Lab 29-3: **Parallel Circuits**

Purpose:
1. To calculate the voltages and currents for individual resistors in a parallel circuit.
2. To calculate the equivalent resistance of a parallel circuit.
3. To determine what happens to voltage, current and resistance in a parallel circuit.

Procedure:

Circuit 1: Two resistors in parallel.

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 the 3 Ω resistor and record in the data table below the diagram.
4. Repeat measurements for the 5 Ω resistor.
5. Measure the total voltage and total current using your portable meters. (The meters on the power supplies are not as accurate as the portable meters.)

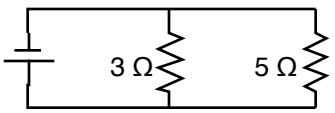
Circuit 2: Three resistors in parallel.

1. Hook up the circuit shown in the diagram below.
2. Repeat your procedure from Part I, recording your results in the data table below the diagram.

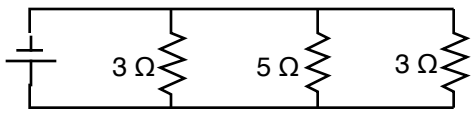
Remember: *Ammeters are connected in series.* *Voltmeters are connected in parallel.*

Diagrams:

Circuit 1



Circuit 2



Data:

Circuit 1		
R	**V**	**I**
3 Ω		
5 Ω		

$\mathbf{V}_{\text{power supply}}$	
$\mathbf{I}_{\text{power supply}}$	

Circuit 2		
R	**V**	**I**
3 Ω		
5 Ω		
3 Ω		

$\mathbf{V}_{\text{power supply}}$	
$\mathbf{I}_{\text{power supply}}$	

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Questions:

1. For each circuit, compare the current from the power supply to the current passing through the individual resistors.

2. For each circuit, compare the total voltage coming from the power supply to the voltages of each individual resistor.

3. Calculate the total equivalent resistance for each circuit by $R_{equivalent} = \frac{V_{power\ supply}}{I_{power\ supply}}$.

4. For each circuit, compare the equivalent resistance just calculated to the individual resistors.

5. With calculations, show that $\frac{1}{R_{equivalent}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \cdots$ in a parallel circuit.

6. In general, what happens to voltage, current, and resistance in a parallel circuit?