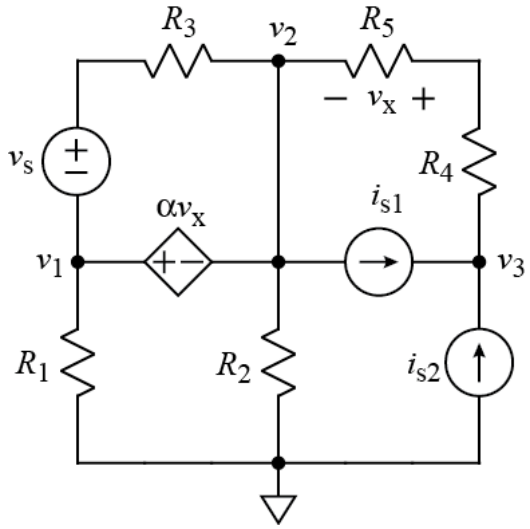
HOMEWORK #8

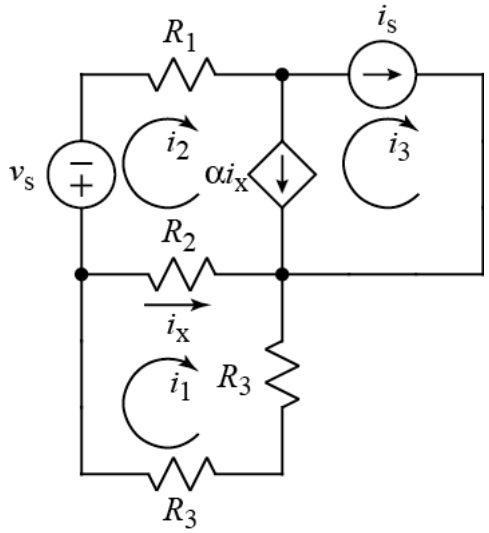
1.



For the circuit shown, write three independent equations for the node-voltages, v_1, v_2, and v_3. The quantity v_x must not appear in the equations. Only component and source names may appear in answer.

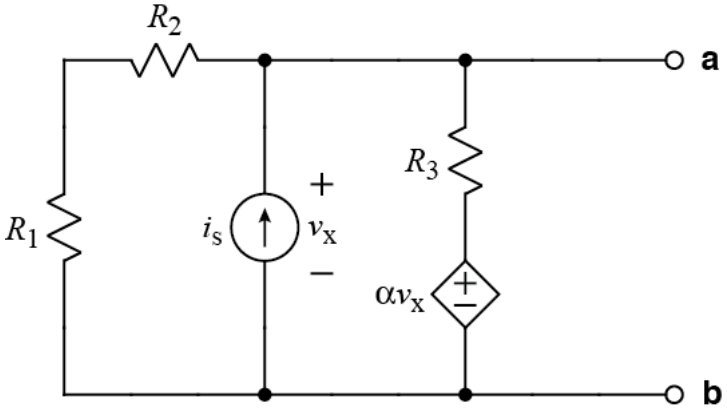
2. Make at least one consistency check (other than a units check) on your expression for problem 1. In other words, choose component values that make the values of v_1, v_2, and v_3 obvious, and verify that your answer to problem 1 gives these values. State the values of resistors and sources for your consistency check.

3.



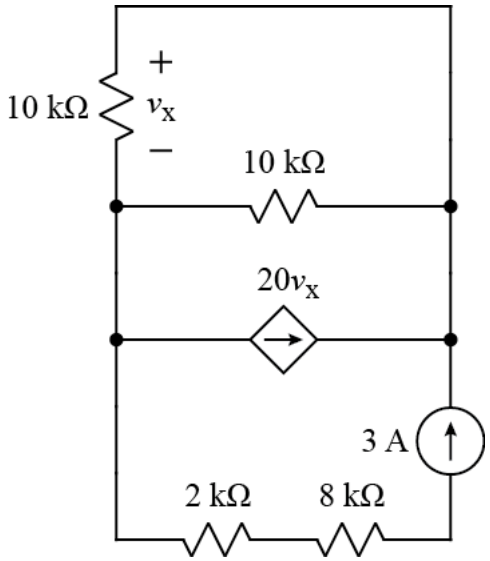
For the circuit shown, write three independent equations for the three mesh currents, i_1, i_2, and i_3. The quantity i_x must not appear in the equations.

4.



Find the Thevenin equivalent circuit at terminals a-b. v_x must not appear in your solution. The expression must not contain more than circuit parameters α, R_1, R_2, R_3, and i_s. **Note:** $0 < \alpha < 1$.

5.



Calculate the power dissipated by the dependent current source, (labeled $20v_x$).