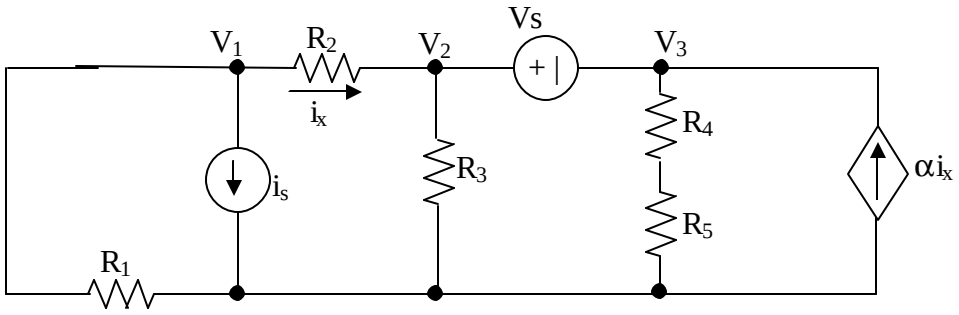
UNIVERSITY OF UTAH
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

ECE 1270 HOMEWORK #4 Summer 2007

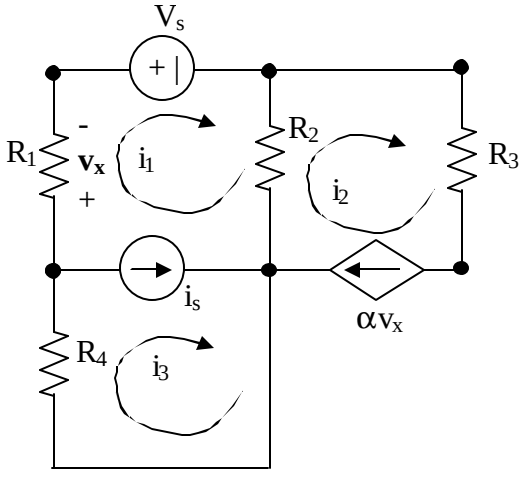
1.



For the circuit shown, write three independent equations for the node voltages V_1, V_2, and V_3. The quantity i_x must not appear in the equations.

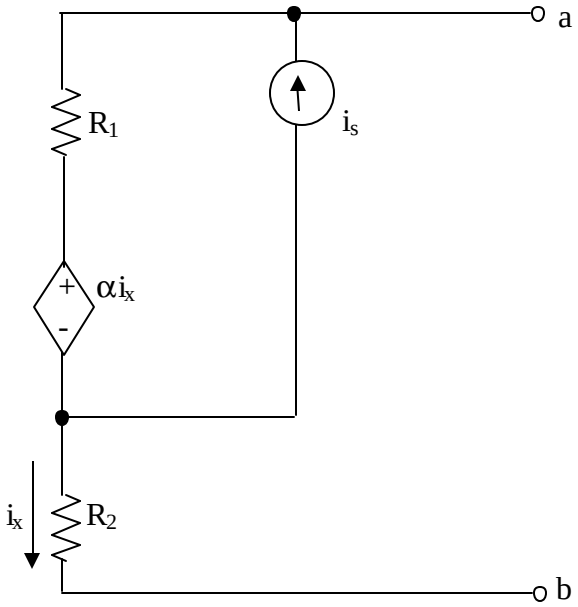
2. Make a consistency check on your equations for Problem 1 by settings resistors and sources to values for which the values of V_1, V_2, and V_3 are obvious. State the values of resistors, sources, and for your consistency check, and show that your equations for Problem 1 are satisfied for these values. (In other words, plug in the values into your equations for Problem 1 and show that the left side and the right side of each equation are equal.)

3.



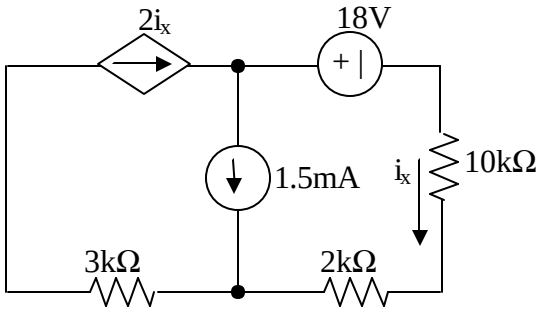
For the circuit shown, write three independent equations for the three mesh currents i_1, i_2, and i_3. The quantity v_x must not appear in the equations.

4.



Find the Thevenin equivalent circuit at terminals a-b. i_x must not appear in your solution. **Note:** $0 < a < 1$**.**

5.



Calculate the power consumed (ie dissipated) by the 18V source. **Note:** If a source supplies power, the power it consumes is negative.