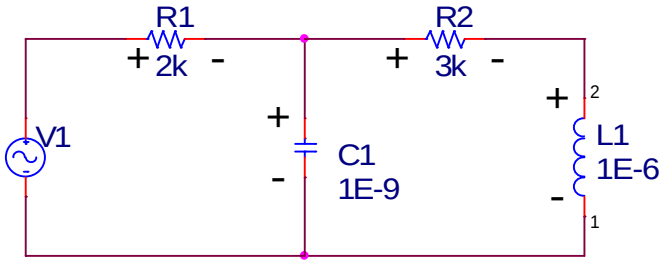
Voltage/Current continuity

1) In the circuit below, the voltage source is defined as follows:

$$Vs = \begin{cases} 0 & t < 0 \\ 10V & 0 < t \end{cases}$$ (the voltage source turns on at t = 0)



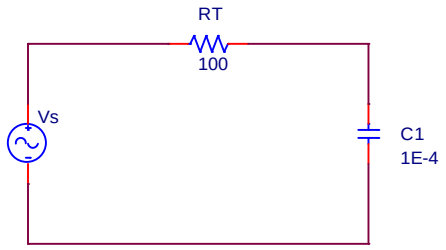
a. What are the initial conditions for the circuit?

b. Determine the mathematical expression for the source.

c. At t = 0^+ , (just after the voltage source turns on), for the polarities indiated in the circuit, determine the voltage acorss each component and the current through each component.

d. At t goes to ∞, the polarities indicated in the circut, determine the voltage across each component and the current through each component.

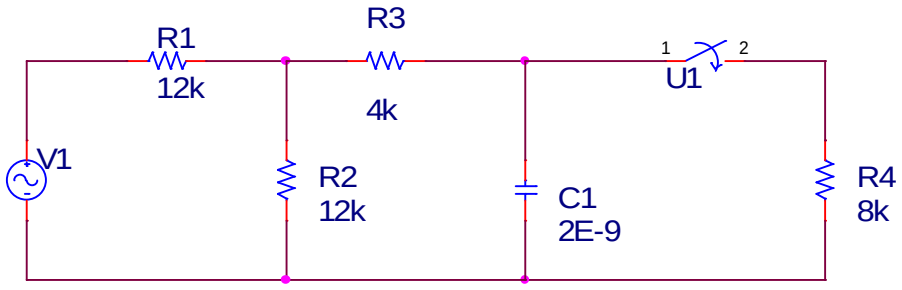
2) RC series circuit



a) Exponential source input

$$v_s(t) = 5e^{-50t}u(t)$$

3) Circuit Analysis and Thevenin/Norton Circuits



In the above circuit,
1.The voltage source turns on at t=0 with a voltage of 20V
2. Switch U1 closes at 15E-6s
3. The voltage source turns off at t = 25E-6

a. Determine the voltage across C1 as a function of time for t>0.

For 0<t<15E-6

For 15E-6s<t<25E-6

For t>25E-6