Homework #2
Due Th. 9/13

1. (Hambley P2.8)
   (a) Determine the resistance between terminals a and b for the network shown in Figure P2.8.
   (b) Repeat after connecting c and d with a short circuit.
2. (Hambley P2.17)
   The equivalent resistance between terminals a and b in Figure P2.32 is $R_{ab} = 23\,\Omega$. Determine the value of R.
3. (Hambley P2.27)
   Find the voltage v and the currents i_1 and i_2 for the circuit shown in Figure P2.27.
4. (Hambley P2.32)
   The 12 V source in Figure P2.32 is delivering 36 mW of power. All four resistors have the same value R. Find the value of R.
5. (Hambley P2.40)
   Suppose we need to design a voltage-divider circuit to provide an output voltage $v_o = 5\,\text{V}$ from a 15 V source as shown in Figure P2.40. The current taken from the 15 V source is to be 200 mA.
   (a) Find the values of R_1 and R_2.
   (b) Now suppose that the load resistance of $200\,\Omega$ is connected across the output terminals (i.e., in parallel with R_2). Find the value of v_o.
6. (Hambley P2.42)
   We have a $60\,\Omega$ resistance, a $20\,\Omega$, and an unknown resistance R_x in parallel with a 15 mA current source. The current through the unknown resistance is 10 mA. Determine the value of R_x.
7. (Hambley P2.52)
   Determine the value of i_1 in Figure P2.52 using node voltages to solve the circuit. Select

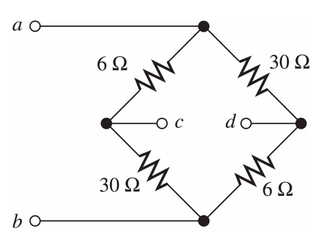

Figure P2.8

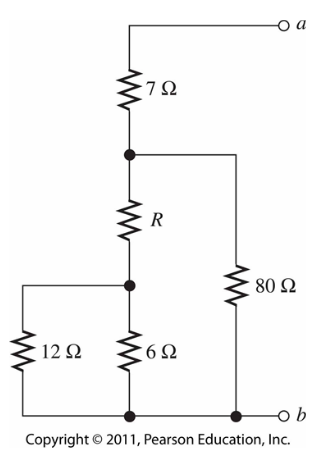

Figure P2.32

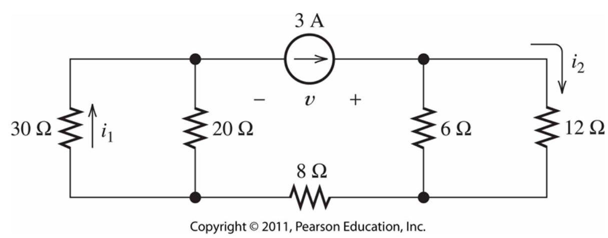

Figure P2.27

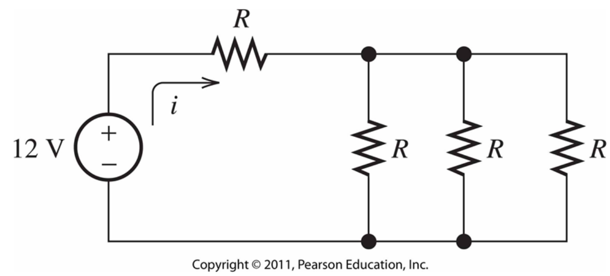

Figure P2.32

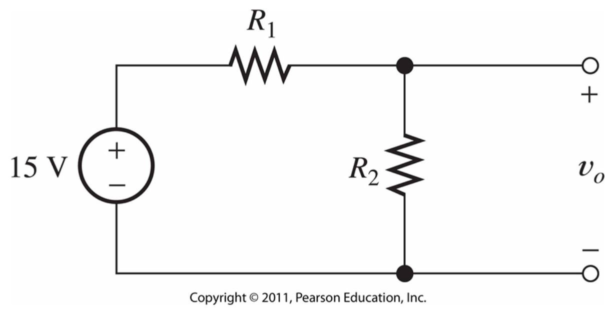

Figure P2.40

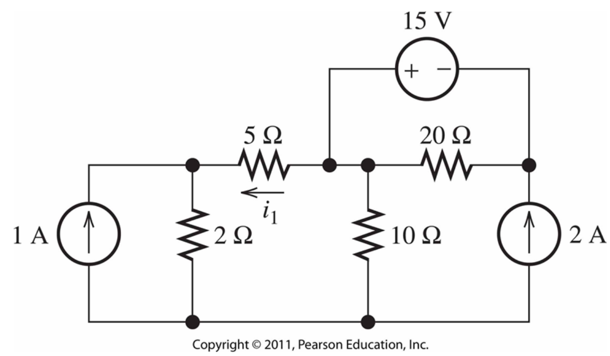

Figure P2.52

the location of the reference node to minimize the number of unknown node voltages. What effect does the 20 Ω resistor have on the answer? Explain.

8. (Hambley P2.58)
Solve for the power delivered to the 8 Ω resistance and for the node voltages shown in Figure P2.58.

9. (Hambley P2.68)
Solve for the power delivered by the voltage source in Figure P2.68, using the mesh-current method.

10. (Hambley 2.71)
Use mesh-current analysis to find the values of i_1 and i_2 in Figure P2.27. Select i_1 clockwise around the left-hand mesh, i_2 clockwise around the right-hand mesh, and i_3 clockwise around the center mesh.

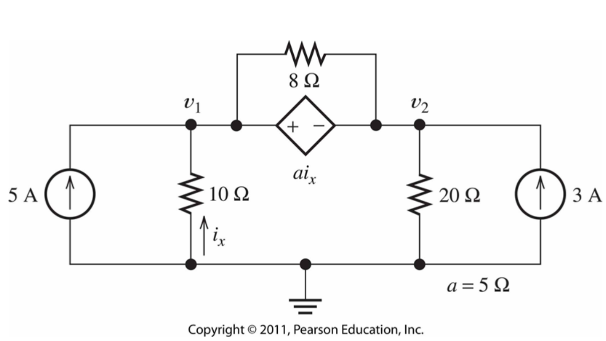

Figure P2.58

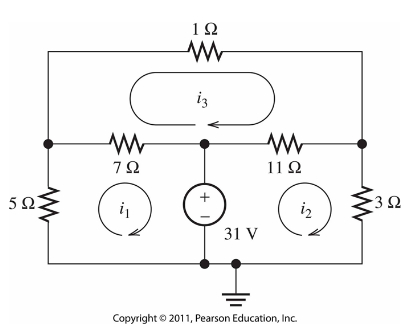

Figure P2.68