

Fight the Power

(Don't really fight it, just calculate it)

1. A 12 volt battery has a $150\ \Omega$ resistor connected across its terminals.
 - a. Calculate the current through the resistor.
 - b. Calculate the power for the resistor.
 - c. Determine the amount of energy dissipated in 20 minutes of use.

2. An appliance is rated for 2.5 A at 120 V.
 - a. Calculate the electric power required.
 - b. Determine the effective resistance of the appliance.

3. A hair dryer is rated for 1200 W at 120 V.
 - a. Determine the amount of current the dryer draws.
 - b. Determine the effective resistance of the dryer.

4. Two resistors of $100\ \Omega$ and $25\ \text{k}\Omega$ are rated for maximum wattages of 1.5 W and 0.25 W respectively. Calculate the maximum current for each.

5. What is the maximum power consumption of a 9.0 V transistor radio that draws a maximum of 400 mA of current?

6. A toaster that draws 5 amps of current when plugged into a 120-volt wall socket.
 - a. Calculate the resistance in the toaster.
 - b. Determine the amount of energy used if the toaster is on for 2.0 minutes.

7. Sketch the graphs that would show each of the following relationships:
 - a. Power vs. Voltage with resistance constant.
 - b. Power vs. Voltage with current constant.
 - c. Power vs. Current with voltage constant.
 - d. Power vs. Current with resistance constant.