# Homework 8

Due date: 11:00 pm, Jan. 14th, 2023

Turn in your hard-copy hand-writing homework to Room 324 #3 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.
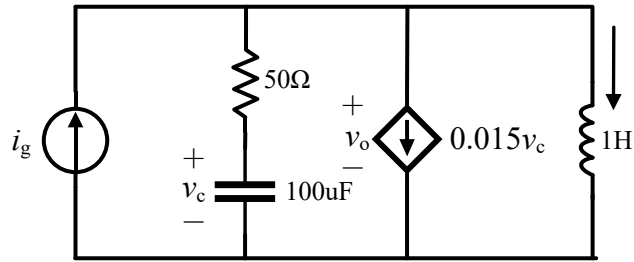
1. Please find the transfer function of v_0/v_i.
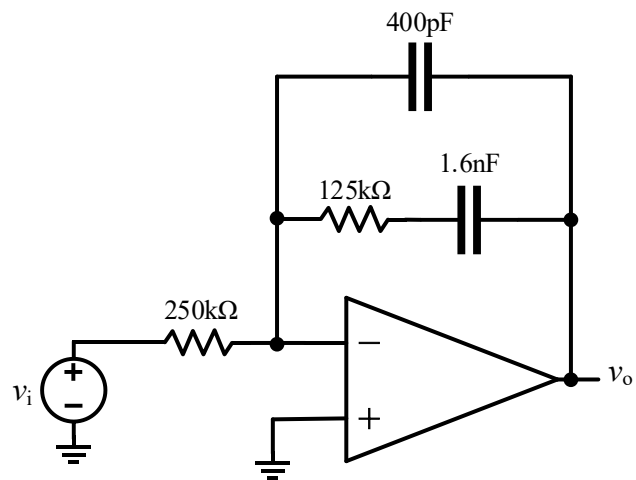
2. For the following circuit, the switch had been at node **1** for a long time before t=0s. When t=0s, the switch was turned to node **2** immediately. If no initial energy was stored for the inductor, please use **Laplace domain method** to find i_L(t) for t>0s.
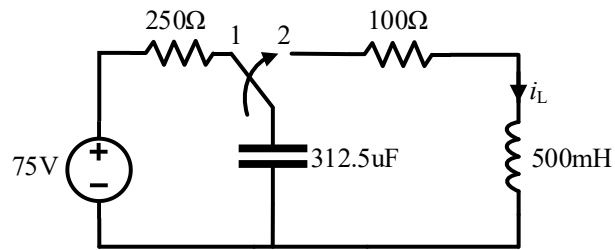
3. Given no initial energy was stored for the energy storage elements, find steady-state response v_c by **Laplace domain method and phasor domain method.**
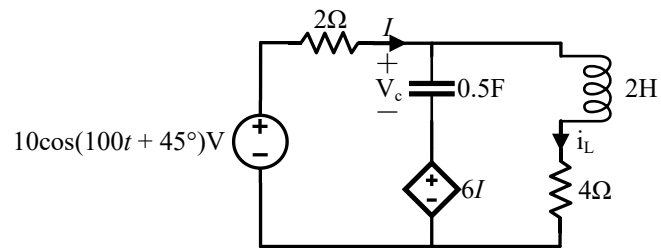
4. When $t=0$, the current through the inductor is 5mA and no initial energy is stored for the capacitor. If $i_g=20u(t)$mA, find $v_o(t)$ for $t>0$ by **Laplace domain method.**

5. For the following circuit, $v_s(t)=10\cos(200t)$ V, and the switch closed immediately at t=0s. There is no energy stored for the inductors before **t=0s**. Please

(a)Use **phasor method** to find the **steady-state** for the voltage of $v(t)$.

(b)Use **Laplace domain method** to find **complete response** of **v(t)** for *t>0* and compare the results from (a).
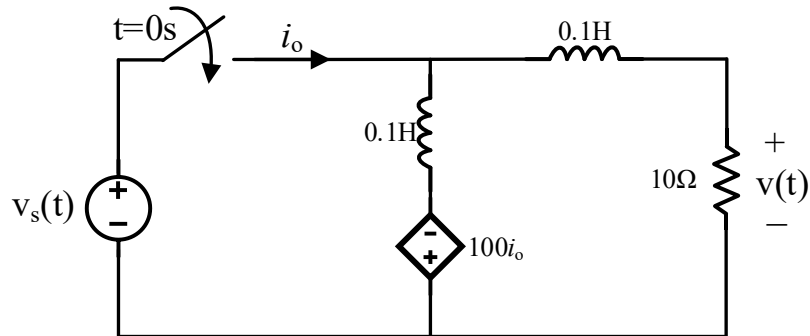
6. For the following circuit, the switch had been at node *a* for a long time before *t*=0s. When *t*=0s, the switch was turned to node *b* immediately. Please use (a) **Laplace domain method and (b) time domain method** to find i_L(t) for *t*>0s.