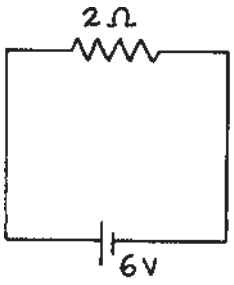
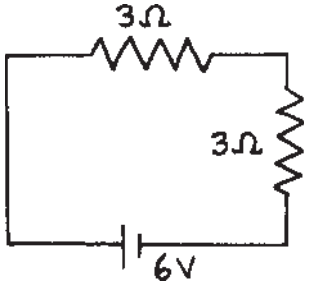
Name _____ Class _____ Date _____

Concept-Development Practice Page 35-1

Series Circuits

1. In the circuit shown at the right, a voltage of 6 V pushes charge through a single resistor of 2 Ω. According to Ohm's law, the current in the resistor (and therefore in the whole circuit) is _____ A.





2. If a second identical lamp is added, as on the left, the 6-V battery must push charge through a total resistance of _____ Ω. The current in the circuit is then _____ A.

3. The equivalent resistance of three 4-Ω resistors in series is _____ Ω.

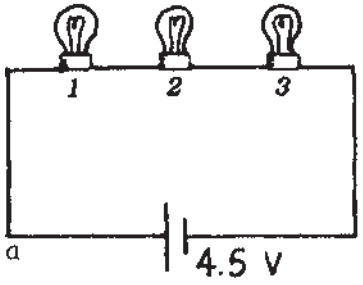
4. Does current flow *through* a resistor, or *across* a resistor? _____

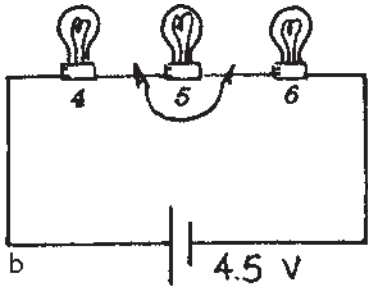
   Is voltage established *through* a resistor, or *across* a resistor? _____

5. Does current in the lamps occur simultaneously, or does charge flow first through one lamp, then the other, and finally the last in turn?

   _____

6. Circuits (a) and (b) below are identical with all bulbs rated at equal wattage (therefore equal resistance). The only difference between the circuits is that Bulb 5 has a short circuit, as shown.





   a. In which circuit is the current greater? _____

   b. In which circuit are all three bulbs equally bright? _____

   c. What bulbs are the brightest? _____

   d. What bulb is the dimmest? _____

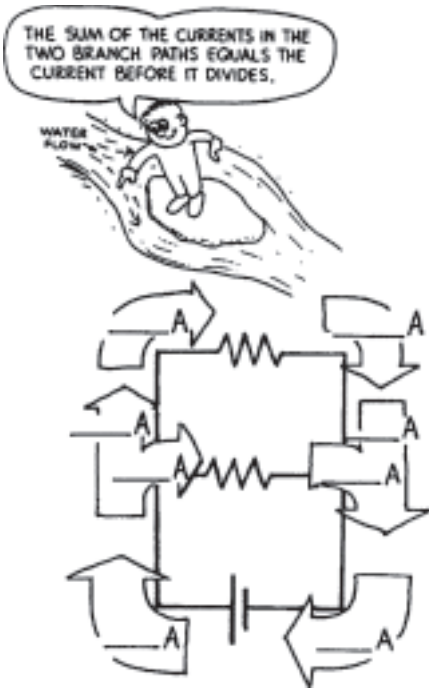
   e. What bulbs have the largest voltage drops across them? _____

   f. Which circuit dissipates more power? _____

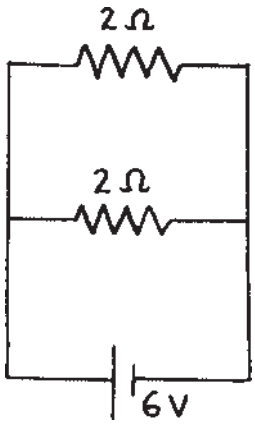
   g. What circuit produces more light? _____

CONCEPTUAL PHYSICS

Parallel Circuits



1. In the circuit shown below, there is a voltage drop of 6 V across *each* 2-Ω resistor.

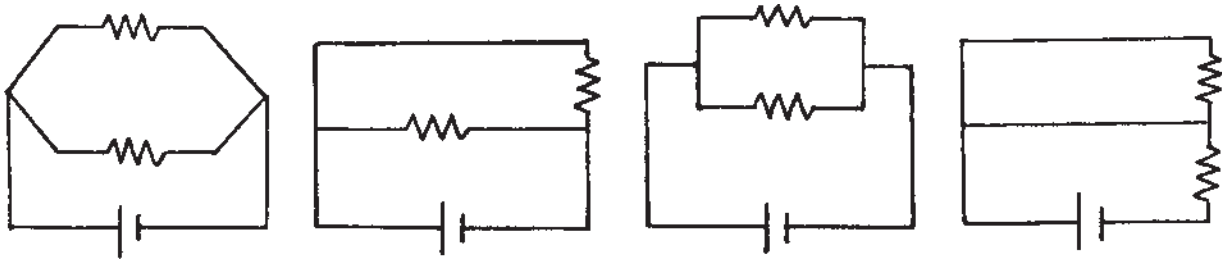


   a. By Ohm's law, the current in *each* resistor is _____ A.

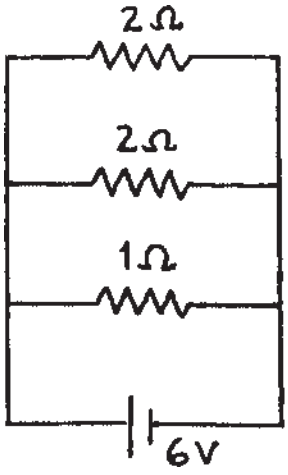
   b. The current through the battery is the sum of the currents in the resistors, _____ A.

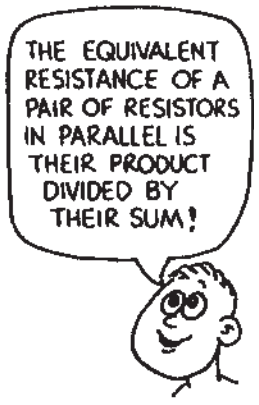
   c. Fill in the current in the eight blank spaces in the view of the *same circuit* shown again at the right.

2. Cross out the circuit below that is *not* equivalent to the circuit above.



3. Consider the parallel circuit at the right.





   a. The voltage drop across each resistor is _____ V.

   b. The current in each branch is:

      2-Ω resistor _____ A
      2-Ω resistor _____ A
      1-Ω resistor _____ A

   b. The current through the battery equals the sum of the currents which equals _____ A.

   c. The equivalent resistance of the circuit equals _____ Ω.