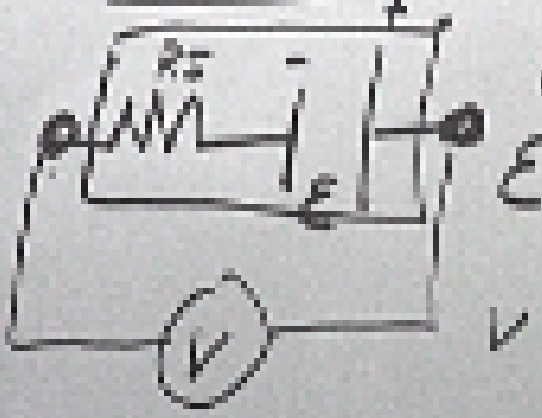
(230)

$V = \frac{\Delta U}{Q} \Rightarrow \Delta U = Q V \ [W]$

$P = \frac{\Delta U}{\Delta t} = V \frac{\Delta Q}{\Delta t} = V I$

$V = IR \Rightarrow P = I^2 R = \frac{V^2}{R}$

$\boxed{P = I^2 R}$ —

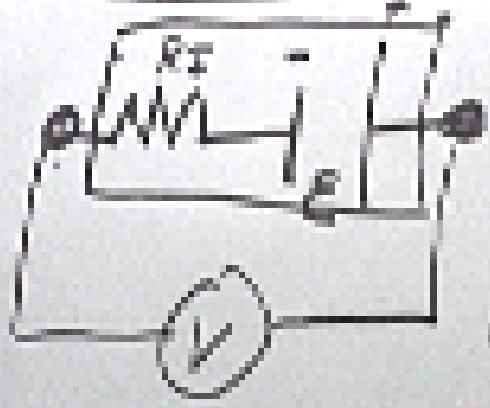


$V = \frac{U}{Q} \Rightarrow U = QV \ [V]$

$P = \frac{\Delta U}{\Delta t} = V\frac{\Delta Q}{\Delta t} = VI$

$V = IR \Rightarrow P = I^2R = \frac{V^2}{R}$

$\boxed{P = I^2R}$ —



Emf

terminal

emf terminal

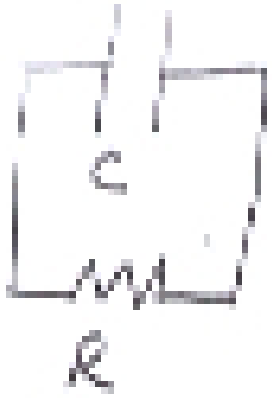
$V = IR$

$\mathcal{E} - IR - IR_I = 0$

$\mathcal{E} - IV = IR_I$

$R_I = \frac{\mathcal{E} - IR}{I} = \frac{\mathcal{E}}{I} - R$

$\boxed{V = \mathcal{E} - IR_I}$



$V_C + V_R = 0$

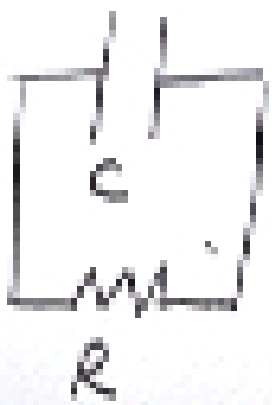
$C = \frac{Q}{V} \Rightarrow V_C = \frac{Q}{C}$

$V = IR$

$\frac{Q}{C} + IR = 0$

$Q = -I(RC) = -\frac{dQ}{dt}(RC)$

$RC = \frac{V}{A} \cdot \frac{C}{V} = \frac{C}{A} = \frac{C}{(\%)} = \$ S$



$$V_C + V_R = 0$$

$$C = \frac{Q}{V} \Rightarrow V_C = \frac{Q}{C}$$

$$V = IR$$

$$\frac{Q}{C} + IR = 0$$

$$Q = -I(RC) = -\frac{\Delta Q}{\Delta t}(RC)$$

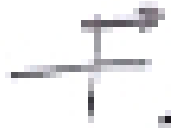
$$RC = \frac{V}{A}\cdot\frac{C}{V} = \frac{C}{A} = \frac{C}{(\%)} = \%\,s$$

$$V_c + V_R = 0$$

$$C = \frac{Q}{V} \Rightarrow V_c = \frac{Q}{C}$$

$$V = IR$$

$$\frac{Q}{C} + IR = 0$$



$$\tau = RC$$

$$Q = -\frac{dQ}{dt}\tau \qquad C = \frac{Q}{V}$$

$$\frac{dt}{\tau} = -\frac{dQ}{Q} = -\ln\left(\frac{Q}{Q_0}\right) = \frac{t}{\tau}$$

$$\ln\left(\frac{Q}{Q_0}\right) = -\frac{t}{\tau}$$

$$\frac{Q}{Q_0} = e^{-t/\tau} \Rightarrow \boxed{Q = Q_0 e^{-t/\tau}}$$

$$I = Q_0\left(\frac{-1}{\tau}\right)e^{-t/\tau}$$

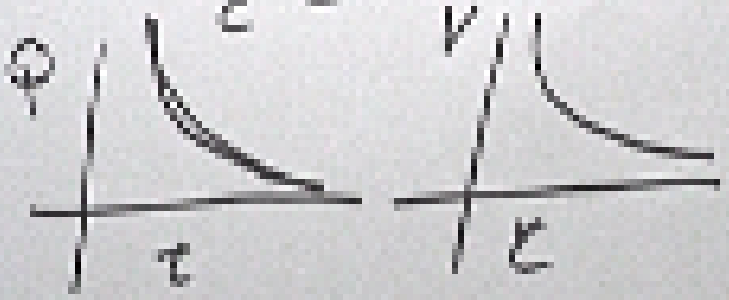
$$V = \frac{Q_0}{C}e^{-t/\tau}$$

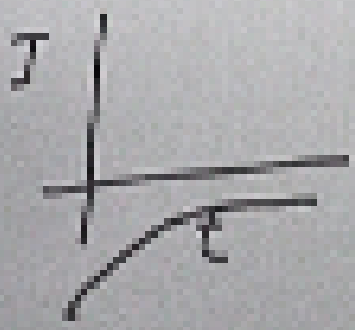
$$q = q_0 e^{-t/\tau}$$

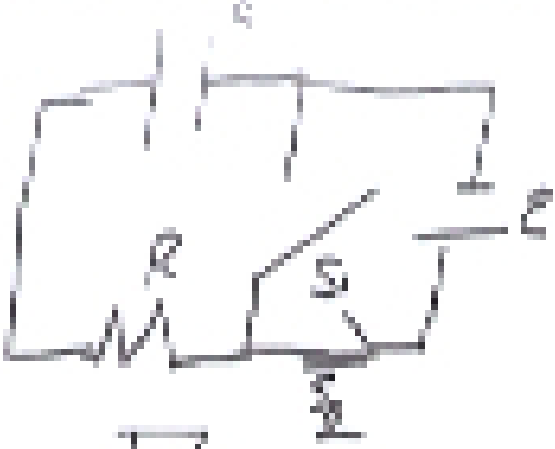
$$q = -I\tau \Rightarrow I = -\frac{q}{\tau} = -\frac{q_0 e^{-t/\tau}}{\tau}$$

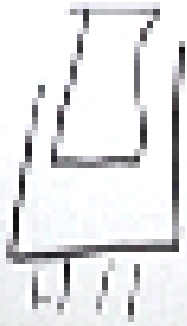
$$q + IR = 0$$

$$V = \frac{q_0}{C} e^{-t/\tau}$$



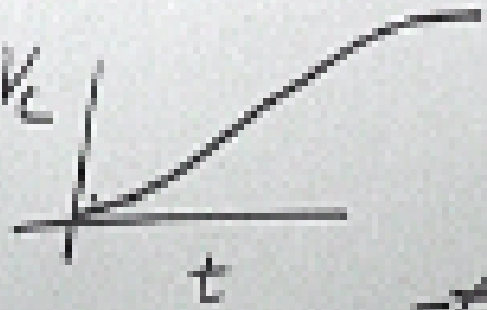






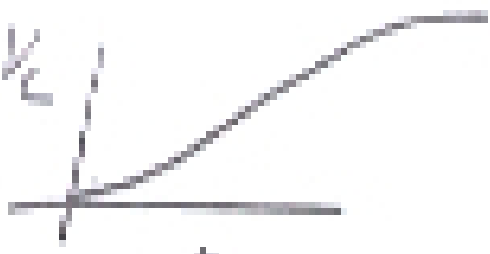
$$V_c = \varepsilon - \frac{Q}{C} e^{-t/RC}$$

$$= \varepsilon (1 - e^{-t/(RC)})$$



$C = \frac{Q}{V} \Rightarrow Q = C\varepsilon(1 - e^{-t/RC})$

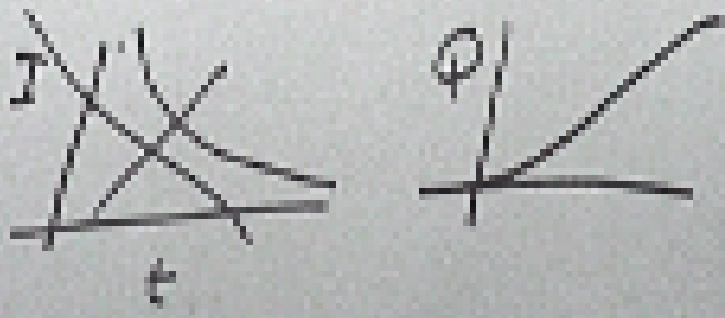
$= \varepsilon(1 - e^{-t/\tau})$

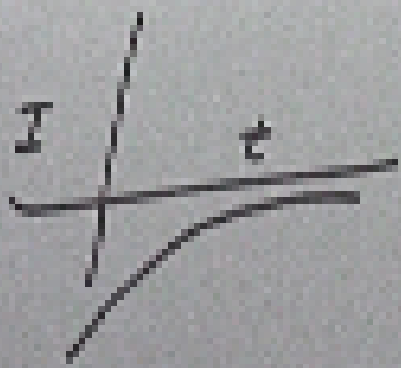


$C = \frac{Q}{V} \Rightarrow Q = C\varepsilon(1 - e^{-t/\tau})$

$I = \frac{dQ}{dt}$

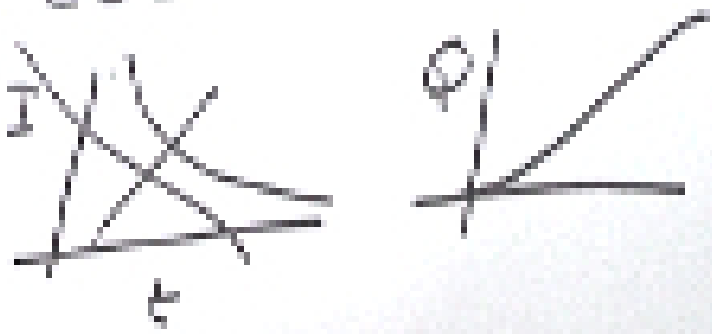
$I = -C\varepsilon e^{-t/\tau}$

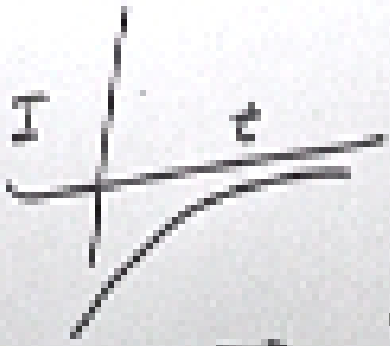




$$I = \mathcal{E} \frac{\Delta \varphi}{\Delta t} \quad -\varphi_0$$

$$I = -CE\mathcal{E}$$





$V = IR$

$I \quad \square\square \vec{Q}_A \quad \vec{J} \frac{[A]}{m^2}$

$$I = \vec{J} \cdot \vec{A} \rightarrow \vec{J} = \sigma \vec{E}$$

σ

(1)

$$P_1 = I^2 R_1 = (.1)^2 \cdot 10 = .1\ W$$

$$P_2 = I^2 R_2 = (.1)^2 \cdot 100 = 1\ W$$

$$P = P_1 + P_2 = 1.1\ W$$

(2)

$I = .125A$

$$\varepsilon - IR_2 - IR = 0$$

$$\varepsilon - IR = IR_2$$

$$R_2 = \frac{\varepsilon}{I} - R = \frac{1.5V}{.125A} - 10$$

$$R_2 = 2\Omega$$