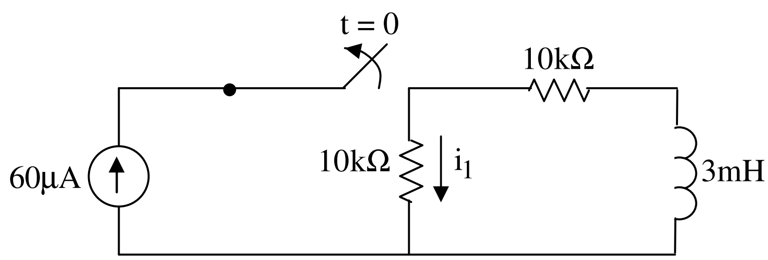
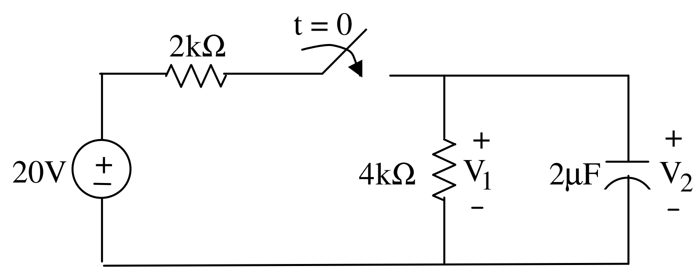
UNIVERSITY OF UTAH
ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT

ECE 1270 **HOMEWORK #6** Summer 2009

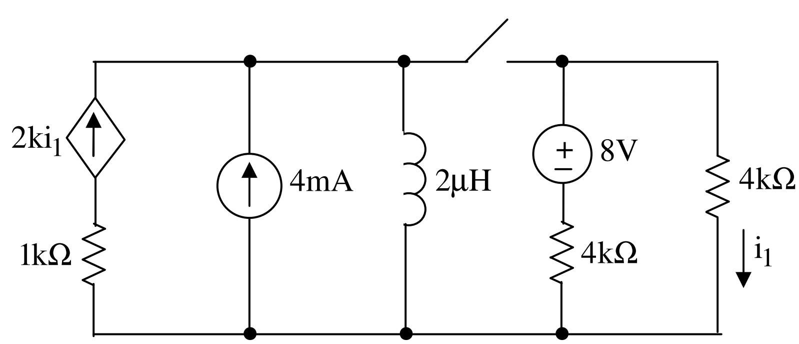
1. After being closed a long time, the switch opens at t = 0. Find $i_1(t)$ for $t > 0$.



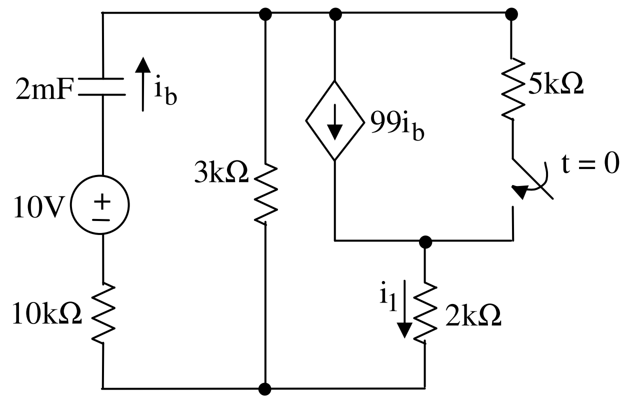
2. After being open for a long time, the switch closes at t = 0. Find $V_1(t)$ for $t > 0$.



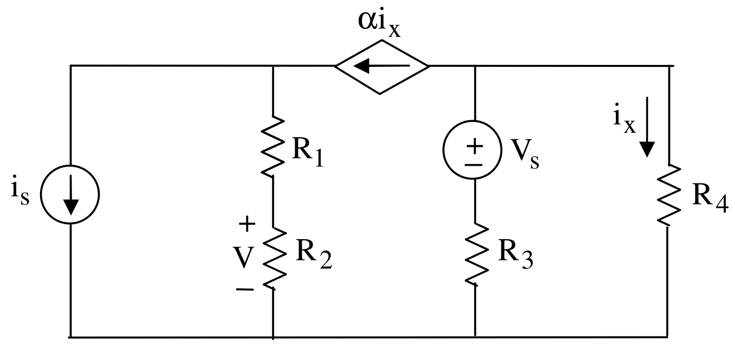
3. After being open for a long time, the switch closes at t = 0. Find $i_1(t)$ for $t > 0$.



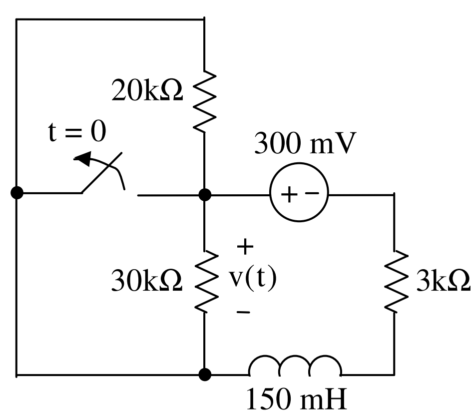
4. After being open for a long time, the switch closes at t = 0. Find $i_1(t)$ for t > 0.



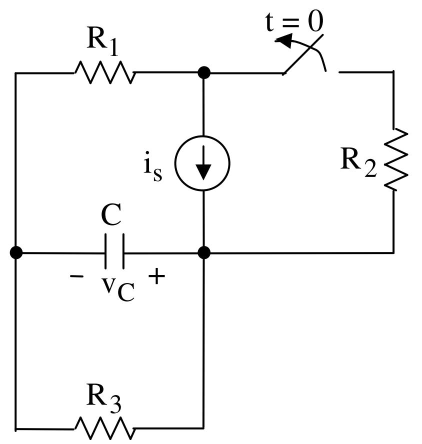
5. Using superposition, derive an expression for V that contains no circuit quantities other than $i_s, R_1, R_2, R_3, R_4, \alpha$, or V_s.



6. After being closed for a long time, the switch opens at t=0.
   a) Calculate the energy stored on the inductor as t -> ∞.
   b) Write a numerical expression for *v(t)* for t> 0.

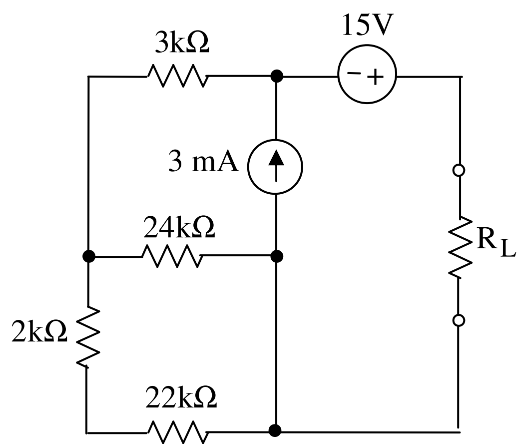


7. After being open for a long time, the switch closes at $t=0$.
   a) Write an expression for $v_c(t=0^+)$.
   b) Write an expression for $v_c(t>0)$ in terms of i_s, R_1, R_2, R_3, and C.



Use the circuit below for both problem 8 and 9.

8. Calculate the value of R_L that would absorb maximum power.
9. Calculate that value of maximum power R_L could absorb.



10. Using superposition, derive an expression for i that contains no circuit quantities other than $i_s, R_1, R_2, R_3, R_4, \alpha$, or V_s.