

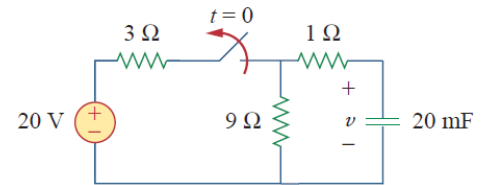
Fondamental Electricity

Tutorial N°2 (Transient regime)

Exercise 1: The Source-Free RC Circuit

The switch in the circuit in the following figure has been closed for a long time, and it is opened at $t = 0$

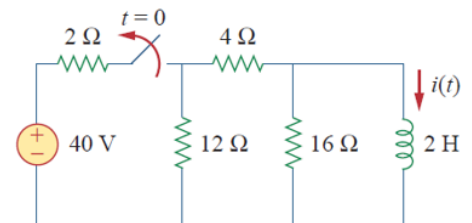
- Find $v(t)$ for $t \geq 0$
- Calculate the initial energy stored in the capacitor.



Exercise 2: The Source-Free RL Circuit

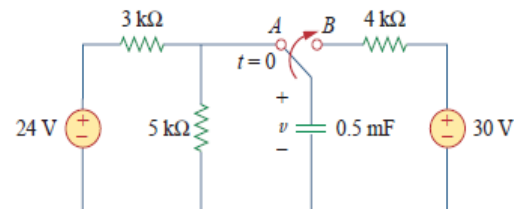
The switch in the circuit followin Figure has been closed for a long time at $t = 0$, the switch is opened

- Calculate $i(t)$ for $t > 0$



Exercise 3: Step Response of an RC Circuit

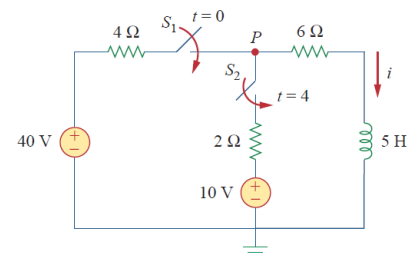
The switch in the following figure has been in position A for a long time. At $t = 0$ the switch moves to B. Determine $v(t)$ for $t > 0$ and calculate its value at $t = 2s$ and $4s$.



Exercise 4: Step Response of an RL Circuit

At $t = 0$ switch 1 in following figure is closed, and switch 2 is closed 4 s later.

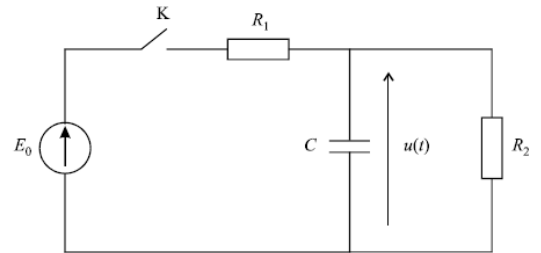
- Find $i(t)$ for $t > 0$.
- Calculate i for $t = 2s$ and $t = 5s$.



SUPPLEMENTARY EXERCISES

Exercise 4. Transient behaviour in a circuit comprising a capacitor and two resistors

In the circuit shown in following Figure, switch K is closed at $t = 0$. Determine the expression for $u(t)$ and plot its graph. The capacitor is assumed to be discharged when the switch is closed.



Exercise 5. Transient behaviour in a circuit comprising a coil and resistors

Find $i(t)$ in the circuit of following Figure for $t > 0$, Assume that the switch has been closed for a long time.

