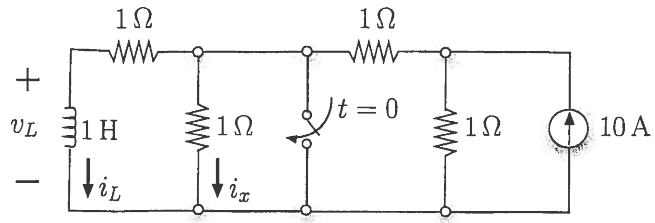
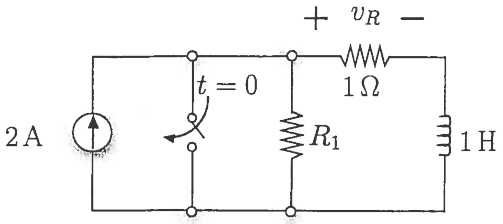
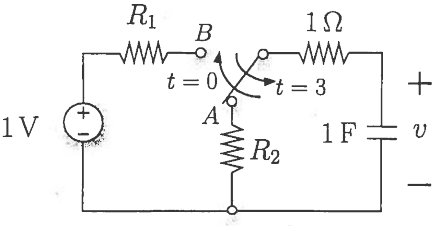
2. Assume the switch has been open for a long time and it closes at time $t = 0\,\text{s}$. Find and sketch $i_L(t)$, $v_L(t)$, and $i_x(t)$.



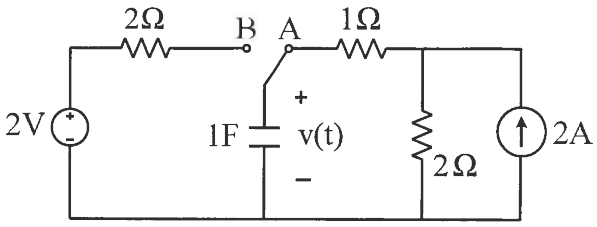
3. Assume the switch has been open for a long time and it closes at time $t = 0\,\text{s}$. Find the value of R_1 such that $v_R(1\,\text{s}) = \frac{1}{2}e^{-1}\,\text{V}$.



4. Assume the switch has been in the A position for a long time, it moves to the B position at time $t = 0\,\text{s}$, and it moves back to the A position at time $t = 3\,\text{s}$. Find the values of R_1 and R_2 such that $v(1\,\text{s}) = 1 - e^{-1/3}\,\text{V}$ and $v(4\,\text{s}) = \left(1 - e^{-1}\right)e^{-1/4}\,\text{V}$.



Problem 5



Assume the switch has been in position A for a long time. It moves to position B at $t = 0$.

a) (5 points) Write the 1st order ODE of v(t) for $t > 0$.

b) (3 points) Find the initial value of v(t) at $t = 0^-$.

$V(0^-) =$_____

c) (8 points) Solve v(t) for $t > 0$.

$v(t) =$_____

d) (3 points) What is the zero input component of v(t)?

$V_{z\text{-}i}(t) =$_____

Problem 5 (cont.)

e) (3 points) What is the zero state component of v(t)?

$V_{z\text{-}s}(t)$=_____