

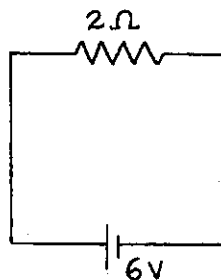
**Concept-Development
Practice Page**

35-1

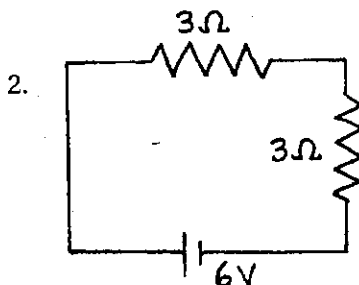
Series Circuits

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.



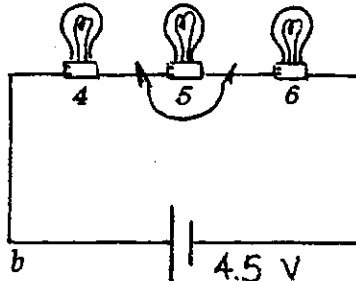
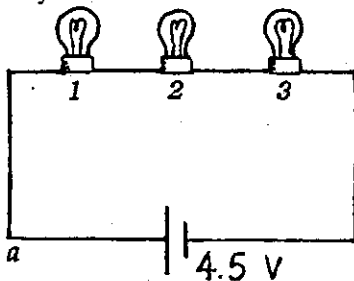
THE EQUIVALENT RESISTANCE OF RESISTORS IN SERIES IS SIMPLY THEIR SUM!



- 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.

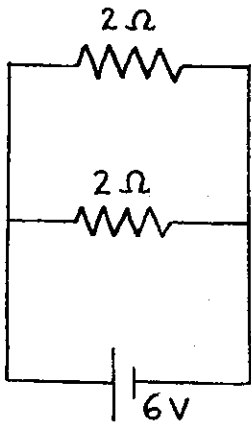


- a. In which circuit is the current greater? _____
- b. In which circuit are all three bulbs equally bright? _____
- c. What bulbs are the brightest? _____
- d. What bulb is the dimmest? _____
- e. What bulbs have the largest voltage drops across them? _____
- f. Which circuit dissipates more power? _____
- g. What circuit produces more light? _____

Conceptual PHYSICS

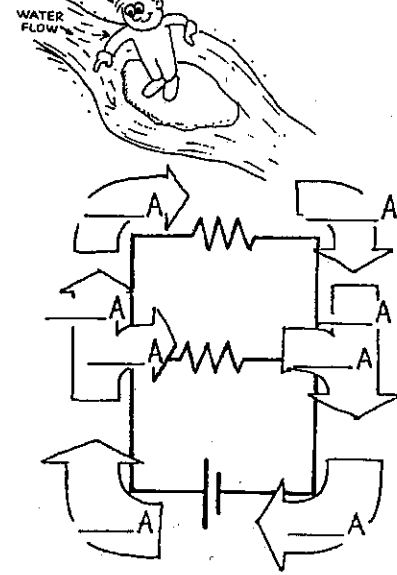
Parallel Circuits

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

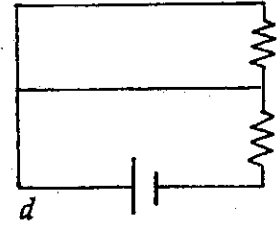
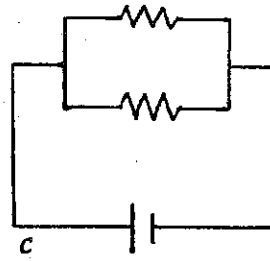
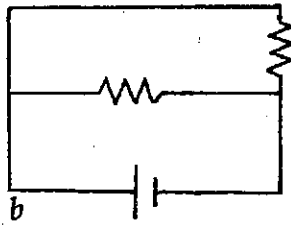
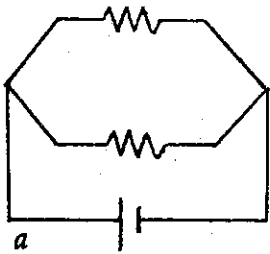


- By Ohm's law, the current in *each* resistor is _____ A.
- The current through the battery is the sum of the currents in the resistors, _____ A.
- Fill in the current in the eight blank spaces in the view of the *same* circuit shown again at the right.

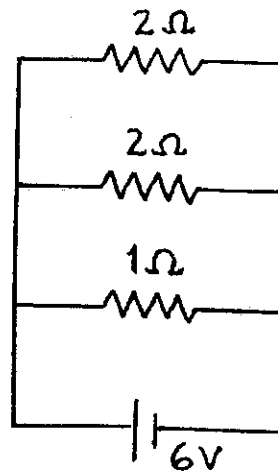
THE SUM OF THE CURRENTS IN THE TWO BRANCH PATHS EQUALS THE CURRENT BEFORE IT DIVIDES.



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



3. Consider the parallel circuit at the right.
- The voltage drop across each resistor is _____ V.
 - The current in each branch is:
 - 2-Ω resistor _____ A
 - 2-Ω resistor _____ A
 - 1-Ω resistor _____ A
 - The current through the battery equals the sum of the currents which equals _____ A.
 - The equivalent resistance of the circuit equals _____ Ω.



THE EQUIVALENT RESISTANCE OF A PAIR OF RESISTORS IN PARALLEL IS THEIR PRODUCT DIVIDED BY THEIR SUM!

