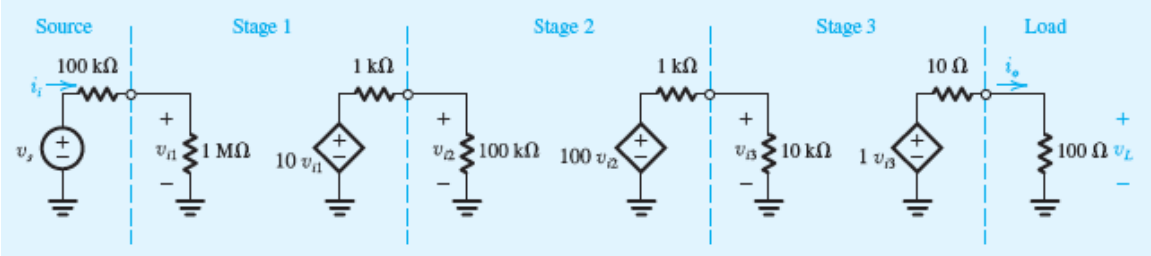
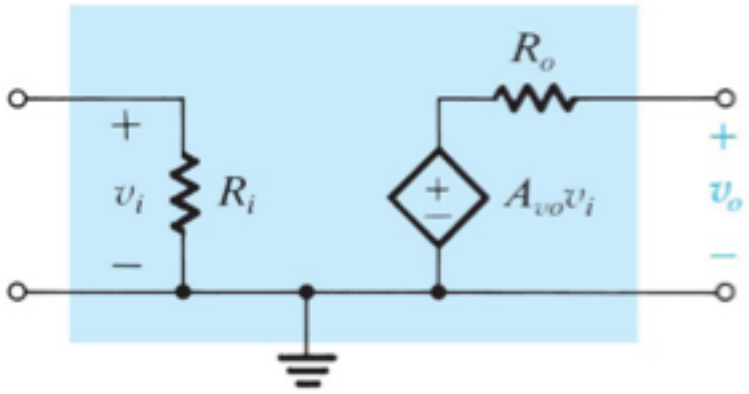
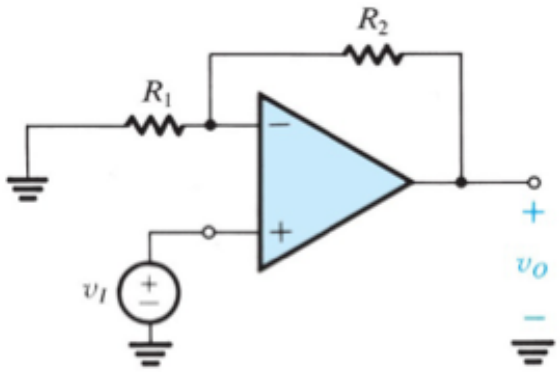
T.2.1 A voltage amplifier is build as a cascade of three stages. The input signal source has a source resistance of 100 kΩ, and the output resistive load is 100 Ω. The voltage gains, input and output resistances of each stage are shown in the schematic below. Find the overall voltage gain v_L/v_s .



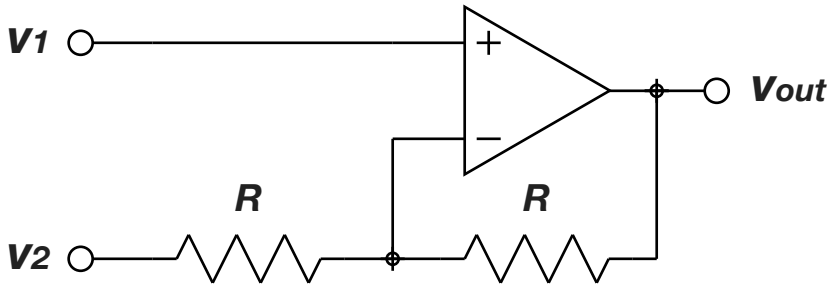
T.2.2 The output voltage of a voltage amplifier has been found to decrease by 50% when a load resistance of 1 kΩ is connected. What is the value of the amplifier output resistance?



T.2.3 Calculate the closed-loop gain of the amplifier shown below assuming that the ideal op amp has a finite open-loop gain A. For $R_1 = 1$ kΩ and $R_2 = 19$ kΩ find the percentage deviation ε of the closed-loop gain from the ideal value of $(1+R_2/R_1)$ for the case of $A = 1 \cdot 10^3$ V/V.



T.2.4 Find an expression for v_{out} as a function of v_1 and v_2 in the op amp circuit shown below, and determine the input resistances seen by each input in this configuration. Assume that op amps are ideal.



T.2.5 Find an expression for v_{out} as a function of v_1 and v_2 in the op amp circuit shown below, and determine the input resistances seen by each input in this configuration. Assume that op amps are ideal.