

Electric Math

1. Two pith balls have an equal amount of electrical charge, but are oppositely charged (one is electrically positive; the other is electrically negative). What will happen? Explain your answer.
2. There is a 22-ohm resistance in the heating element of a coffee percolator. It is plugged into a 110-volt circuit. How much current passes through the heating element?
3. A lamp operates at 115 volts with a current of 0.25 ampere. What is the lamp's resistance?

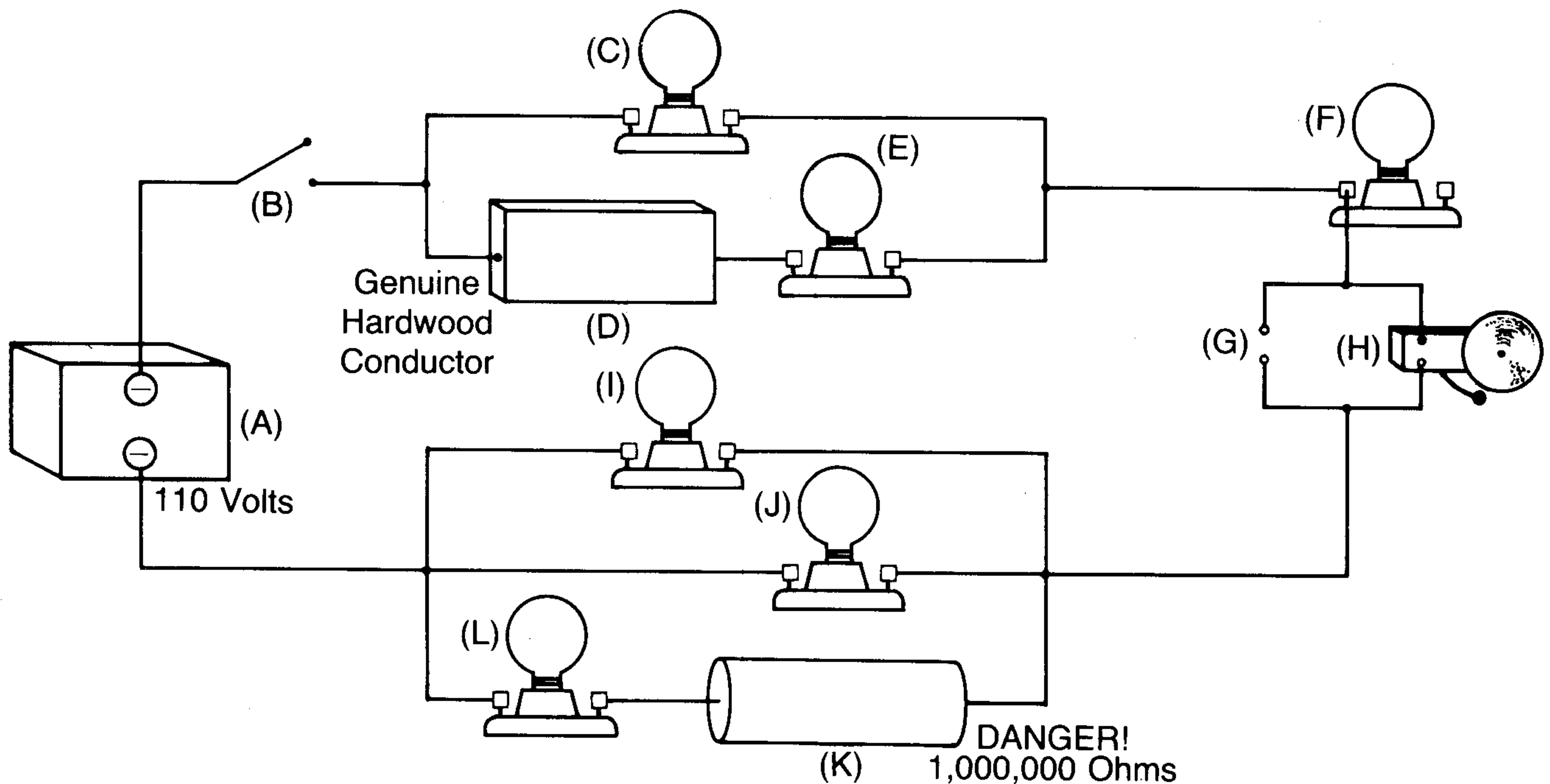
A four-horsepower electric motor uses a current of 16 amps in a 230-volt system. 746 watts = 1 horsepower (hp).

4. What electric power can the motor ideally deliver?
5. How many watts does this 4 hp motor actually supply? (Convert 4 hp to watts.)
6. An electric stove has a resistance of 10 ohms. If it is in a 120-volt circuit and the cost per kilowatt hour (kWh) is 20 cents, what is the cost of using this stove for 5 hours?
7. If a 6-volt battery with an internal resistance of 2 ohms is connected in series to resistances of 8 and 14 ohms, respectively, what is the amount of the current that is flowing.
8. Five resistances of 8, 4, 2, 6, and 10 ohms each are connected in series. What is the total resistance?

Three lamps with 40, 60, and 80 ohms of resistance are connected in parallel to a 120-volt circuit.

9. What current flows through each lamp?
10. What is the total resistance of the three lamps?
11. What is the total current used by the three lamps?

Electric Circuitry



1. Five parts of this circuit are *not* correct. Identify these parts by their letter and explain why they are incorrect.

2. Change (A) so that the voltage source will work.

3. What must be done to complete the circuit?

For questions 4–8, assume that the electric circuit is complete.

4. Which lamps will be lit? _____

5. Will electric bell (H) ring? _____

6. Will lamp (C) remain lit if lamp (E) is removed? _____

7. Will lamp (I) be lit if lamp (C) is removed? _____

8. Will lamp (C) be lit if lamp (I) is removed? _____

9. Are lamps (I), (J), and (L) arranged in series or parallel? _____

10. How are lamps (C), (F), and electric bell (H) arranged? _____