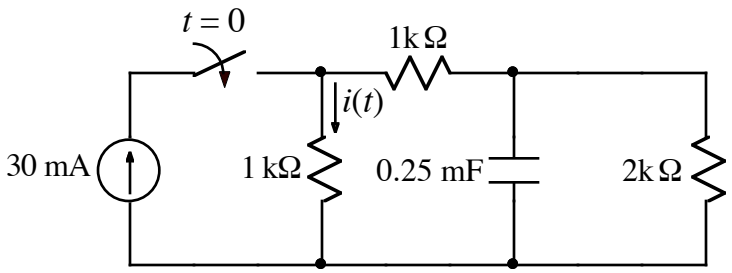
HOMEWORK #12

1.

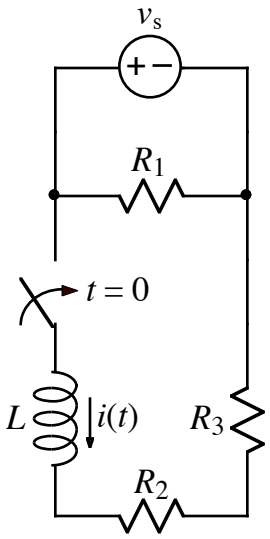


After being open for a long time, the switch closes at $t = 0$.

Calculate the energy stored on the capacitor as $t \rightarrow \infty$.

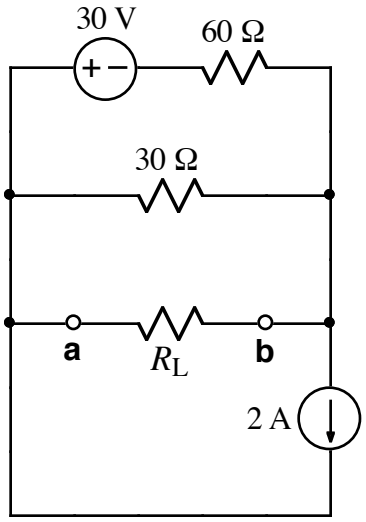
2. For the circuit in problem 1, write a numerical expression for $i(t)$ for $t > 0$.

3.



After being open for a long time, the switch closes at $t = 0$. Write an expression for $i_L(t > 0)$ in terms of no circuit quantities other than R_1, R_2, R_3, v_s, and L.

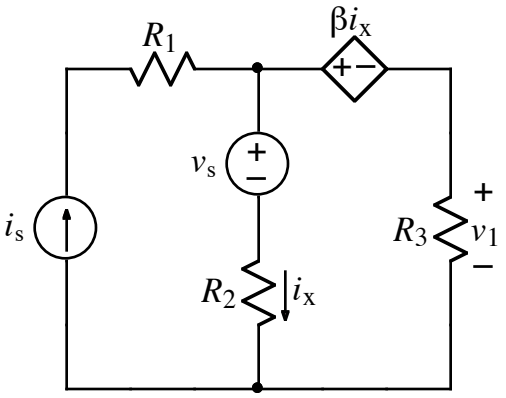
4.



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, and β, where $\beta > 0$.