PROBLEM SET #2

Issued: Friday, September 06, 2019

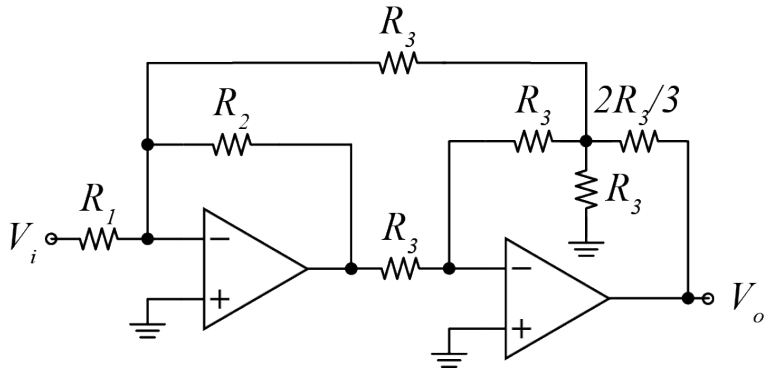
Due: Friday, September 13, 2019, 12:00 noon via **Gradescope**.

1. Sedra & Smith, Problem 2.35

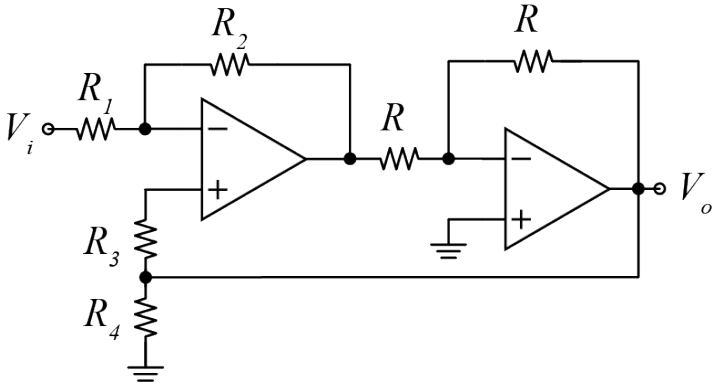
2. Sedra & Smith, Problem 2.48

3. Sedra & Smith, Problem 2.62

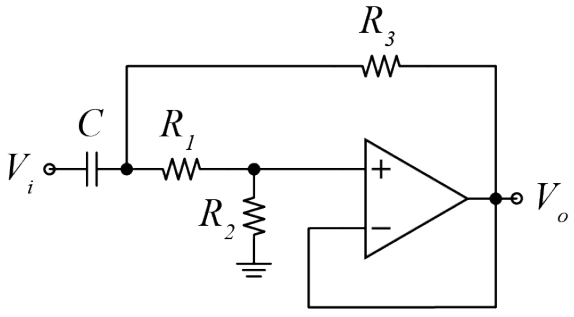
4. Find an expression for V_o/V_i, input, and output impedances, in terms of R_1, R_2, and R_3. The Opamps are ideal.



5. Find an expression for V_o/V_i in terms of R, R_1, R_2, R_3, and R_4. The Opamps are ideal.



6. Draw the phase and magnitude Bode plots of the circuit for the following component values: R_1=10KΩ, R_2=2KΩ, R_3=5KΩ, C=3μF.



7. Create a SPICE netlist for the circuit shown below by following the procedures described in the handout "HSPICE Tutorial". Run a transient analysis. Attach the plot of V_o versus time for 5 periods. R_L=*1KΩ, C=1μF*.

(a) What is the magnitude of the peak-to-peak voltage ripple across the load resistor R_L?

(b) Suppose that the load resistor R_L and the input voltage are fixed, but the value of capacitor C varies. What value of capacitance C would you choose to reduce the output ripple to $0.5\text{V} \pm 0.01\text{V}$ peak-to-peak? (Estimate using hand analysis before you verify with simulation. Show your hand analysis.)