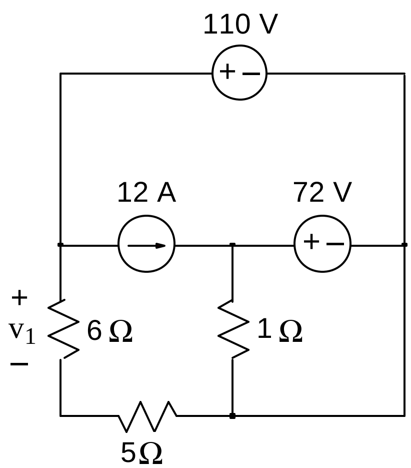
UNIVERSITY OF UTAH
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

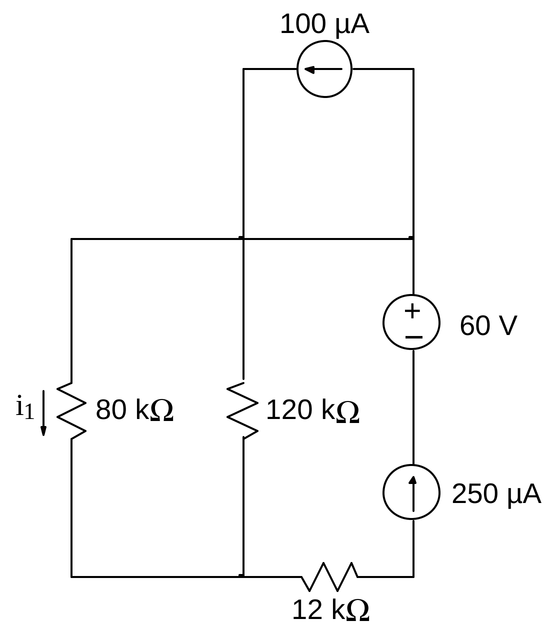
ECE 1270 HOMEWORK #2 Summer 2007

1.



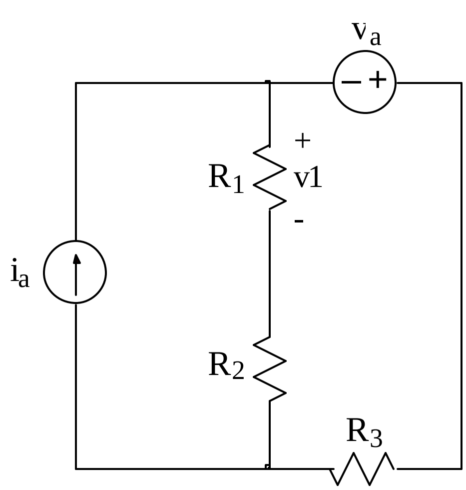
Calculate v_1.

2.



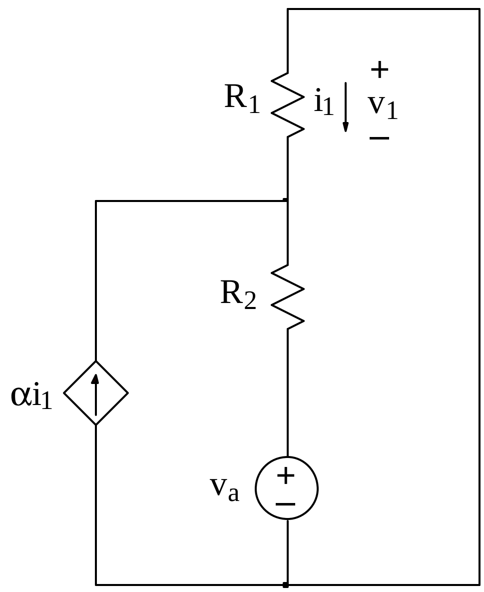
Calculate i_1.

3.



Derive an expression for v_1. The expression must not contain more than the circuit parameters v_a, i_a, R_1, R_2, and R_3.

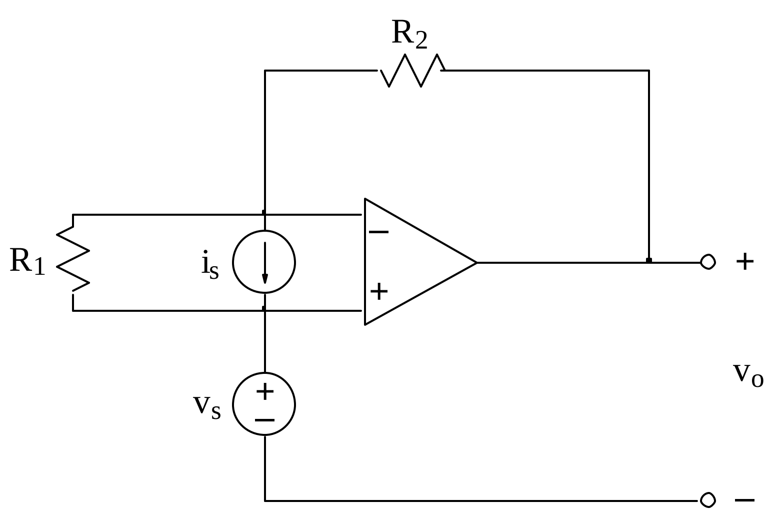
4.



a) Derive an expression for v_1. The expression must not contain more than the circuit parameters α, v_a, R_1, and R_2. **Note:** $\alpha > 0$.

b) Make at least one consistency check (other than a units check) on your expression. In other words, choose component values that make it possible to solve the circuit by inspection, and verify that your answer to (a) gives that answer. Specify your consistency check by listing a numerical value for every source and resistor.

5.



The op-amp operates in the linear mode. Using an appropriate model of the op-amp, derive an expression for v_o in terms of not more than v_s, i_s, R_1, and R_2.