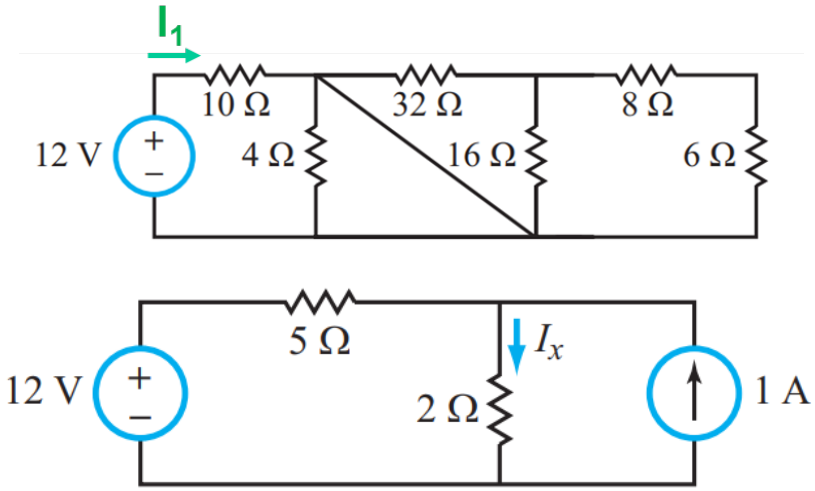
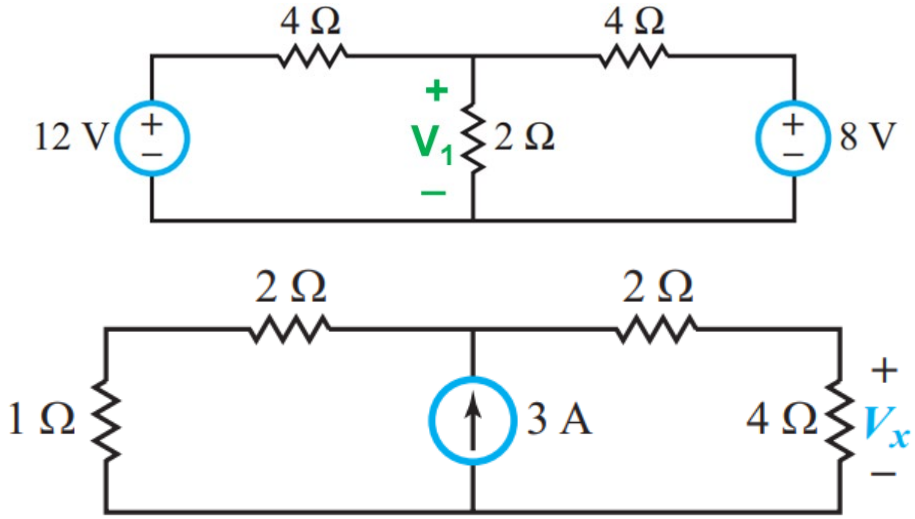
Spring 2024 – ECE 3020
Homework 0

Due: 01/10/2024

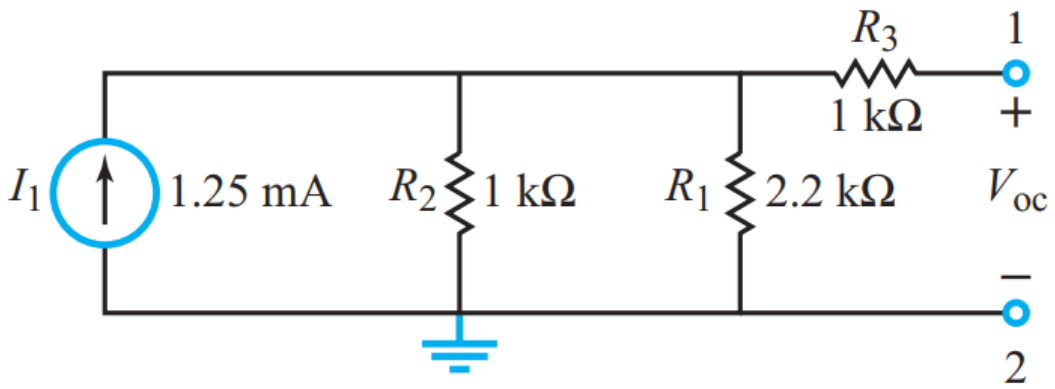
1. Find the value of I_1 and I_x in the circuits below



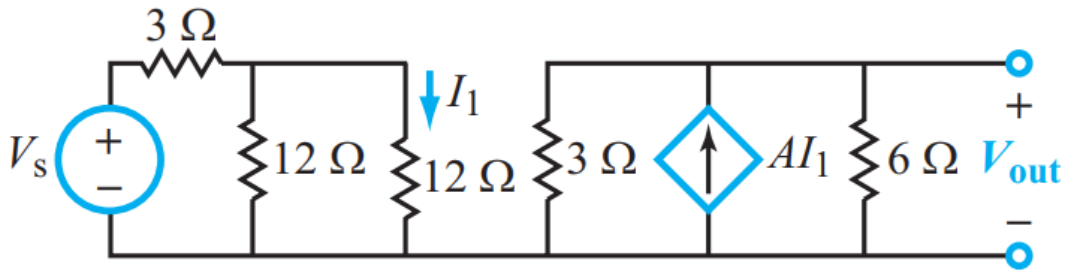
2. Find the value of V_1 and V_x in the circuit below



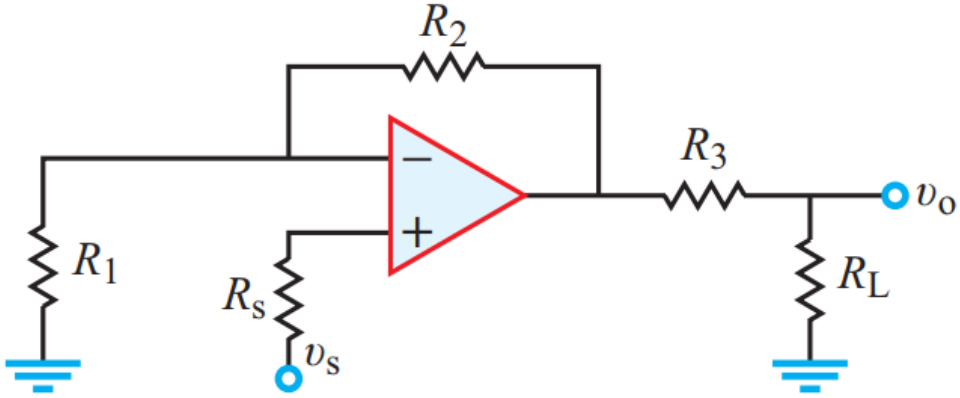
3. For the circuit shown below.
   a. Determine the open circuit voltage.
   b. Determine the short circuit current between the output terminals.
   c. Determine the Thevenin resistance for the circuit.



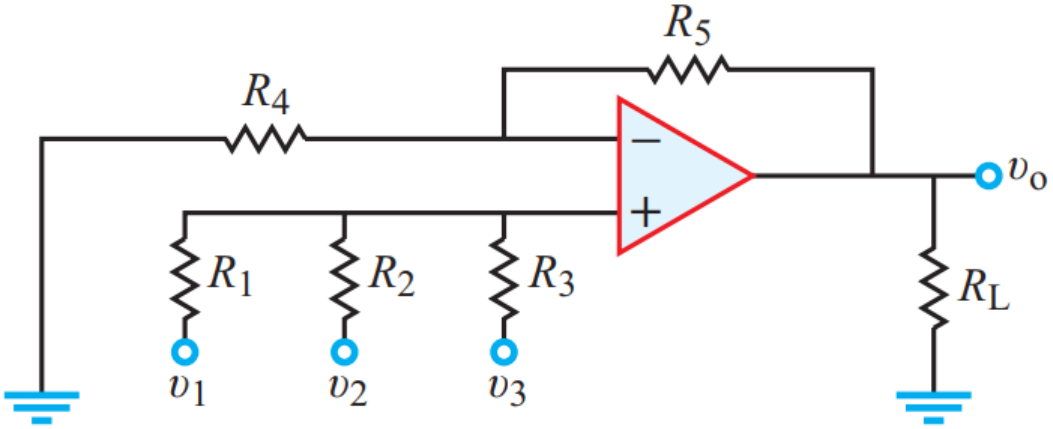
4. Determine V_{out}/V_s for A = 36A/A.



5. Write an expression for v_O in terms of v_S.



6. Find v_O in terms of v_1, v_2 and v_3.



7. For the circuits below, assuming the opamp is ideal
   a. Write the transfer functions (T(s) = v_o/v_i) of each circuits below.
   b. Write the expression for the magnitude (|T(jω)|) and phase (<T(jω)) for each
   c. Sketch their Bode plots marking all relevant magnitudes and frequencies for R = 10kΩ and C = 15.91pF.