# Homework 8

Due date: 18:00, 23rd, Dec.

Turn in your homework to room 3-305, SIST

Rules:

- Work on your own. Discussion is permissible, but extremely similar submissions will be judged as plagiarism.

- Please show all intermediate steps: a correct solution without an explanation will get zero credit.

- Please submit on time. No late submission will be accepted.

- Please prepare your submission in English only. No Chinese submission will be accepted.
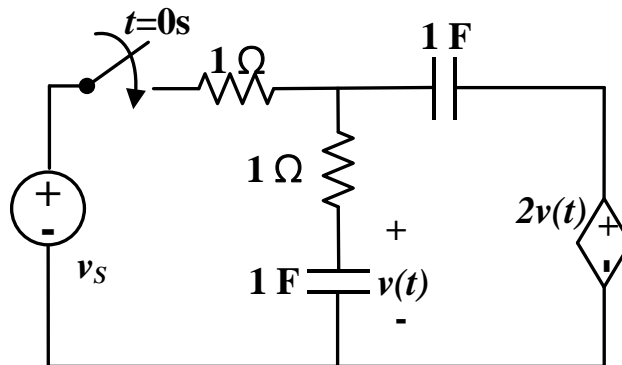
1. For the following circuit, the switch had been at node **a** for a long time before $t=0$s. At $t=0$s, the switch was turned to node **b** immediately. Please find the voltage on the 2Ω resistor for $t>0$s by using **time domain method AND Laplace domain method**, **respectively**.
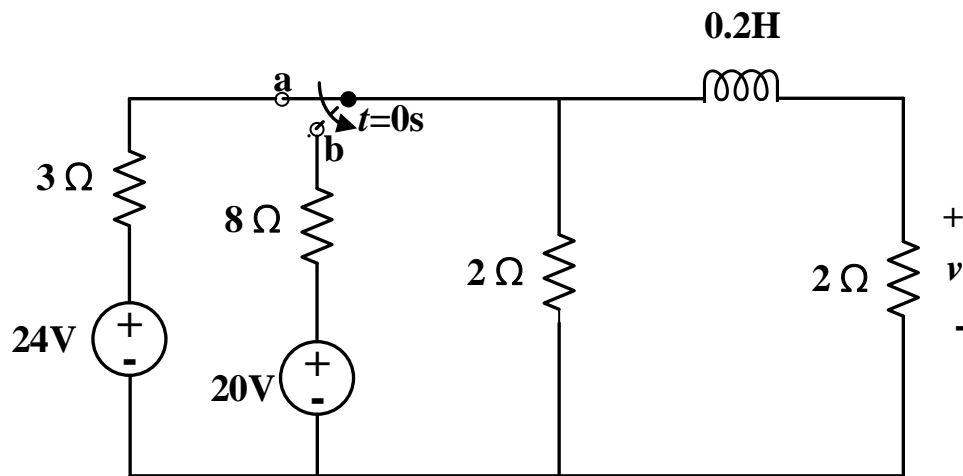
2. For the following circuit, the switch had been at node **a** for a long time before t=0s. When t=0s, the switch was turned to node **b** immediately. Please use **Laplace domain method** to find i_L(t) for t>0s.
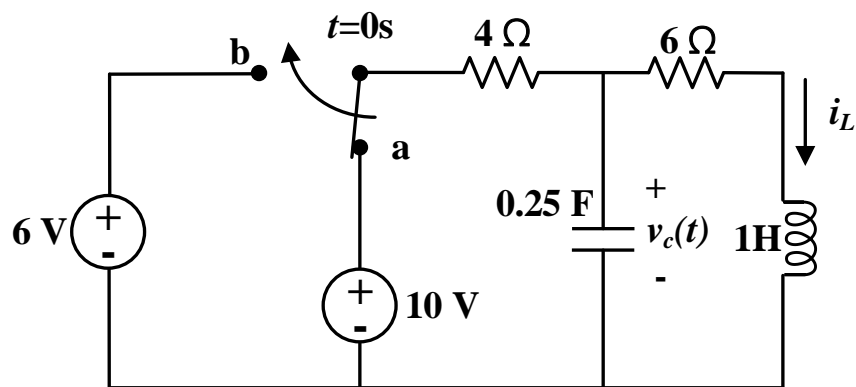
3. For the circuit below, the switch closed immediately at $t=0$s, and $v_S(t)=e^{-t}sin(t)$ V. Please find the voltage $v(t)$ shown in the circuit for t>0s by using **Laplace domain method.** Note that there is no energy stored in this circuit before $t=0$s.

4. For the following circuit, $v_s(t)=10\cos t$ V, and the switch closed immediately at $t=0$s. There is no energy stored in the circuit before $t=0$s. Please
   (a) Use **phasor method** to find the **steady-state** for the voltage of $v(t)$.
   (b) Use **Laplace domain method** to find $v(t)$ for $t>0$s and compare the results from (a).