Ohm's Law

Solve the following problems with proper form.

1. What resistance would produce a current of 200 amperes with a potential difference of 2 000 volts?   (10 ohms)

2. What is the resistance of a light bulb if a 120-volt potential difference produces a current of 0.8 amperes?   (150 ohms)

3. What voltage produces a current of 50 A with a resistance of 20 ohms?   (1 000 V)

4. Silver has a resistance of 1.98×10^{-4} ohms. What voltage would produce a current of 100 A? (0.019 8 V)

5. What voltage would produce a current of 500 A with a resistance of 50 ohms? (25 000 V)

6. What is the current produced with a 9-volt battery through a resistance of 100 ohms? (0.09 A)

7. Find the current when a 12-volt battery is connected through a resistance of 25 ohms. (0.48 A)

8. What is the current produced by a potential difference of 240 volts through a resistance of 0.2 ohms? (1 200 A)

9. What resistance would produce a current of 120 A from a 6-volt battery? (0.05 Ω)

10. What voltage is necessary to produce a current of 200 A through a resistance of 1.0×10^{-3} ohms? (0.2 V)

11. What is the current produced by a 9-volt battery flowing through a resistance of 2×10^{-4} ohms?   (45 000 A)

12. What is the potential difference if a resistance of 25 ohms produces a current of 250 amperes?   (6 250 V)

Power

1. A 6-volt battery produces a current of 0.5 A. What is the power of the circuit? (3 W)

2. A 100-watt light bulb is operating on 1.2 A of current. What is the voltage? (83 V)

3. A potential difference of 120 volts is operating a 500-watt microwave oven. What is the current being used? (4.2 A)

4. A light bulb uses 0.625 A from a source of 120 volts. How much power is used by the bulb? (75 W)

5. What voltage is necessary to run a 500-watt motor with a current of 200 amperes? (2.5 V)

Calculating Electrical Energy and Cost

One kilowatt hour is 1 000 watts of power for one hour of time.
The abbreviation for kilowatt hour is kWh.

1. A coffee pot operates on 2 amperes of current on a 110-volt circuit for 3 hours. Calculate the total kWh used. (0.66 kWh)

2. A microwave oven operated on 5 amperes of current on a 110-volt circuit for one hour. Calculate the total kilowatt hours used. (0.55 kWh)

3. How much would it cost to run the microwave in problem 2 if the cost of the energy is $0.10 per kWh? ($ 0.06)

4. An electric stove operates on 20 A of current on a 220-volt circuit for one hour. Calculate the total kilowatt hours used. (4.4kWh)

5. What is the cost of using the stove in problem 4 if the cost of energy is $0.10 per kWh? ($ 0.44)

6. A refrigerator operates on 15 A of current on a 220-volt circuit for 18 hours per day. How many kilowatt hours are used per day? (59.4 kWh)

7. If the electric costs were $0.15 per kWh, how much does it cost to run the refrigerator in problem 6? ($ 8.91)