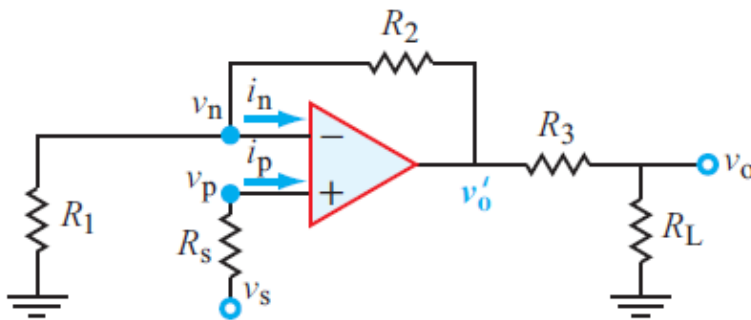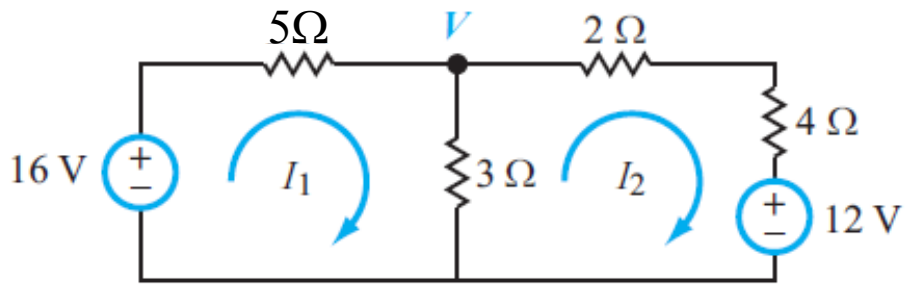# ELEN 50 Winter 2017 Problem Set # 3

Completed problems are due at beginning of class, Feb. 22, 2017

1. Obtain an expression for the voltage gain, $G = v_0/v_s$ in terms of the resistors in the circuit.. Use the ideal op-amp approximation. The expression does not involve R_s – why is this the case?
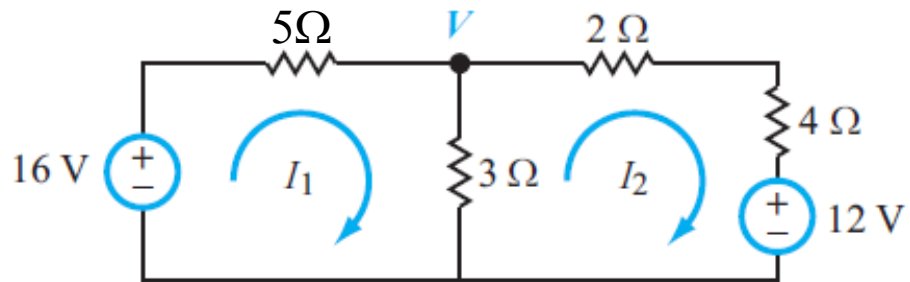
2. Use the mesh current by inspection method to write the matrix equation directly for the loop currents in this circuit. Solve for the mesh currents and obtain V.

5Ω V 2Ω

16 V I_1 3Ω I_2 4Ω 12 V

3. Write the KVL equations for the current loops for the circuit in Problem 2 and show that they result in the same matrix equation that you got earlier.

4. Solve for V in the circuit of Problem 2 using the node voltage method. Show that
   this result agrees with the solutions for Problem 2 and Problem 3.

5. Find the Thevenin voltage and Thevenin resistance at terminals a and b for this circuit.