HW1: **Name:**_____

Lab Section:_____

1.13 Two electric circuits, represented by boxes A and B, are connected as shown in Fig. P1.13. The reference direction for the current i in the interconnection and the reference polarity for the voltage v across the interconnection are as shown in the figure. For each of the following sets of numerical values, calculate the power in the interconnection and state whether the power is flowing from A to B or vice versa.

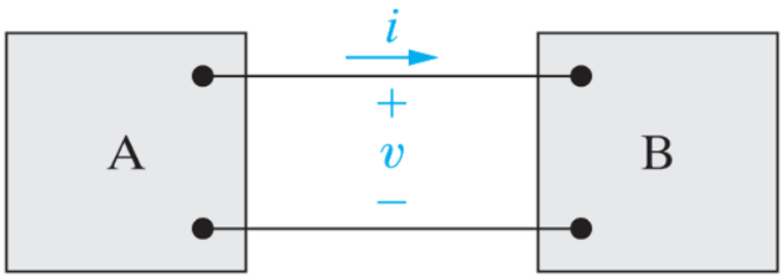
a. $i = 6\,\text{A}, \quad v = 30\,\text{V}$

b. $i = -8\,\text{A}, v = -20\,\text{V}$

c. $i = 4\,\text{A}, \quad v = -60\,\text{V}$

d. $i = -9\,\text{A}, v = 40\,\text{V}$

Figure P1.13



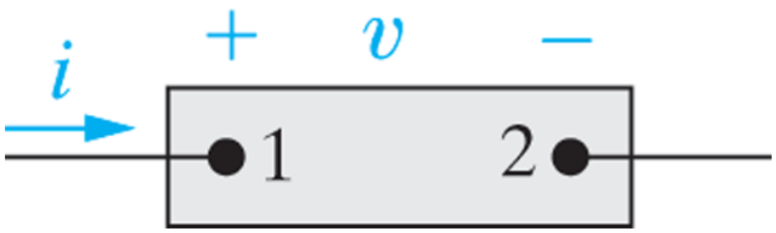
1.18 PSPICE / MULTISIM The voltage and current at the terminals of the circuit element in Fig. 1.5 are zero for $t < 0$. For $t \geq 0$ they are

$$\begin{aligned} v &= 75 - 75e^{-1000t}\ \text{V}, \\ i &= 50e^{-1000t}\text{mA}. \end{aligned}$$

a. Find the maximum value of the power delivered to the circuit.

b. Find the total energy delivered to the element.

Figure 1.5 **An ideal basic circuit element.**



1.29 The numerical values for the currents and voltages in the circuit in Fig. P1.29 are given in Table P1.29. Find the total power developed in the circuit.

Figure P1.29

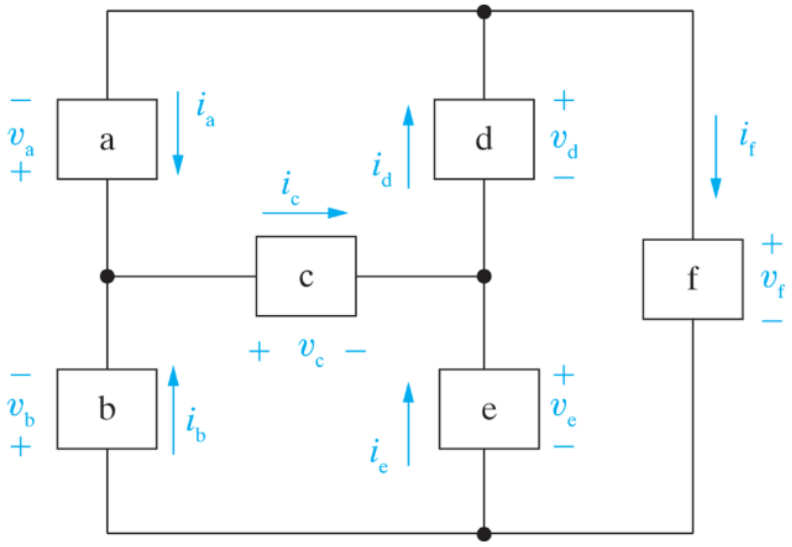


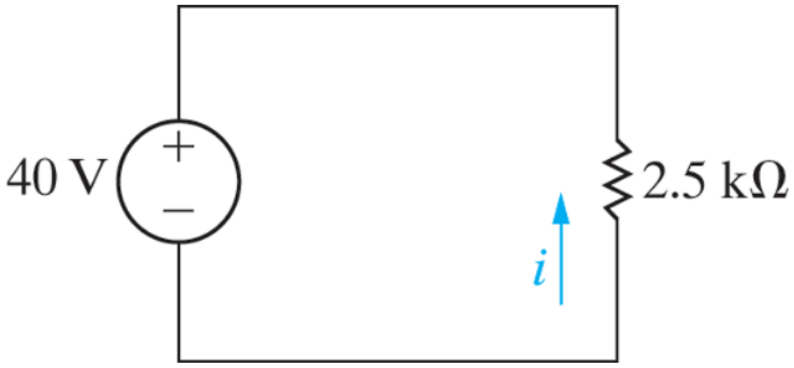
Table P1.29

Element	Voltage (V)	Current (mA)
a	−18	−51
b	−18	45
c	2	−6
d	20	−20
e	16	−14
f	36	31

Hint: 1. Developed means generated, so combine all power generated for the answer.

2.11 For the circuit shown in Fig. P2.11

Figure P2.11



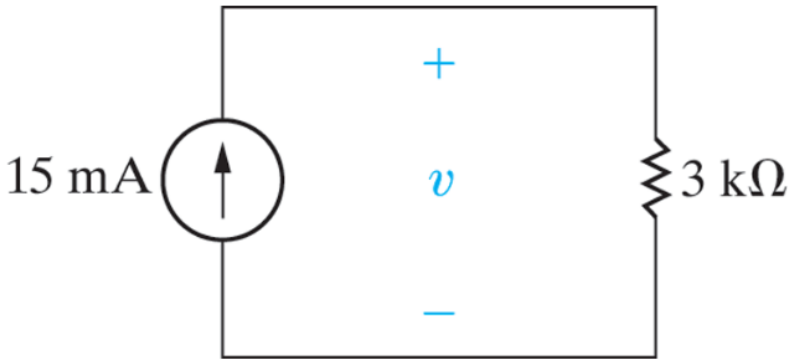
a. Find i.

b. Find the power supplied by the voltage source.

c. Reverse the polarity of the voltage source and repeat parts (a) and (b).

2.12 For the circuit shown in Fig. P2.12

Figure P2.12



a. Find v.

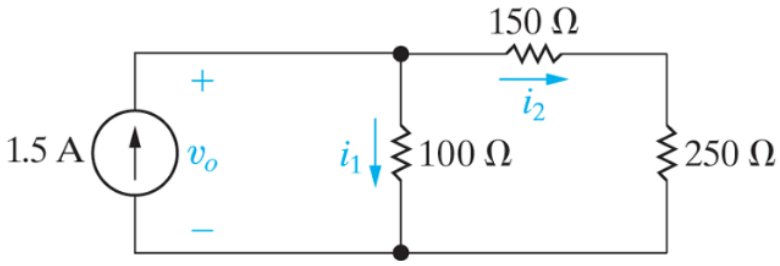
b. Find the power absorbed by the resistor.

c. Reverse the direction of the current source and repeat parts (a) and (b).

2.17 PSPICE / MULTISIM

a. Find the currents i_1 and i_2 in the circuit in Fig. P2.17.

Figure P2.17



b. Find the voltage v_o.

c. Verify that the total power developed equals the total power dissipated.

2.21 The current i_x in the circuit shown in Fig. P2.21 is 50 mA, and the voltage v_x is 3.5 V. Find (a) i_1; (b) v_1; (c) v_g; and (d) the power supplied by the voltage source.

Figure P2.21