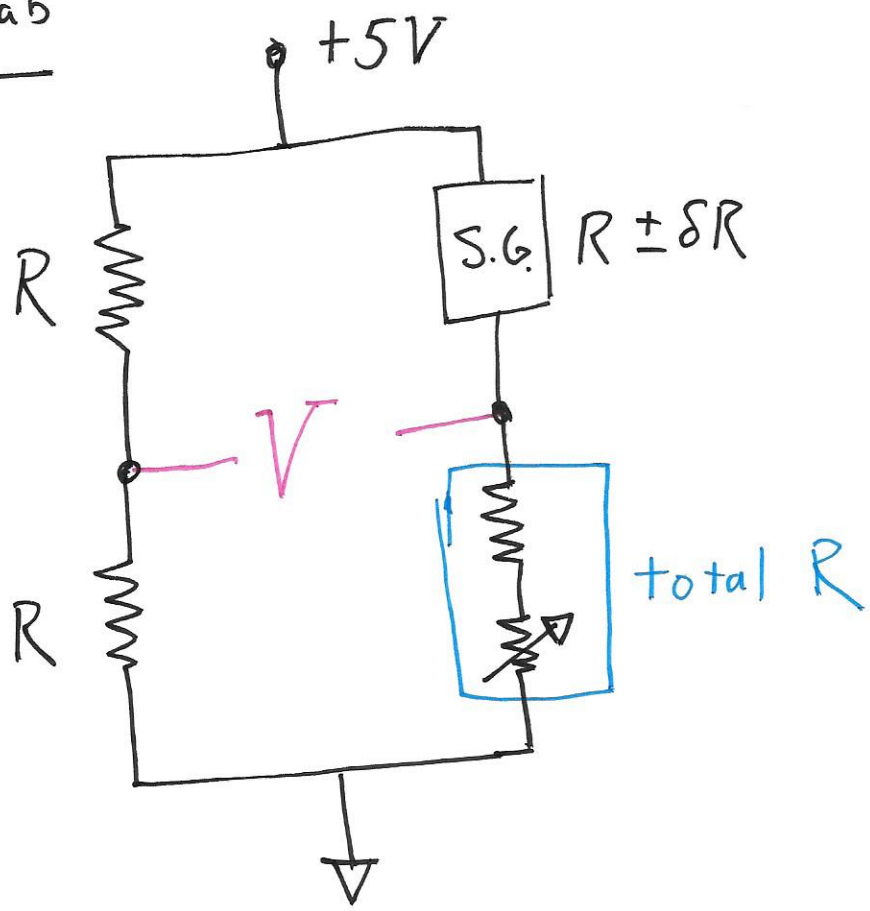
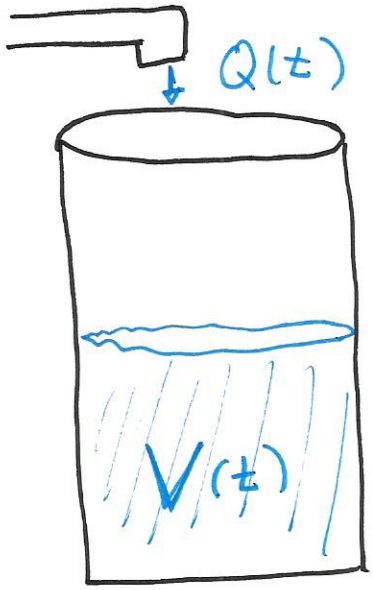
# Review Lab



# Tank




$$V(t) = V(t=0) + \int Q\,dt$$

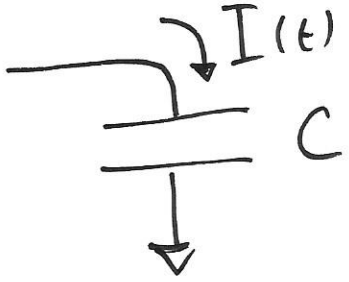
Since Height is like Voltage

$$A\left(H - H(t=0)\right) = \int Q\,dt$$

-OR-

$$A\frac{dH}{dt} = Q$$

# Capacitor



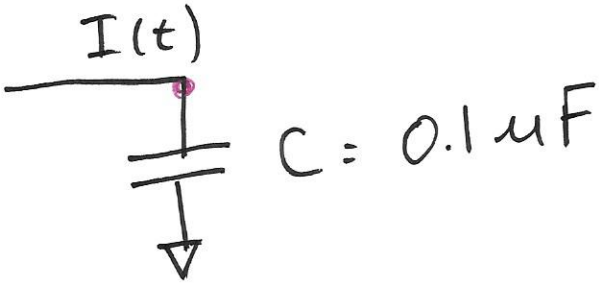

$$C(V - V(t=0)) = \int I(t)$$

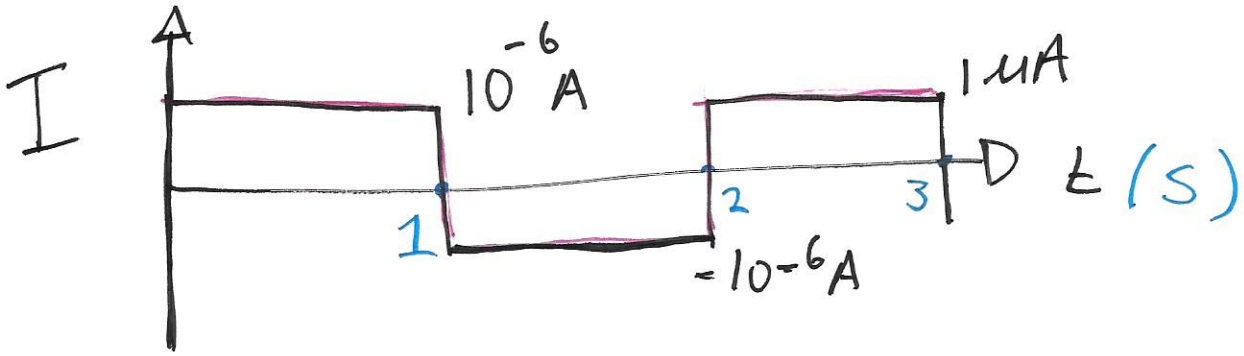
- or -

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

Let's prove it experimentally

# #1

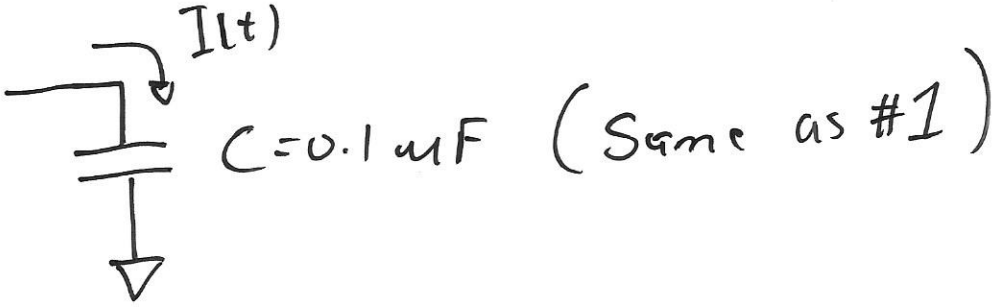


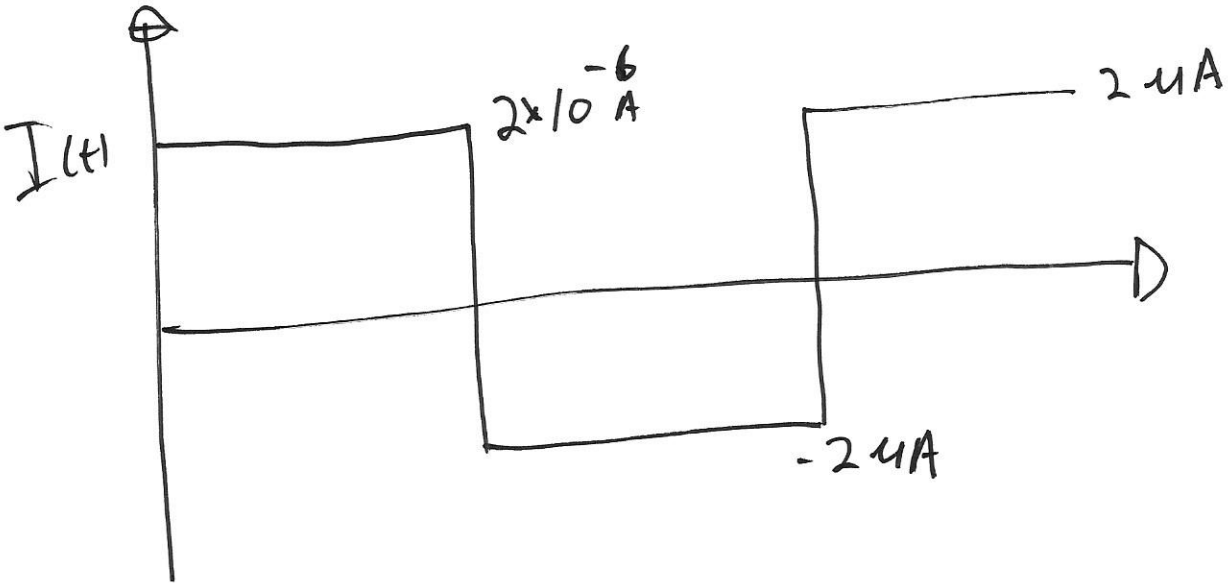




Sketch $V(t)$ (Voltage across Capacitor)

**WITH UNITS!**

#2

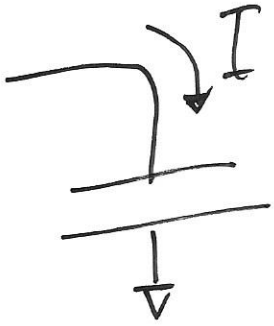


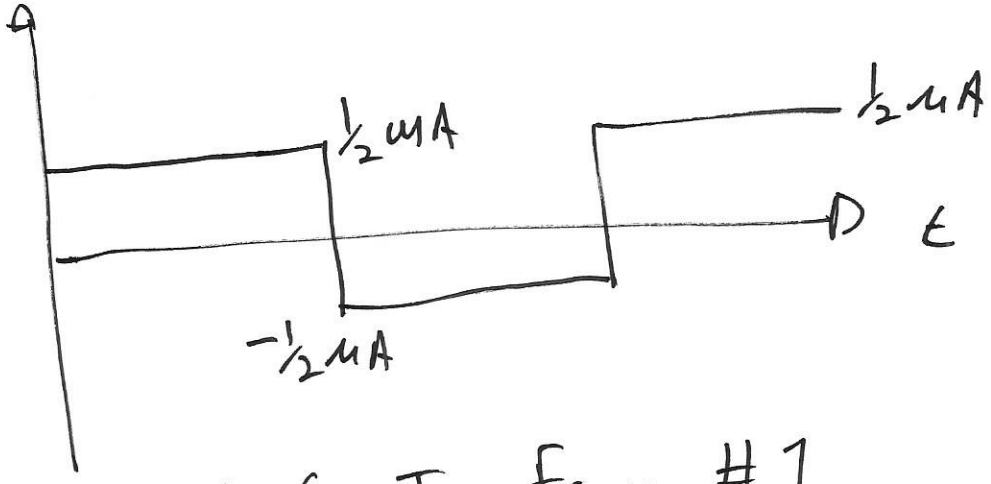

Double I from #1

Sketch V(t)

#3



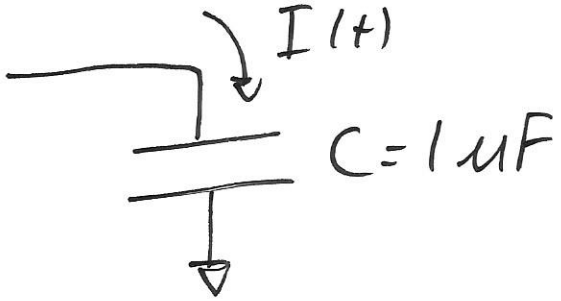

C = 0.1 μF (Same)

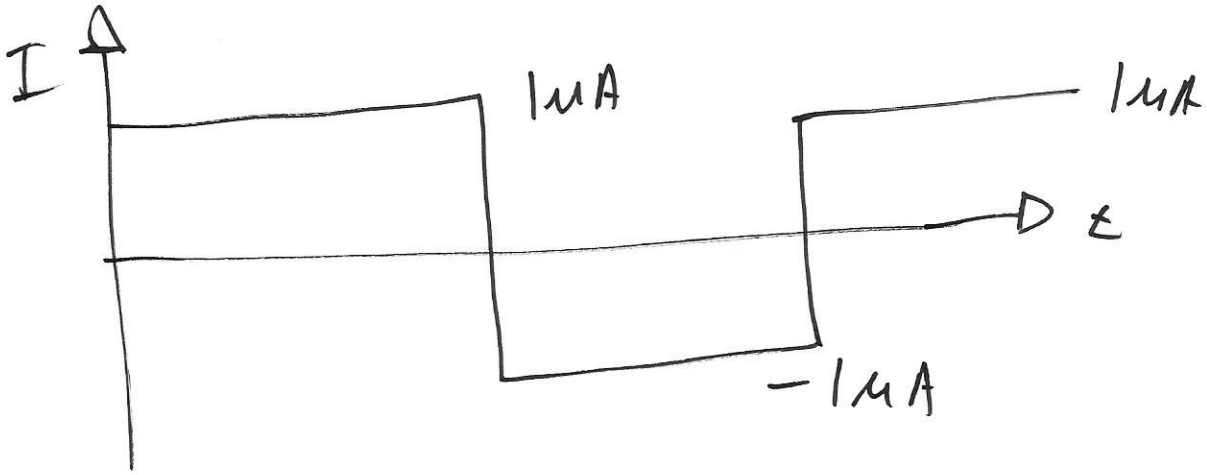



Half I from #1

Sketch V(t)

#4

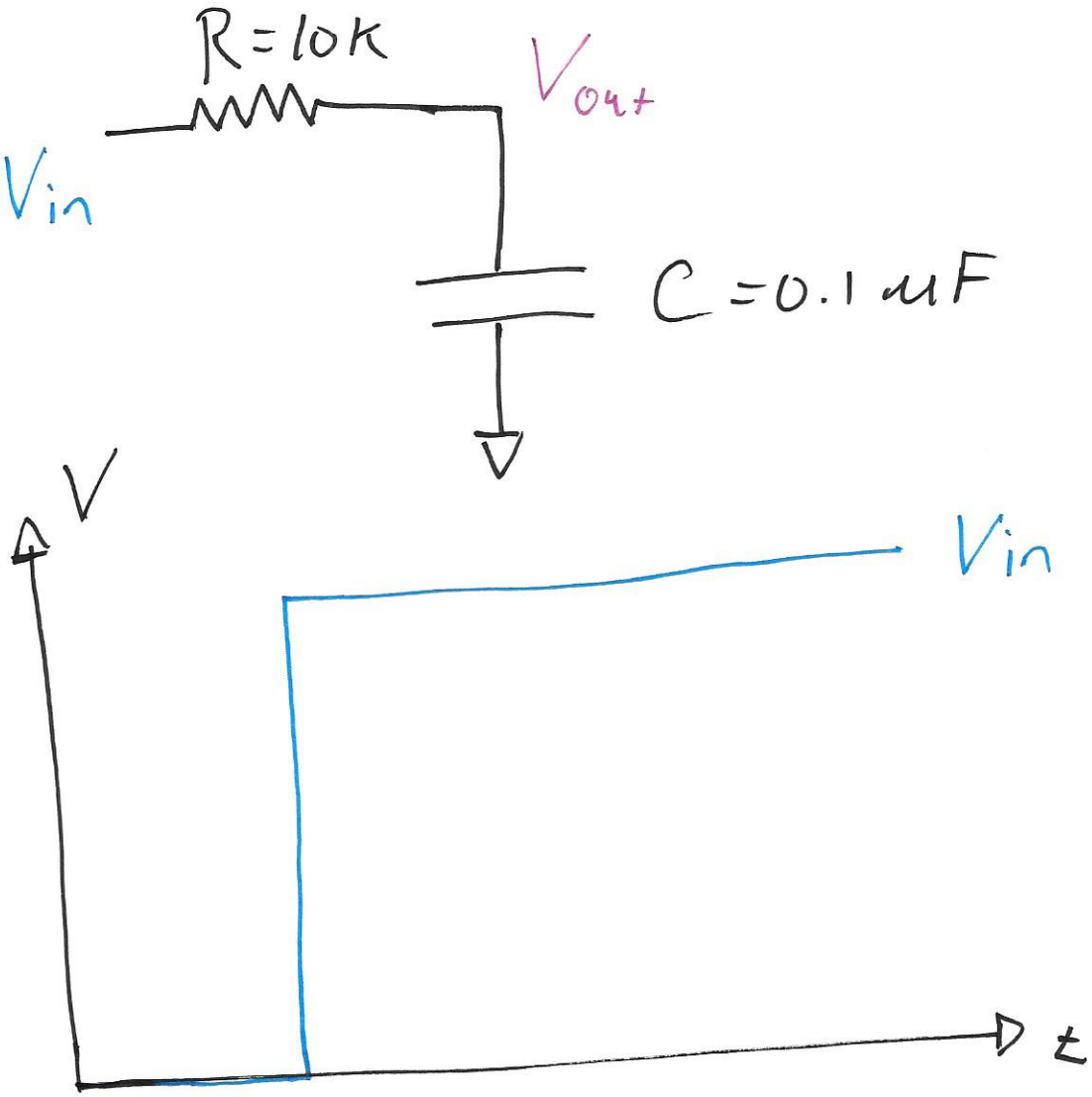



C = 1μF  10X  #1

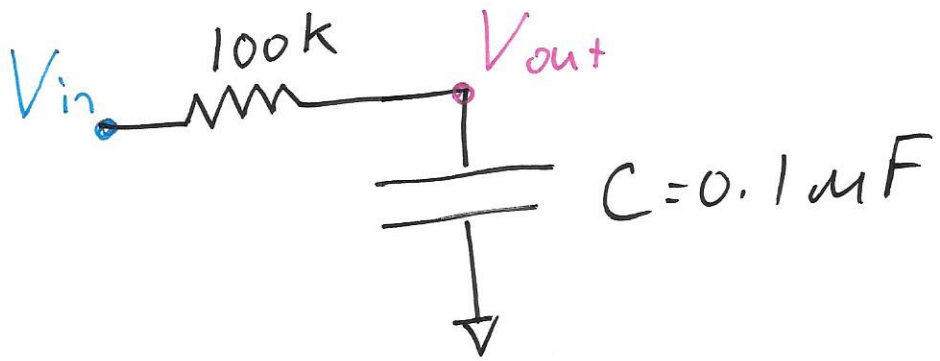
Sketch V(t)

#5




Sketch $V_{out}$ with Units

#6




Sketch $V_{out}$ for same $V_{in}$ as previous - on <u>SAME</u> plot