Ohm's Law Practice Worksheet

An alarm clock draws 0.5 A of current when connected to a 120 volt circuit. Calculate its resistance.

$$R = \frac{V}{I} = \frac{120}{0.5} = 240 \ \Omega$$

A subwoofer needs a household voltage of 110 V to push a current of 5.5 A through its coil. What is the resistance of the subwoofer?

$$R = \frac{V}{I} = \frac{110}{5.5} = 20 \ \Omega$$

A walkman uses a standard 1.5 V battery. How much resistance is in the circuit if it uses a current of 0.01A?

$$R = \frac{1.5}{0.01} = 150 \ \Omega$$

A circuit contains a 1.5 volt battery and a bulb with a resistance of 3 ohms. Calculate the current.

$$I = \frac{V}{R} = \frac{1.5}{3} = 0.5 \ A$$

What current flows through a hair dryer plugged into a 120 Volt circuit if it has a resistance of 25 ohms?

$$I = \frac{120}{25} = 4.8 \ A$$

What happens to the current in a circuit if a 1.5-volt battery is removed and is replaced by a 3-volt battery?

Double

If a toaster produces 12 ohms of resistance in a 120-volt circuit, what is the amount of current in the circuit?

$$I = \frac{V}{R} = \frac{120}{12} = 10 \ A$$

A 12 Volt car battery pushes charge through the headlight circuit resistance of 10 ohms. How much current is passing through the circuit?

$$I = \frac{12}{10} = 1.2 \ A$$

How much voltage would be necessary to generate 10 amps of current in a circuit that has 5 ohms of resistance?

$$V = IR = 10 \times 5 = 50 \ V$$

An electric heater works by passing a current of 100 A though a coiled metal wire, making it red hot. If the resistance of the wire is 1.1 ohms, what voltage must be applied to it?
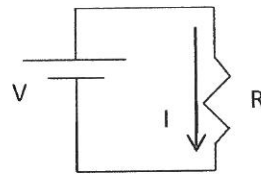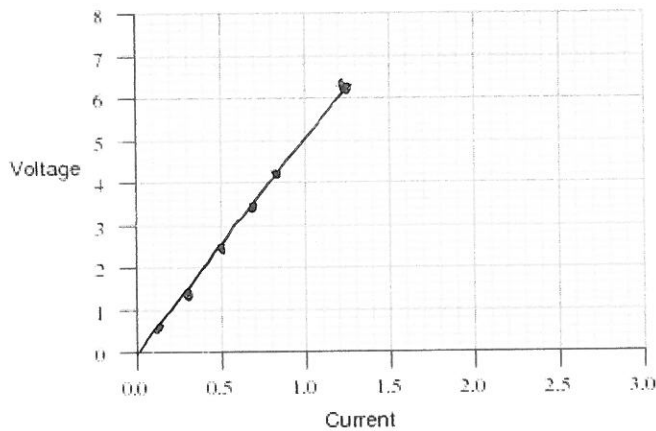
$$V = IR = 100 \times 1.1 = 110 \ V$$

A light bulb has a resistance of 5 ohms and a maximum current of 10 A. How much voltage can be applied before the bulb will break?

$$V = 10 \times 5 = 50 \ V$$

What happens to the current in a circuit if a 10Ω resistor is removed and replaced by a 20Ω resistor?

Halved

Suppose you did a lab with this simple circuit and got the following data. Plot the points of the provided graph.

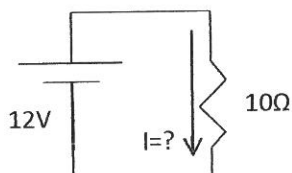| Voltage (V)	Current (A)
0.65	0.12
1.41	0.29
2.55	0.51
3.28	0.67
4.11	0.81
6.15	1.23

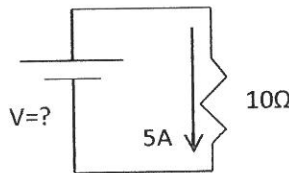What mathematical relationship do you see between voltage and current?

Linear $V = IR$

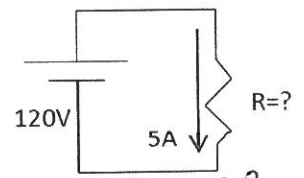Is the resistance constant?

Yes, gradient constant

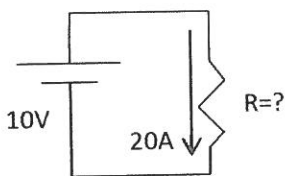Solve for the unknown in each of these circuits

12V, 10Ω, I=?

$$I = \frac{12}{10} = 1.2 A$$

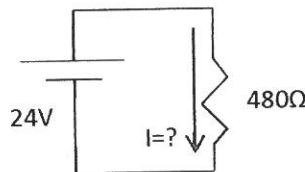V=?, 10Ω, 5A

$$V = 5 \times 10 = 50 V$$

120V, 5A, R=?

$$R = \frac{120}{5} = 24 \Omega$$

10V, 20A, R=?

$$R = \frac{V}{I} = \frac{10}{20} = 0.5 \Omega$$

24V, I=?, 480Ω

$$I = \frac{24}{480} = 0.05 A$$

V=?, 1A, 150Ω

$$V = 150 \times 1 = 150 V$$