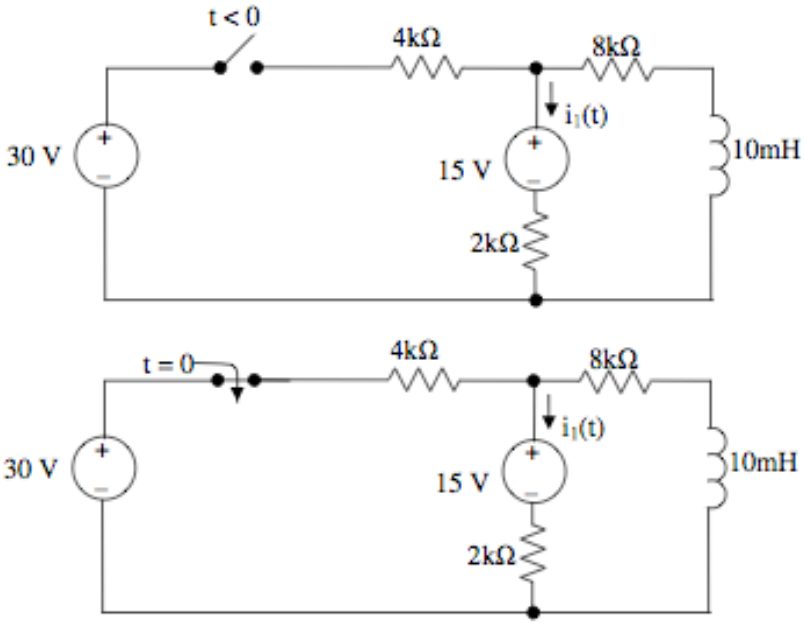
HOMEWORK #12

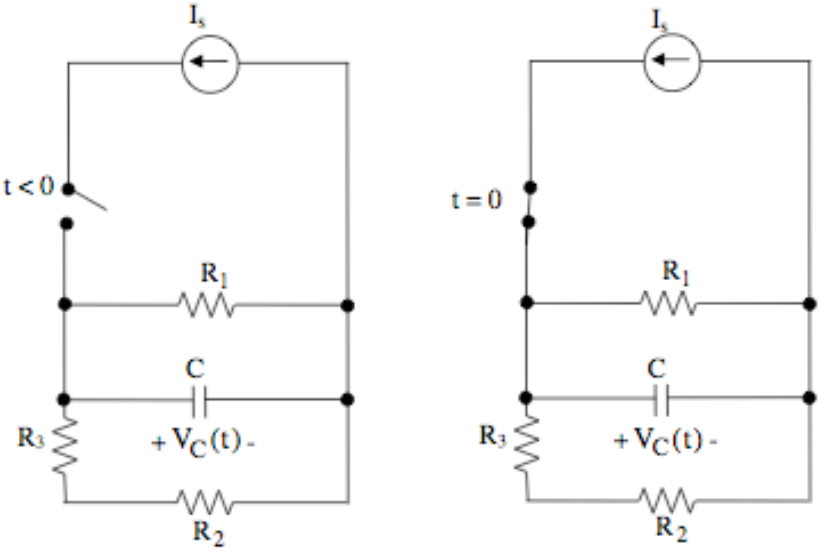
1.



After being open for a long time, the switch closes at $t = 0$.
Calculate the energy stored on the inductor as $t \to \infty$.

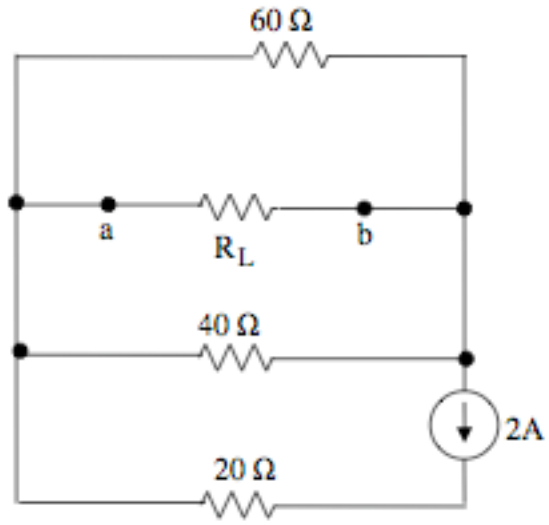
2. For the circuit in problem 1, write a numerical expression for $i_1(t)$ for $t > 0$.

3.



After being open for a long time, the switch closes at $t = 0$. Write an expression for $v_C(t > 0)$ in terms of at most circuit quantities R_1, R_2, R_3, i_s, and C.

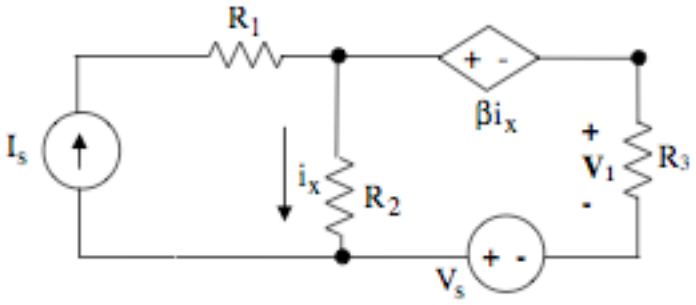
4.



a) Calculate the value of R_L that would absorb maximum power.

b) Calculate that value of maximum power R_L could absorb.

5.



Using superposition, derive an expression for v_1 that contains no circuit quantities other than i_s, v_S, R_1, R_2, R_3, and β, where $\beta<0$.