HW6: **Name:**_____

Lab Section:_____

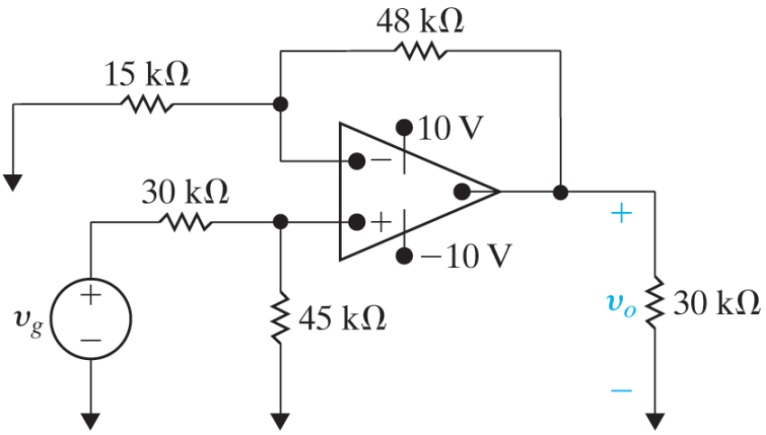
5.20 PSPICE / MULTISIM The op amp in the circuit shown in Fig. P5.20 is ideal,

a. Calculate v_o when v_g equals 3 V.

b. Specify the range of values of v_g so that the op amp operates in a linear mode.

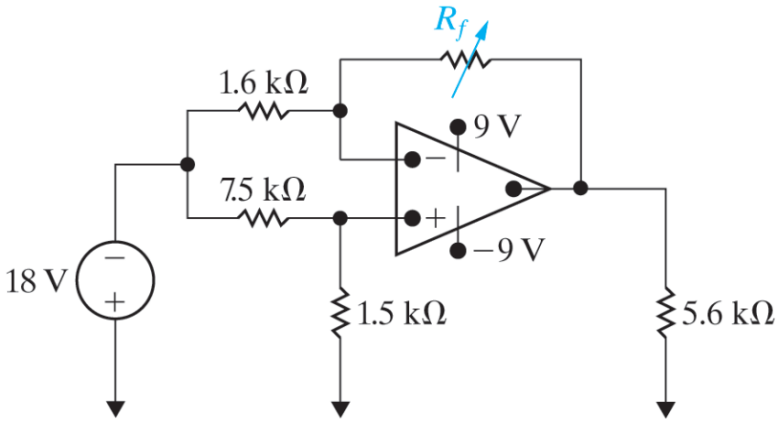
c. Assume that v_g equals 5 V and that the 48 kΩ resistor is replaced with a variable resistor. What value of the variable resistor will cause the op amp to saturate?

Figure P5.20



5.26 The resistor R_f in the circuit in Fig. P5.26 is adjusted until the ideal op amp saturates. Specify R_f in kilohms.

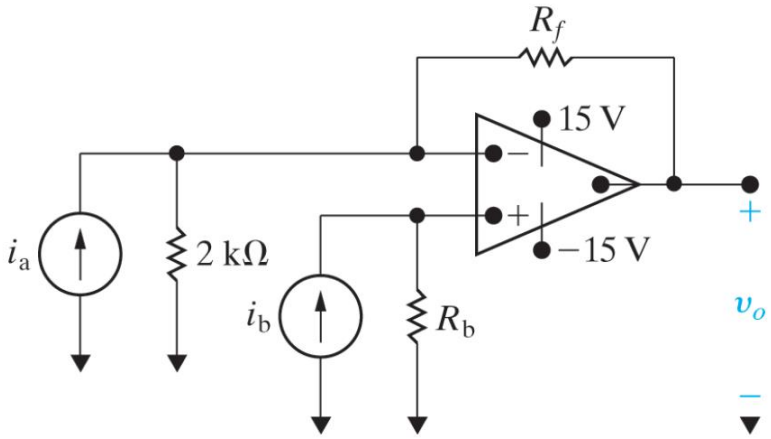
Figure P5.26



5.30 DESIGN PROBLEM PSPICE MULTISIM Select the values of R_b and R_f in the circuit in Fig. P5.30 so that

$$v_o = 8000(i_b - i_a).$$

Figure P5.30



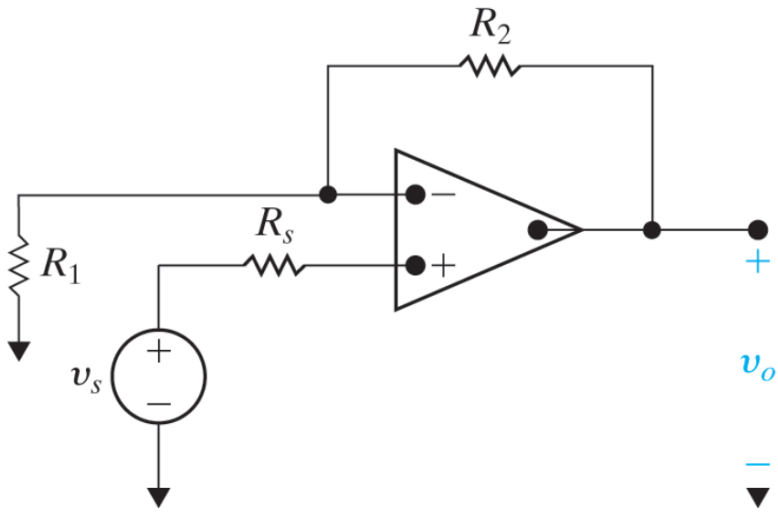
5.35 Assume that the ideal op amp in the circuit seen in Fig. P5.35 is operating in its linear region.

a. Show that $v_o = [(R_1 + R_2)/R_1]v_s$.

b. What happens if $R_1 \to \infty$ and $R_2 \to 0$?

c. Explain why this circuit is referred to as a voltage follower when $R_1 = \infty$ and $R_2 = 0$.

Figure P5.35

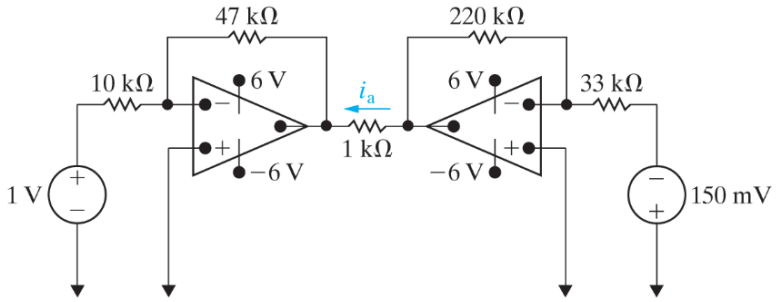


5.39 PSPICE / MULTISIM The op amps in the circuit in Fig. P5.39 are ideal.

a. Find i_a.

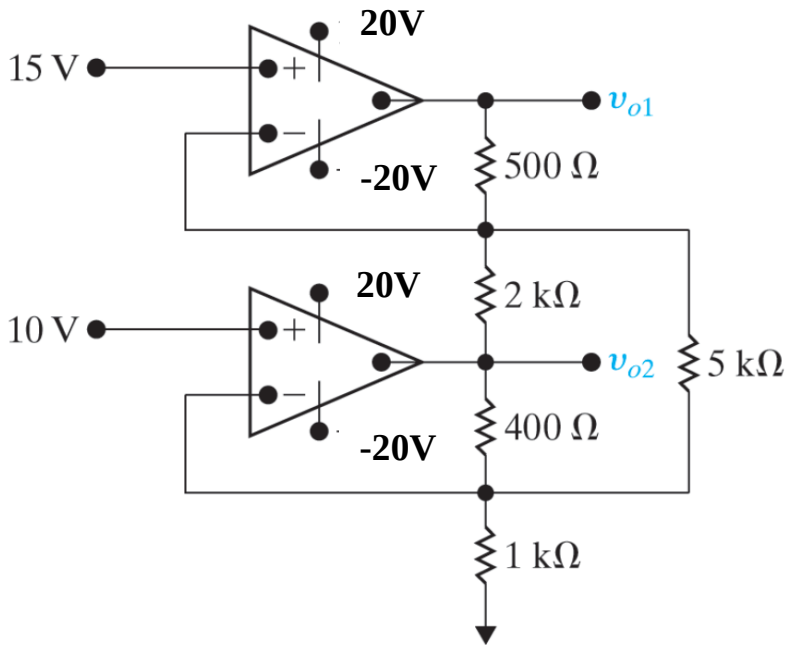
b. Find the value of the left source voltage for which $i_a = 0$.

Figure P5.39



5.40 PSPICE MULTISIM The two op amps in the circuit in Fig. P5.40 are ideal. Calculate v_{o1} and v_{o2}.

Figure P5.40



(Note: This problem is slightly modified from the P5.40 in the textbook. The 15-V supplies in the textbook is now changed to 20V)