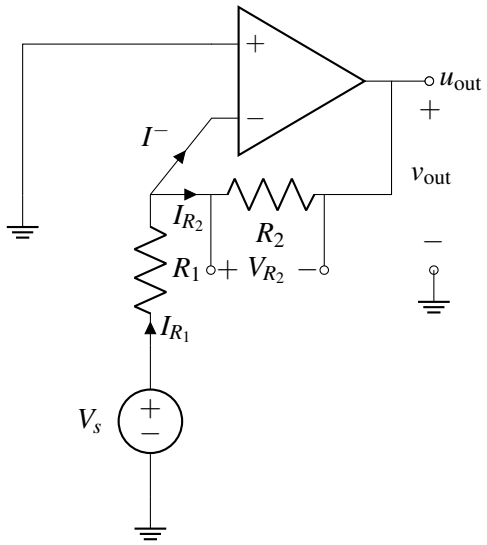
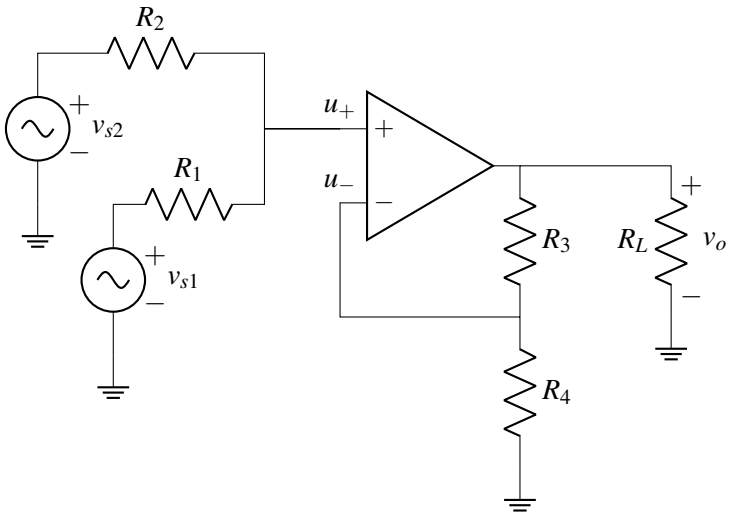
EECS 16A Designing Information Devices and Systems I
Summer 2023 Discussion 06C

1. An Inverting Amplifier



Calculate v_{out} as a function of V_s and R_1 and R_2.

2. Multiple Inputs To One Op-Amp



(a) First, let's focus on the left part of the circuit containing the voltage sources v_{s1} and v_{s2}, and resistances R_1 and R_2. Solve for u_+ in the circuit above. *(Hint: Use superposition.)*

(b) How would you choose R_1 and R_2 that produce a voltage $u_+ = \frac{1}{2}V_{s1} + \frac{1}{2}V_{s2}$? Could you also achieve $u_+ = \frac{1}{3}V_{s1} + \frac{2}{3}V_{s2}$?

(c) Now, for the whole circuit, find an expression for v_o.

(d) How should we select our values R_1, R_2, R_3, R_4 to find the sum of different signals, i.e. $V_{s1} + V_{s2}$? What about taking the sum and multiplying by 2, i.e. $2(V_{s1} + V_{s2})$?