# RC Circuit

$\tau$ = time constant, amount of time for $q$ to reach $63.2\%$ of $\varepsilon C$

$q_{\max} = \varepsilon C$

$i_{\max} = \dfrac{\varepsilon}{R}$

$\tau = RC$

# Equations

$q = Q_0 e^{-t/\tau}$

$i = \dfrac{\varepsilon}{R} e^{-t/\tau}$

$i = -\dfrac{Q_0}{\tau} e^{-t/\tau}$

$i = I_0 e^{-t/\tau}$

$V = V_0 e^{-t/\tau}$

$I = \dfrac{V_0}{R} e^{-t/RC}$

## Charging

$q = \varepsilon C\left(1 - e^{-t/\tau}\right)$

## Discharging

$q = \varepsilon C e^{-t/\tau}$