Power in Circuits **Name** _____

Physics II **Date** _____

1. Your oven has a power rating of 5000 watts.
   (a) How many kilowatts is this? _____
   (b) If the oven is used for 2 hours to bake cookies, how many kilowatt-hours (kWh) of energy are used? _____
   (c) If your town charges \$0.15/kWh, what is the cost to use the oven to bake the cookies? _____

2. You use a 1200-watt hair dryer for 10 minutes each day.
   (a) How many minutes do you use the hair dryer in a month? (Assume there are 30 days in the month.) _____
   (b) How many hours do you use the hair dryer in a month? _____
   (c) What is the power of the hair dryer in kilowatts? _____
   (d) How many kilowatt-hours of electricity does the hair dryer use in a month? _____
   (e) If your town charges \$0.15/kWh, what is the cost to use the hair dryer for a month? _____

3. Calculate the power rating of a home appliance (in kilowatts) that uses 8 amps of current when plugged into a 120-volt outlet. _____

4. Calculate the power of a motor that draws a current of 2 A when connected to a 12 volt battery. _____

5. Your alarm clock is connected to a 120 volt circuit and draws 0.5 A of current.
   (a) Calculate the power of the alarm clock in watts. _____
   (b) Convert the power to kilowatts. _____
   (c) Calculate the number of kilowatt-hours of electricity used by the alarm clock if it is left on for one year. _____
   (d) Calculate the cost of using the alarm clock for one year if your town charges \$0.15/kWh. _____

6. Using the formula for power, calculate the amount of current through a 75-watt light bulb that is connected to a 120-volt circuit in your home. _____

7. A toaster is plugged into a 120-volt household circuit. It draws 5 amps of current.
   (a) What is the resistance of the toaster? _____
   (b) What is the power of the toaster in watts? _____
   (c) What is the power in kilowatts? _____

8. A clothes dryer in a home has a power of 4,500 watts and runs on a special 220-volt household circuit.
   (a) What is the current through the dryer? _____
   (b) What is the resistance of the dryer? _____
   (c) How many kilowatt-hours of electricity are used by the dryer if it is used for 4 hours in one week? _____
   (d) How much does it cost to run the dryer for one year if it is used for 4 hours each week at a cost of \$0.15/kWh? _____

9. A circuit contains a 12-volt battery and two 3-ohm bulbs in series.
    (a) Calculate the total resistance of the circuit.
    (b) Calculate the current in the circuit.
    (c) Calculate the power delivered to each bulb.
    (d) Calculate the power supplied by the battery.
10. A circuit contains a 12-volt battery and two 3-ohm bulbs in parallel.
    (a) What is the voltage across each branch?
    (b) Calculate the current in each branch.
    (c) Calculate the power delivered to each bulb.
    (d) Calculate the total current in the circuit.
    (e) Calculate the power supplied by the battery.