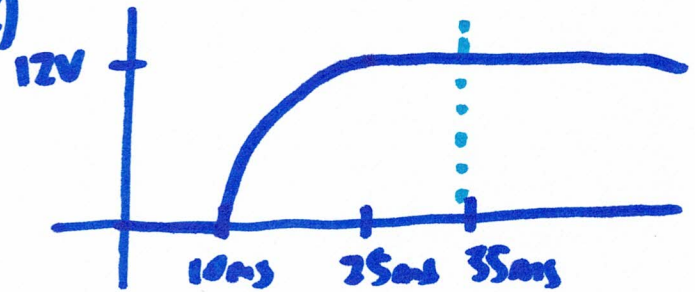
$$I = q \cdot \frac{dV_c}{dt}$$

$$\frac{dV_c}{dt} = \frac{I}{C}$$



$$V_c(t) = 12V(1 - e^{-(t-10ms)/3ms})$$

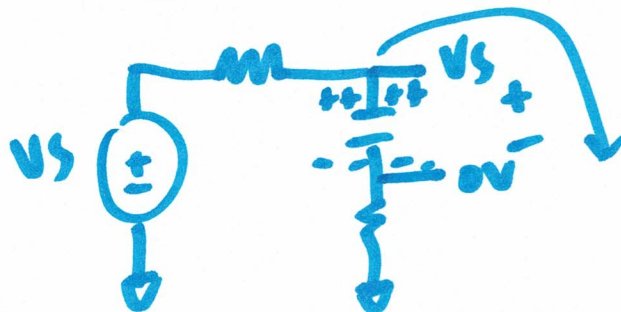
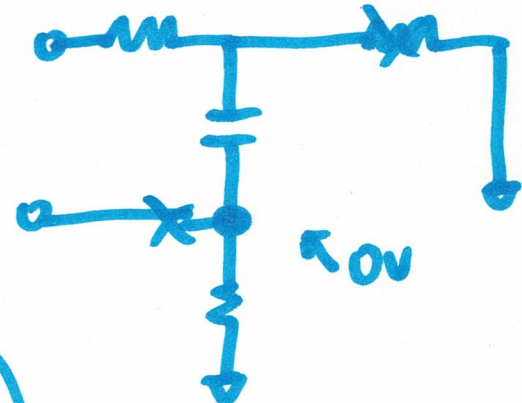
$$\tau = 2\mu F \cdot 1.5k = 3ms$$



$$2\mu F \cdot 0.1A$$

$$R_{sw} = 0.1\Omega$$

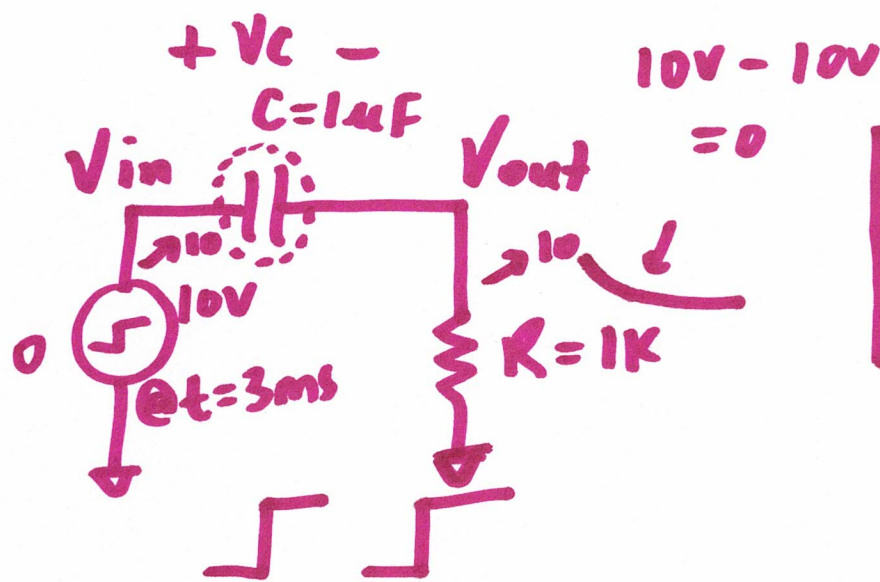
$$R_w = 0.01\Omega$$



$$I = \frac{12V - 0V}{0}$$

$V_{Ci} = 0V$

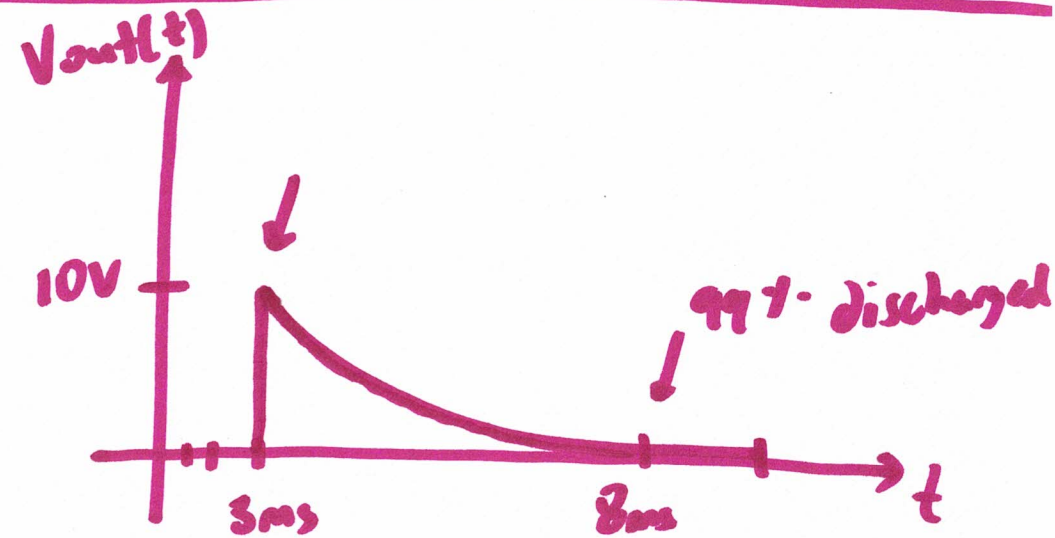
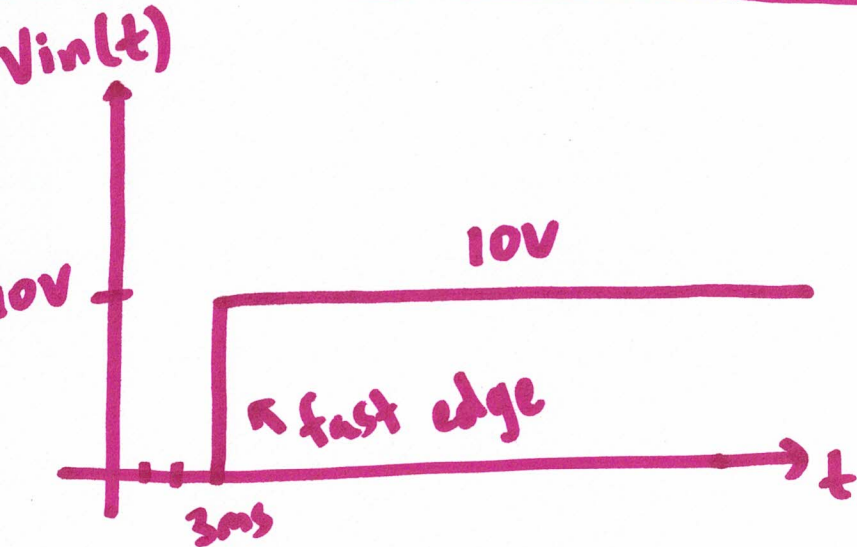
$\tau = 1ms$



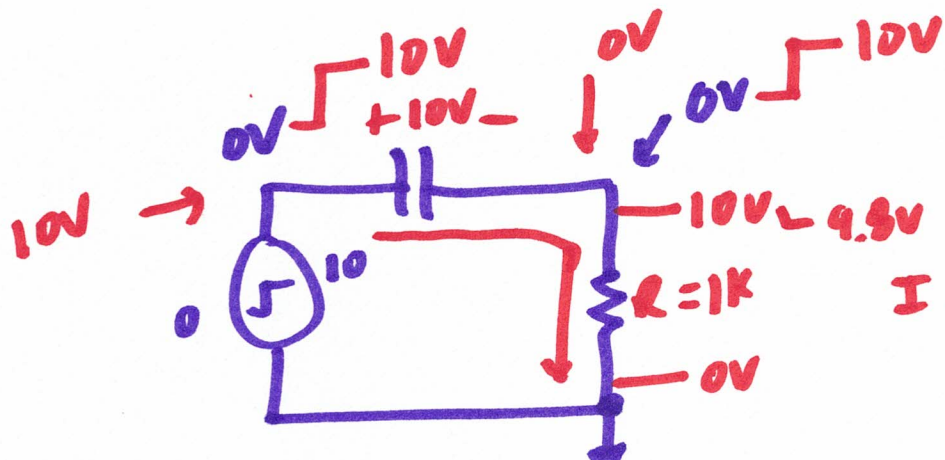
$$I = C \cdot \frac{dV_C}{dt}$$

$$C \cdot V = Q$$

* The voltage across a cap. cannot change instantaneously



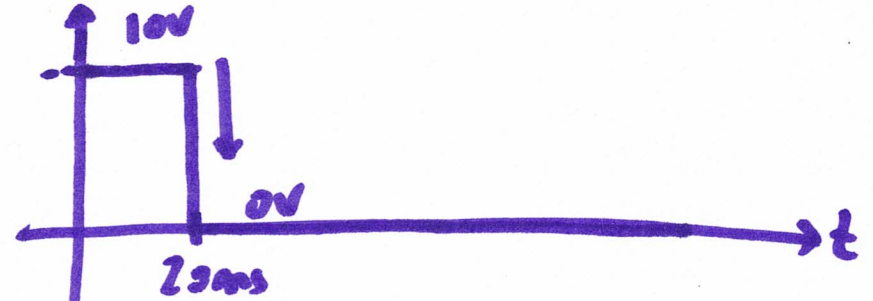
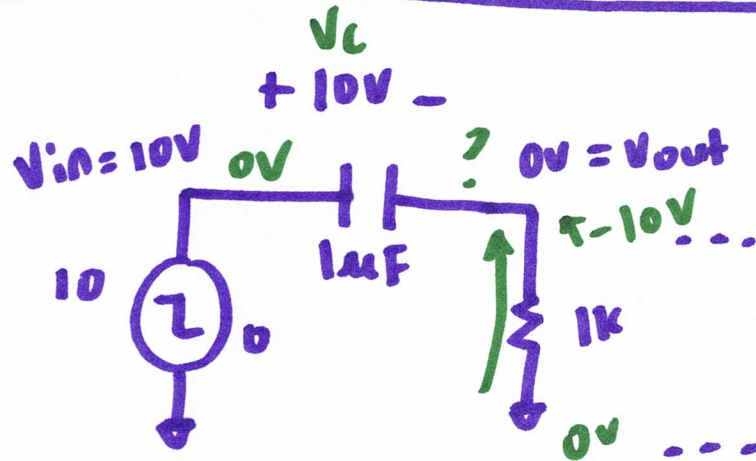
$V_C \approx 10V$



$$I = \frac{10\text{mA}}{C} = \frac{C}{C} \frac{dV}{dt}$$

$$\frac{10\text{mA}}{1\mu\text{F}} = \frac{dV}{dt}$$

$V_{out}(t)$



$$I = C \frac{dV}{dt}$$