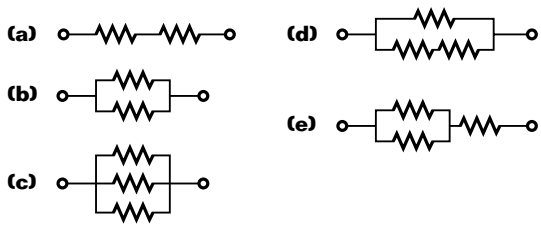
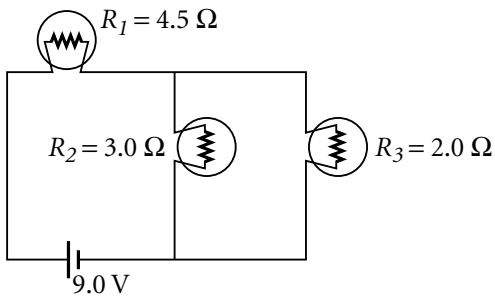
35. The figures **(a)–(e)** below depict five resistance diagrams. Each individual resistance is 6.0 Ω .

- **a.** Which resistance combination has the largest equivalent resistance?
- **b.** Which resistance combination has the smallest equivalent resistance?
- **c.** Which resistance combination has an equivalent resistance of 4.0 Ω ?
- **d.** Which resistance combination has an equivalent resistance of 9.0 Ω ?



36. Three small lamps are connected to a 9.0 V battery, as shown below.

- **a.** What is the equivalent resistance of this circuit?
- **b.** What is the current in the battery?
- **c.** What is the current in each bulb?
- **d.** What is the potential difference across each bulb?



37. An 18.0 Ω resistor and a 6.0 Ω resistor are connected in series to an 18.0 V battery. Find the current in and the potential difference across each resistor.

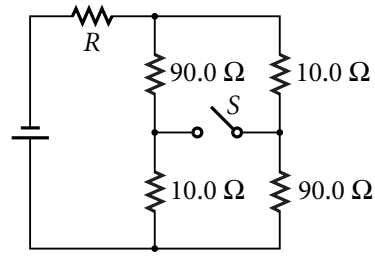
38. A 30.0 Ω resistor is connected in parallel to a 15.0 Ω resistor. These are joined in series to a 5.00 Ω resistor and a source with a potential difference of 30.0 V.

- **a.** Draw a schematic diagram for this circuit.
- **b.** Calculate the equivalent resistance.
- **c.** Calculate the current in each resistor.
- **d.** Calculate the potential difference across each resistor.

39. A resistor with an unknown resistance is connected in parallel to a 12 Ω resistor. When both resistors are connected to an emf source of 12 V, the current in the unknown resistor is measured with an ammeter to be 3.0 A. What is the resistance of the unknown resistor?

40. The resistors described in item 37 are reconnected in parallel to the same 18.0 V battery. Find the current in each resistor and the potential difference across each resistor.

41. The equivalent resistance for the circuit shown below drops to one-half its original value when the switch, *S*, is closed. Determine the value of *R*.



42. You can obtain only four 20.0 Ω resistors from the stockroom.

- **a.** How can you achieve a resistance of 50.0 Ω under these circumstances?
- **b.** What can you do if you need a 5.0 Ω resistor?

43. Four resistors are connected to a battery with a terminal voltage of 12.0 V, as shown below. Determine the following:

- **a.** the equivalent resistance for the circuit
- **b.** the current in the battery
- **c.** the current in the 30.0 Ω resistor
- **d.** the power dissipated by the 50.0 Ω resistor
- **e.** the power dissipated by the 20.0 Ω resistor

(Hint: Remember that $P = \dfrac{(\Delta V)^2}{R} = I\Delta V$.)