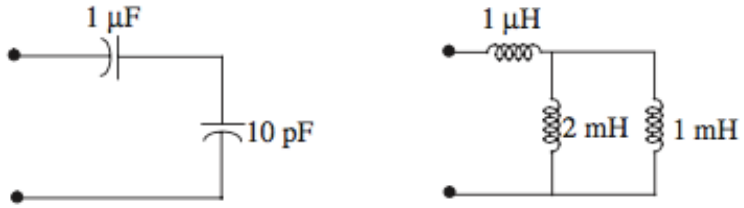
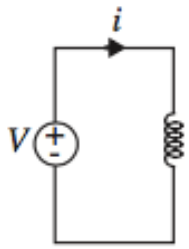
EE2210 Electric Circuits, Spring 2017

Practice problems (Lecture4-Lecture7)

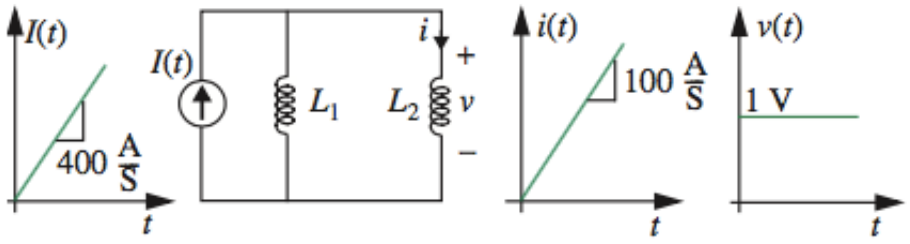
1. Find the equivalent capacitance or inductance of the following circuits.



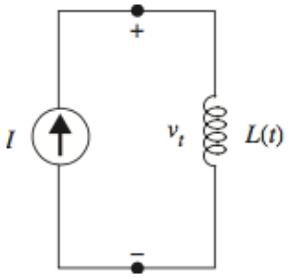
2. Find the current i in the following figure when the voltage source is an impulse function δ(t).



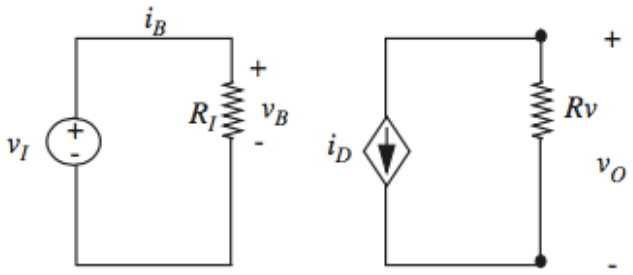
3. Consider the following circuit with two parallel inductors and one current source. The current source I(t), the current flows through L_2, i(t), and the voltage across L_2, v(t) are shown as follows. What are L_1 and L_2?



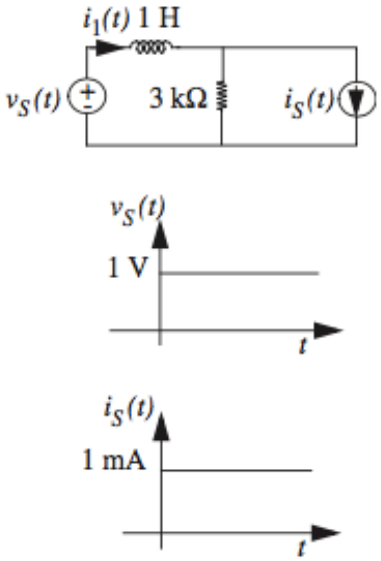
4. A constant current source having value I drives a time-varying inductor shown in the following figure. The inductance is $L(t) = L_0 + L_1*\sin(\omega t)$. Determine the inductor voltage v(t).



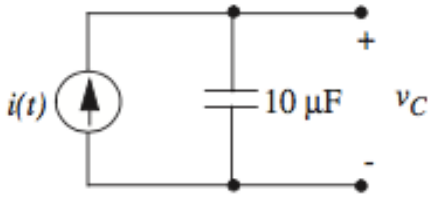
5. Consider the circuit in the following figure. (a) Determine vo if $i_D = K_1 v_B$. (b) Determine vo if $i_D = K_2 i_B$.



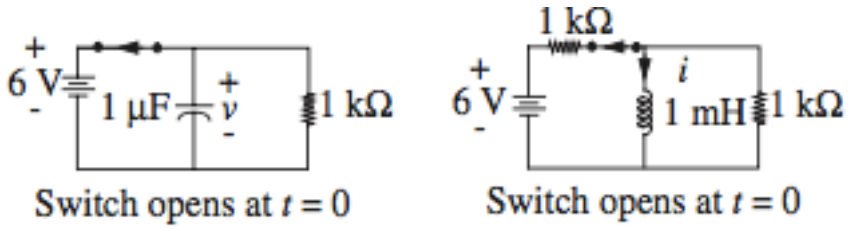
6. Determine $i_1(t)$ in the following circuit.



7. In the following circuit, i(t) = 100 μA between 0 < t < 1 s, and i(t) = 0 A otherwise. At t = 2 s, the voltage v_C = 5 V. What is v_C at t = -1 s?



8. Find the response of the following circuits for t > 0. Assume the input is shown for t > 0, and initial zero state.



9. The switch has been closed for a long time before opening at t = 0. (a) Find the value of L such that vo(t = 1 ms) equals 0.5*vo(t = 0). (b) Find the energy dissipated by the 10-Ohm resistor at t = 1 ms.