NAME: _____

Lab 29-4: **Compound Circuit**

Purpose: 1. To calculate the voltages and currents for individual resistors in a compound circuit.
2. To calculate the actual equivalent resistance of a compound circuit.
3. To calculate the ideal equivalent resistance of a compound circuit.
4. To determine what happens to voltage, current and resistance in a compound circuit.
5. To apply the ideas of conservation of charge and conservation of energy to a compound circuit.

Procedure:
1. Hook up the circuit shown in the diagram below.
2. Set the power supply for about 1 volt. (The exact number does not matter.)
3. Measure the current and voltage for each resistor in the circuit and record in the data table.
4. Measure the total voltage and total current using your portable meters.

Remember:	*Ammeters are connected in series.*	*Voltmeters are connected in parallel.*

Diagram:

Data:

	R	V	I
R_1	3 Ω		
R_2	5 Ω		
R_3	3 Ω		

$V_{power\ supply}$	
$I_{power\ supply}$	

Questions:
1. From your measured total voltage and total current, calculate the equivalent resistance of your compound circuit.

2. By first finding the equivalent resistance for R_2 and R_3, calculate the ideal equivalent resistance of your circuit. How does your answer compare to your answer for #1?

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3. Two resistors should have the same voltage drop across them. Which ones are they? Why?

4. The current of two resistors added up should be equal to the current of the third resistor. Which resistor is equal to the sum of the other two? Why?

5. The sum of the voltage drops across R_1 and R_2 should be the same as the total voltage. Why does that work? What about the voltage drop across R_3?

6. The current in R_1 should be the same as the total current. Explain.

7. Suppose you accidentally hooked up the ammeter as shown in the diagram below. What would happen? Calculate the voltage and current for each resistor.

3 volts