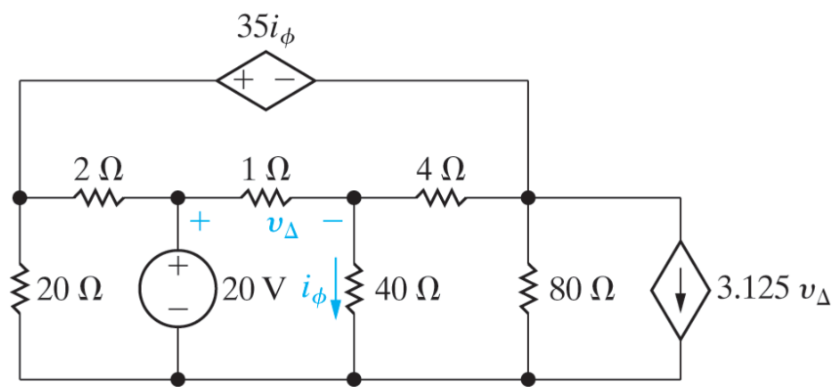
HW5: **Name:______________________**

Lab Section:________________

4.29 PSPICE / MULTISIM Use the node-voltage method to find the power developed by the 20 V source in the circuit in Fig. P4.29.

Figure P4.29



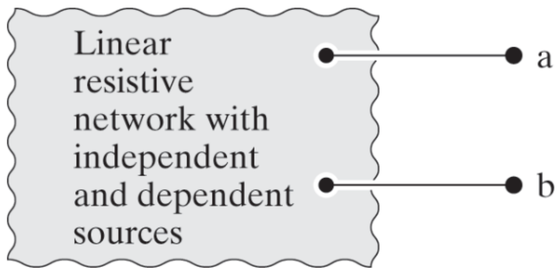
4.71 A Thévenin equivalent can also be determined from measurements made at the pair of terminals of interest. Assume the following measurements were made at the terminals a,b in the circuit in Fig. P4.71.

When a 20 Ω resistor is connected to the terminals a, b, the voltage v_{ab} is measured and found to be 100 V.

When a 50 Ω resistor is connected to the terminals a, b, the voltage is measured and found to be 200 V.

Find the Thévenin equivalent of the network with respect to the terminals a, b.

Figure P4.71

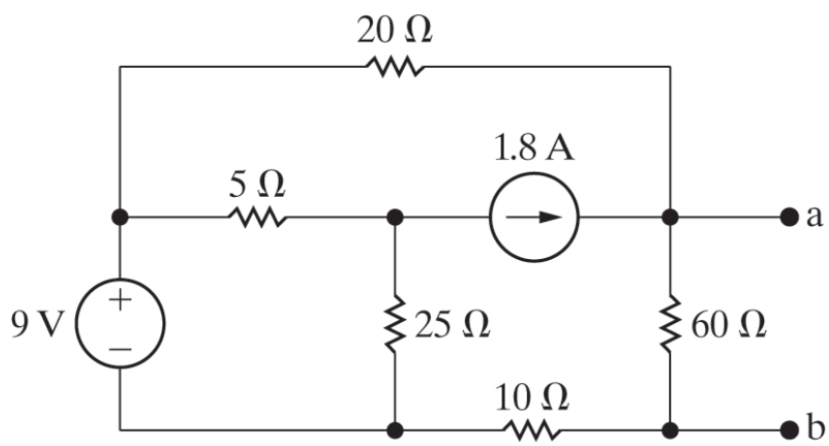


4.78 PSPICE MULTISIM

a. Find the Thévenin equivalent with respect to the terminals a, b for the circuit in Fig. P4.78 by finding the open-circuit voltage and the short-circuit current.

b. Solve for the Thévenin resistance by removing the independent sources. Compare your result to the Thévenin resistance found in (a).

Figure P4.78



5.5 PSPICE MULTISIM The op amp in the circuit in Fig. P5.5 is ideal. Calculate the following:

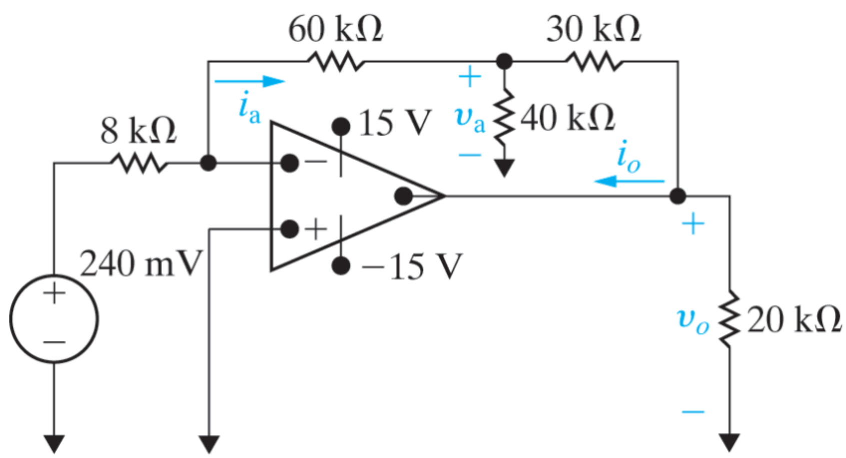
a. i_a;

b. v_a;

c. v_o;

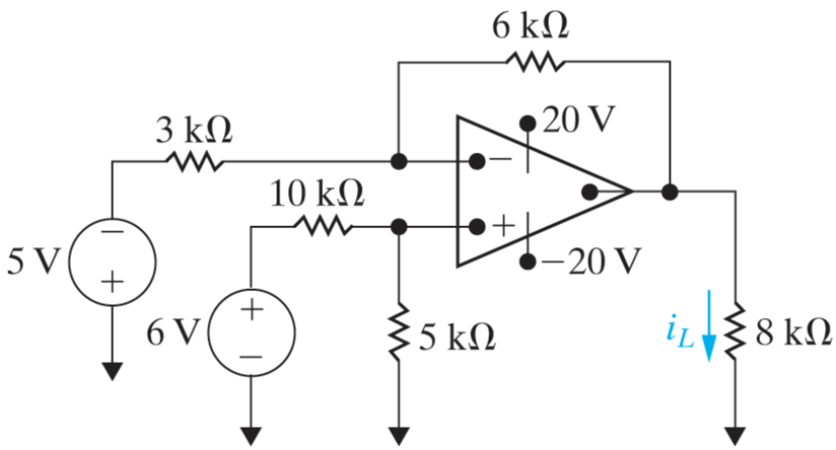
d. i_o.

Figure P5.5



5.6 PSPICE / MULTISIM Find i_L (in milliamperes) in the circuit in Fig. P5.6.

Figure P5.6



5.9

a. Design an inverting amplifier with a gain of 4. Use an ideal op amp, a $30\,\mathrm{k}\Omega$ resistor in the feedback path, and $\pm 12\,\mathrm{V}$ power supplies.

b. Using your design from part (a), determine the range of input voltages that will keep the op amp in its linear operating region.

c. Suppose you wish to amplify a 2 V signal, using your design from part (a) with a variable feedback resistor. What is the largest value of feedback resistance that keeps the op amp in its linear operation region? Using this resistor value, what is the new gain of the inverting amplifier?

5.10 PSPICE / MULTISIM The op amp in the circuit in Fig. P5.10 is ideal.

a. Find the range of values for σ in which the op amp does not saturate.

b. Find i_o (in microamperes) when $\sigma = 0.272$.

Figure P5.10