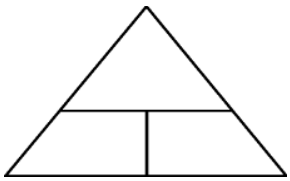
Current Electricity – Review

Name: _____ Date: _____

Ohm's Law:

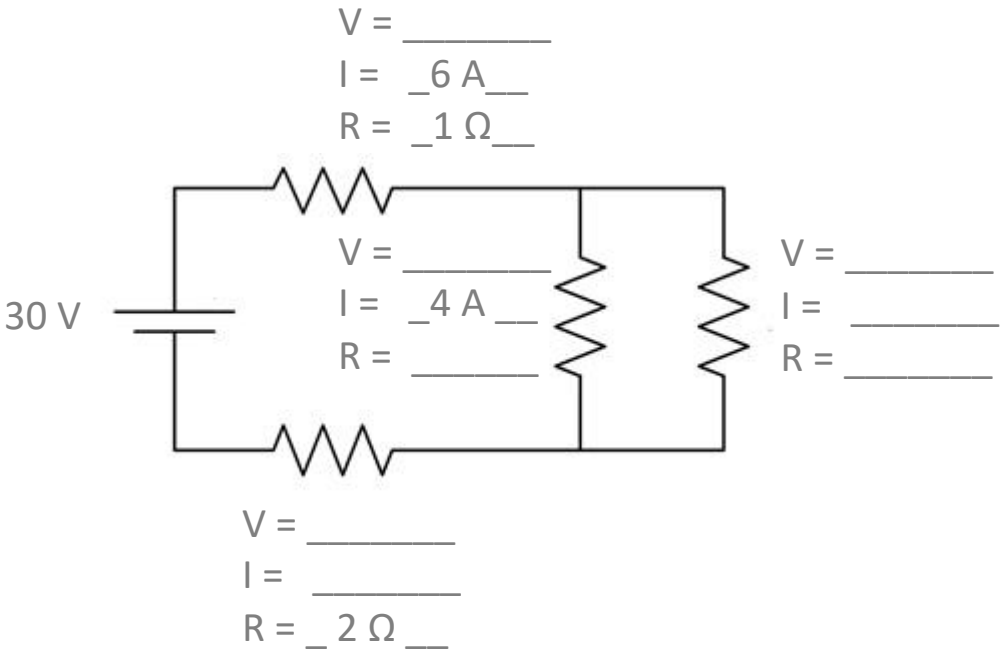


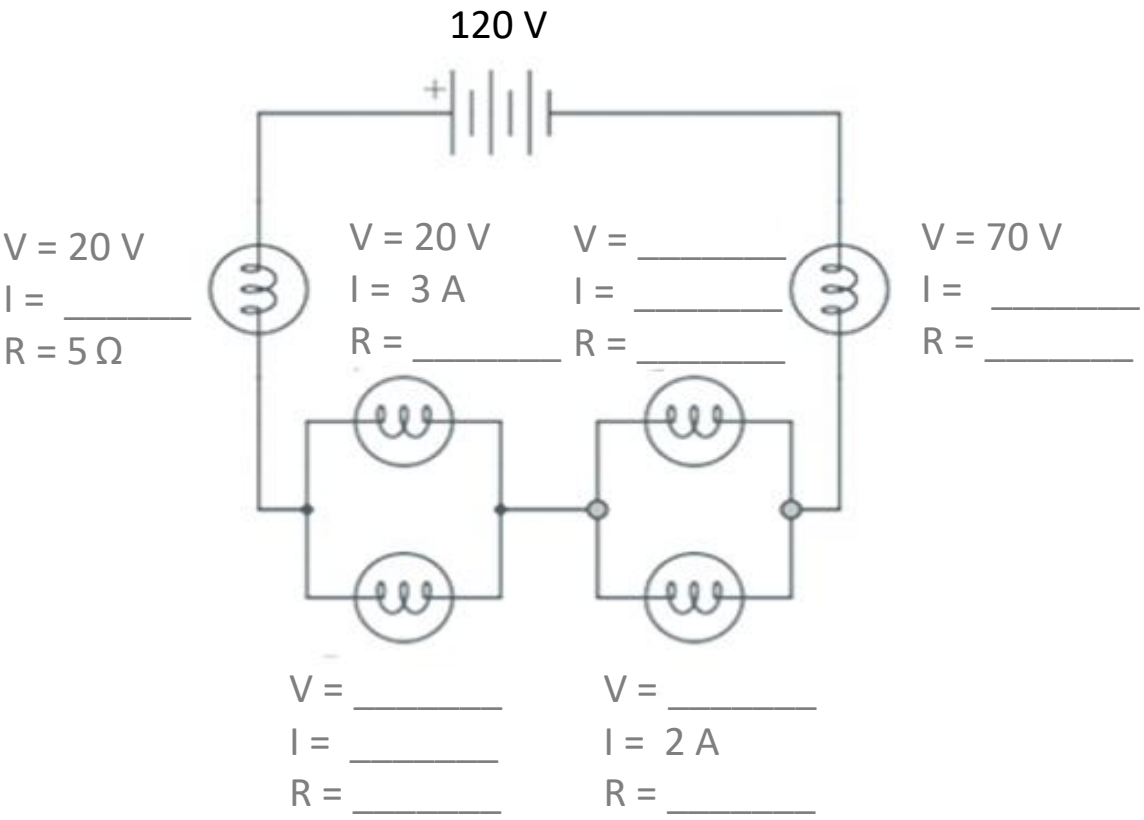
1. A circuit is set up with a 20 Ω resister and a 15 V battery. Calculate the current in the circuit.

2. A circuit is set up with three 5 Ω resistors in series. The current in the circuit was measured to be 2 A. Calculate the voltage of the power source.

3. A circuit has a lightbulb set up in it. The current in the circuit was measured to be 4 A and the voltage was 120 V. Calculate the resistance of the light bulb.

4. Complete the following diagrams using **Ohm's Law**.





Power & Energy:

1. A circuit delivers 59080 J of energy in 1.5 minutes. Calculate the power of the circuit.

2. A circuit delivers 80 W of power and delivers 700 J of energy. Calculate the time that this power was delivered for.

3. A 20 Ω resistor is placed in a circuit. A current of 3 A is passed through the circuit. Calculate the power in the circuit.

Efficiency:

$$\%efficiency = \frac{useful\ Energy\ Input}{Energy\ Output} \times 100\%$$

1. An appliance receives 750 J of energy. It is able to output 67 J of energy. Calculate the efficiency.

2. An appliance has an efficiency of 60%. The appliance outputs 945 J of energy. How much energy was input into the appliance?

Electricity Costs:

$$COST = \boldsymbol{Power}\ (kW) \times \boldsymbol{Time}\ (h) \times \boldsymbol{rate}\ (\frac{\$}{kWh})$$

1. A blow dryer has a power rating of 300 W. If it takes you 10 minutes to dry your hair every day and the cost of electricity is $0.07 per kWh (off-peak), how much do you spend to dry your hair for the month of July?

2. A large industrial appliance is rated at 2300 W. It is powered on when the rate of electricity costs $0.10 per kWh. You determine that it costs you $0.46 (46 cents) to run the appliance. Calculate how long the appliance was on for.

3. A dishwasher is used for 4 hours per day for one year. The dishwasher draws 6 A of current and has a potential of 120 V. If the electricity rate is $0.20 per kWh, calculate the cost to run the dishwasher every day.

Drawing Circuit Diagrams:

Draw a circuit diagram for each scenario below.

1. A 20 V battery is powering a strand of 6 consecutive Christmas tree light bulbs. The strand is a closed circuit but has an on/off switch that allows the user to turn the lights off when not in use. Show the direction of electron flow as well. Also, place an ammeter in the circuit and measure the voltage across one of the bulbs.

2. Two 9 Volt batteries are connected to each other consecutively. The circuit contains one resistor and two lightbulbs all in parallel. After this there is a switch and an ammeter.

3. This circuit has two batteries in parallel that are then followed by a light bulb and then two resistors in parallel and then another light bulb followed by a switch.