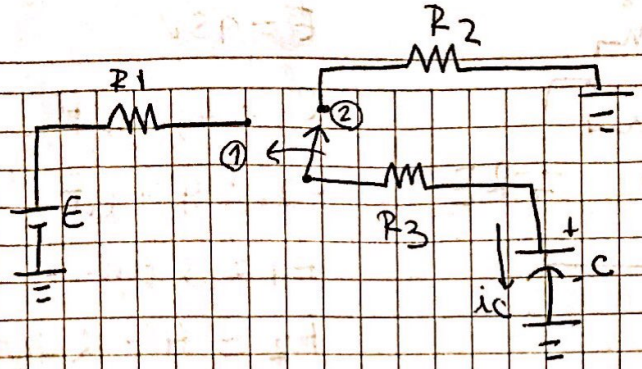
③ b)

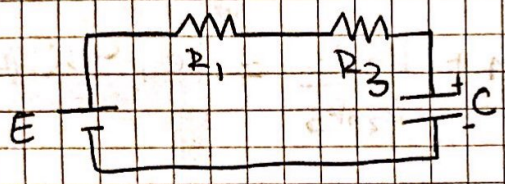


$R_1 = 10k\Omega$

R_2

$R_3 = 15k\Omega$

- cuando la llave está en ①:



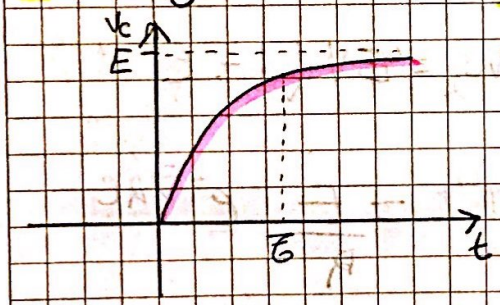
$$E = \frac{dQ}{dt} R_{eq} + \frac{Q}{C} \quad (Q(0) = 0)$$

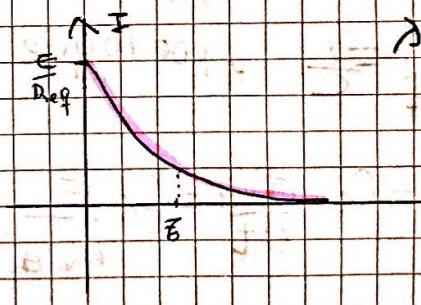
I
C inicialmente descargado

$R_{eq} = R_1 + R_3$

$$\Rightarrow Q = CE\left[1 - e^{(-t/R_{eq}\cdot C)}\right]$$

$$\left[V_C = \frac{Q}{C} = E\left[1 - e^{-\frac{t}{R_{eq}}}\right]\right] \quad , \quad \left[I = \frac{dQ}{dt} = \frac{E}{R_{eq}} \cdot e^{-t/R_{eq}\cdot C}\right]$$

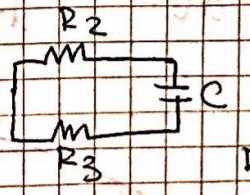




↗ se carga C hasta cargarse por completo, cuando ya no circula I

$\tau = R_{eq} \cdot C = 25k\Omega \cdot C$

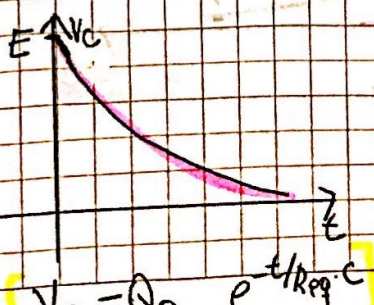
- Luego la llave pasa a ②:

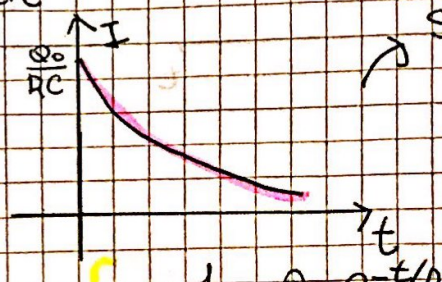


$R_{eq} = R_2 + R_3$

$Q(0) = E$ (capacitor inicialmente cargado)

$$\frac{Q}{C} = IR \quad , \quad I = \frac{dQ}{dt} \quad \Rightarrow Q = Q_0 \cdot e^{-t/R_{eq}\cdot C}$$





↗ se descarga C

$$\left[V_C = \frac{Q_0}{C} \cdot e^{-t/R_{eq}\cdot C}\right] \qquad \left[I = \frac{1}{R_{eq}C} \cdot Q_0 \cdot e^{-t/R_{eq}C}\right]$$