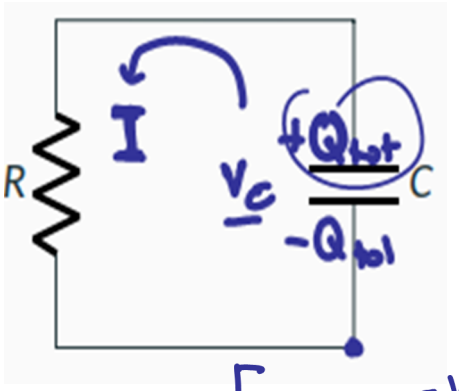

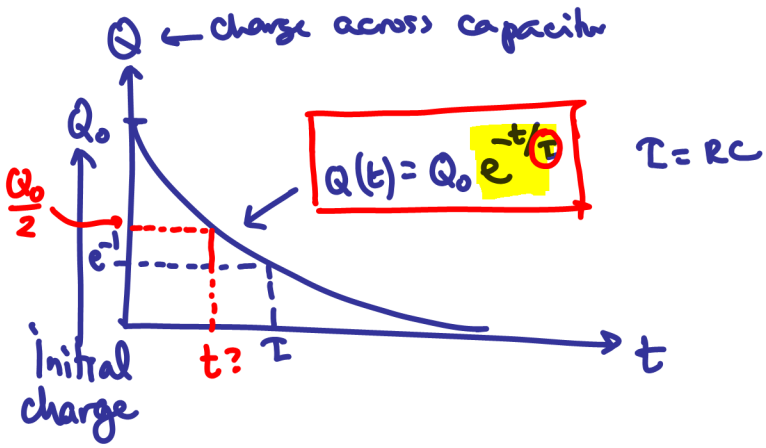

- What is the charge across the capacitor after τ ($t = RC$)?

$$Q = Q_0 e^{-1} = \underbrace{0.3678}_{e^{-1}} Q_0 \rightarrow 36.8\% \text{ of original charge}$$

How long will it take to discharge half the charges on the capacitor plate?

$$\frac{Q_0}{2} = Q_0 e^{-t/\tau} \qquad e^{-t/\tau} = \frac{1}{2} \rightarrow \frac{-t}{\tau} = \ln\left(\frac{1}{2}\right)$$

$$t = -\tau \ln\left(\frac{1}{2}\right) = \underline{0.693\tau}$$