RC Circuit

τ = time constant, amount of time for q to reach 63.2% of εC

$q_{\max} = \varepsilon C$

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

$\tau = RC$

Charging

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

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

Discharging

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

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