

## Circuit Electricity

1. What is the mathematical relationship between  $V$  and  $I$ . (Hint: Look up equation and cross multiply to separate variables)

2. All resistors connected in series have the same \_\_\_\_\_ (see equations)

3. All resistors connected in parallel have the same \_\_\_\_\_ (see equations)

4.  $V_T = 30\text{ V}$   $R_1 = 60\text{ ohms}$   $R_2 = 15\text{ ohms}$

**a) Draw this circuit connected in Series**

Find  $R_T$ ,  $I_T$ ,  $I_1$ ,  $I_2$ ,  $V_1$ ,  $V_2$

**b) Draw this circuit connected in Parallel**

Find  $R_T$ ,  $I_T$ ,  $I_1$ ,  $I_2$ ,  $V_1$ ,  $V_2$

5. Connect an **ammeter** to each circuit above in a position where it will measure the total current.

6. Connect an **voltmeter** to each circuit above in a position where it will measure the voltage of the first resistor.

7. Adding resistors "in series" to an existing circuit will INCREASE or DECREASE the total resistance. (see equations)

8. Adding resistors "in parallel" to an existing circuit will INCREASE or DECREASE the total resistance. (see equations)

9. An electric heater rated at 600 watts is operated on 120 volts. How much energy is used in 5 seconds?

10. a) Power is the \_\_\_\_\_ of doing work. b) The current in a resistor is 3.0 A, and its resistance is 10 ohms. What is the power developed in the resistor ?

11. Some Christmas lights are designed so that when one light bulb goes out, the rest of them stay on. What kind of circuit is this?

12. What is the total resistance of a parallel circuit with a 2 ohms, 3 ohms and 4 ohms?