Ohm's Law Story Problems

Ohm's Law states that the voltage in a circuit is directly related to the current flowing through the circuit and the resistance provided by the circuit. Voltage is defined as the potential energy difference from one end of the circuit to the other. Voltage is similar to water pressure. It measures how much energy is pushing the electrons through the wire. **Voltage is measured in volts**. Current is defined as the amount of electricity flowing through a circuit. The more electrons go through the wire, the higher the current. **Current is measured in amperes**, sometimes called amps. Resistance is a property of the circuit itself. It is a measure of the difficulty of the path that the electrons are following. **Resistance is measured in ohms.** The equation $V=I \cdot R$ describes the relationship between the voltage on a circuit, the current flowing through it and the resistance of the circuit. **The V stands for voltage, I for current (Inductant)** and **R for resistance**. The equation can be used to solve for voltage in story problems when current and resistance are given. The equation can be re-arranged to solve for other variables. The equation to use, when solving for current is $I = V / R$. resistance can be solved for using the equation $R = V / I$.

To review, the three forms of the velocity equation are:

$$\mathbf{V = I \cdot R} \qquad \mathbf{I = V / R} \qquad \mathbf{R = V / I}$$

1. A small electrical pump is labeled with a rating of 3 amps and a resistance of 40 ohms. What voltage was it meant to run at?

2. A nine volt battery is hooked up to a light bulb with a rating of three ohms. How much current passes through the light?

3. A lamp is plugged into the wall outlet, which is providing 110 volts. An ammeter attached to the lamp shows 2 amps flowing through the circuit. How many ohms of resistance is the lamp providing?

4. If your skin has a resistance of 100,000 ohms, and you touch a 9-volt battery, what current will flow through you?

5. What current will flow through you if you touch 120-volt house potential?

6. Soaked in seawater, your resistance is lowered to 100 ohms. Now how much current will flow through you if you touch the 9-volt battery?

7. Soaked in seawater, what current will flow through you if you touch the 120-volt house potential?

1. 120 Volts 2. 3Amps 3. 55 Ohms 4. .00009 amps 5. .012 amps 6. .09 amp 7. 1.2 amp