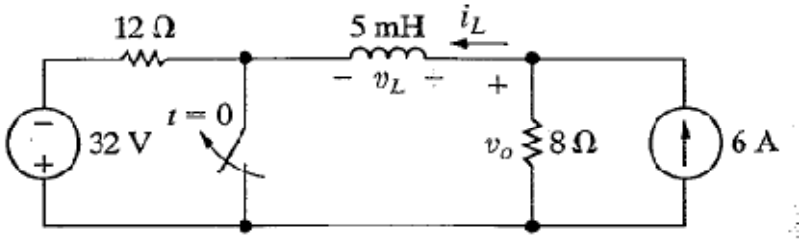
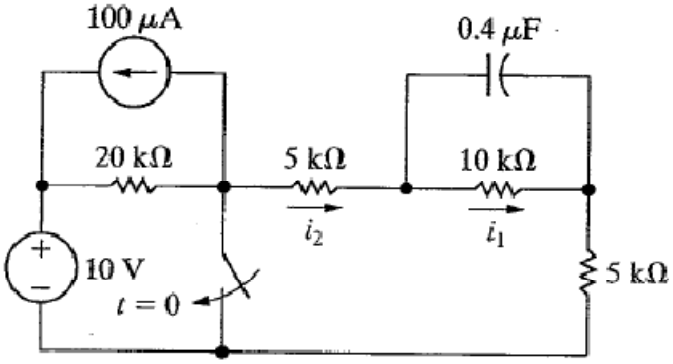
UNIVERSITY OF UTAH
ELECTRICAL & COMPUTER ENGINEERING DEPARTMENT

ECE 1270 **HOMEWORK #6** Summer 2010

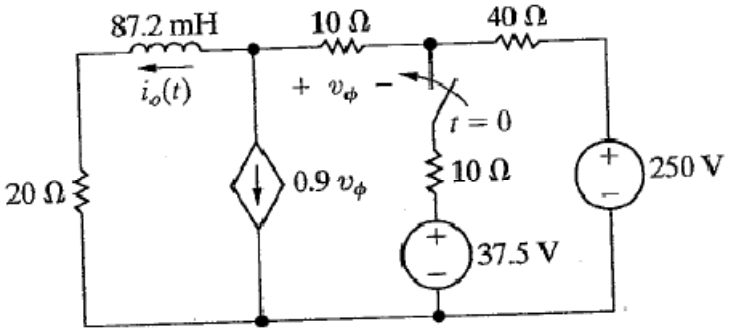
1. After being closed a long time, the switch opens at t = 0. Find $v_o(t)$ or t > 0.



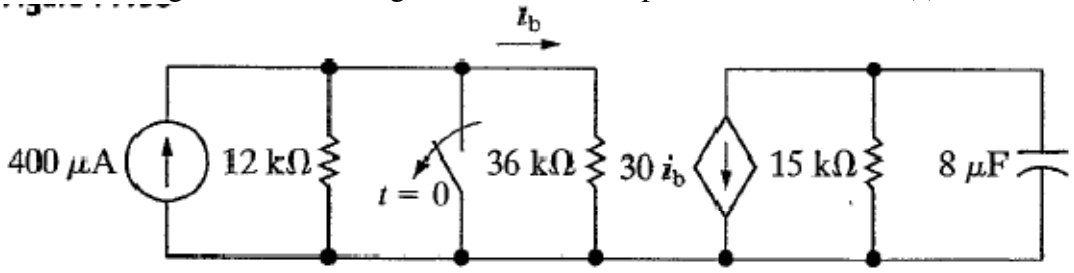
2. After being open for a long time, the switch closes at t = 0. Find $i_1(t)$ and $i_2(t)$ for t > 0.



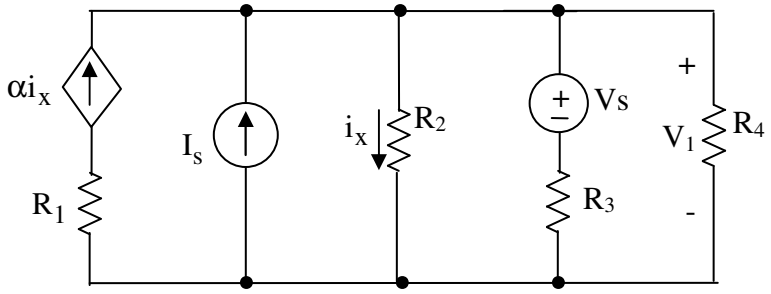
3. After being open for a long time, the switch closes at t = 0. Find $v_\phi(t)$for t > 0.



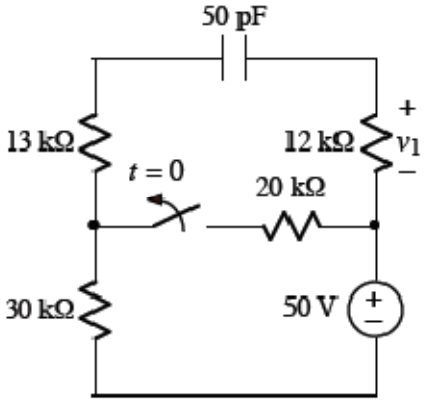
4. After being closed for a long time, the switch opens at t = 0. Find $i_b(t)$ for t > 0.



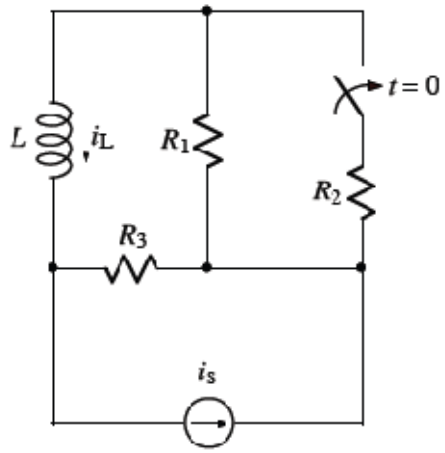
5. Using superposition, derive an expression for V_1 that contains no circuit quantities other than $i_s, R_1, R_2, R_3, R_4, \alpha$, or V_s.



6. After being closed for a long time, the switch opens at t=0.
   a) Calculate the energy stored on the capacitor as t -> ∞.
   b) Write a numerical expression for $v_1(t)$ for t> 0.



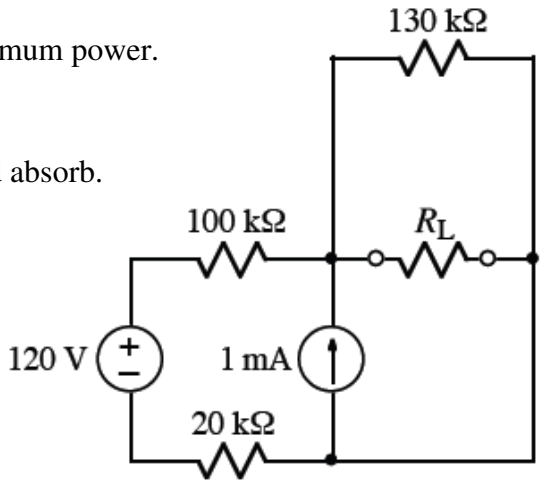
7. After being open for a long time, the switch closes at *t=0.*
   a) Write an expression for $i_L(t=0^+)$.
   b) Write an expression for i_L (t>0) in terms of i_s, R_1, R_2, R_3, and L.



Use the circuit at the right 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_2 that contains no circuit quantities other than $i_s, R_1, R_2, R_3, \alpha$, or V_s.