Resistance and Ohm's Law

1. The resistance of your body can vary a great amount, depending on how dry or sweaty you are.
   a. If the resistance of your body was 100,000 Ω, how much current would flow through your body if you touched the ends of a 24 volt potential?

   b. What would be your resistance if your body drew 0.1 amp of current from a 48 V potential? (This current through your heart would probably kill you.)

2. A 75 W light bulb is in a 120 V outlet.
   a. What is the current drawn by the light bulb?

   b. What is the resistance of the light bulb?

   c. How many electrons would pass through the light bulb in one hour?

3. There is a current of 3 amps passing through a 25 Ω resistor.
   a. What is the potential difference across the resistor?

   b. What power is dissipated by the resistor?

   c. How much energy is dissipated by the resistor in 30 minutes?

4. A hair dryer is plugged into a 120 V outlet and draws 4 amps of current.
   a. What is the power of the hair dryer?

   b. What is the resistance of the hair dryer?

*5. A flashlight has a 10 W bulb in it with a resistance of 2.03 Ω when it is lit.
   a. What current would the bulb draw?

   b. How many 1.5 V batteries would be needed for this flashlight?

Answers: *1.a) 0.00024 A b) 480 Ω 2.a) 0.63 A b) 192 Ω c) 1.42 x 10^{22} 3.a) 75 V b) 225 W c) 405,000 J 4.a) 480 W b) 30 Ω 5.a) 2.22 A b) 4.5 V; 3 batteries*