Lab 5:

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1 Purpose

Familiarity with the behavior of resistors in both series and parallel configurations. Experimental verification of course material and calculations of series and parallel resistors.

2 Materials

- Handheld Digital Multimeter (DMM)
- Breadboard
- Assorted Resistors (270Ω, 330Ω, and 510Ω)
- Power Supply
- Wires
- Alligator Clips

3 Theory

Resistors in series

$$R_{eq} = R_1 + R_2 + R_3$$

The total Voltage across resistors in series is equal to the sum of voltage drops across each subsequent resistor.

$$V_{eq} = \varepsilon = V_1 + V_2 + V_3 = IR_1 + IR_2 + IR_3$$

Resistors in parallel

$$R_{eq} = \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_2}\right)$$

The voltage drop across each resistor in a parallel setup is equal to the potential difference of the battery ε.

$$V_{eq} = \varepsilon = V_1 = V_2 = V_3$$

4 Experiment Analysis

When we have resistors in parallel, the potential difference across them are the same.

5 Procedure

5.1 Measurement of the resistors using DMM

5.2 Series Circuit

5.3 Parallel Circuit

6 Data and Graphs

6.1 Part 1

6.2 Part 2

6.3 Part 3

7 Calculations & Results

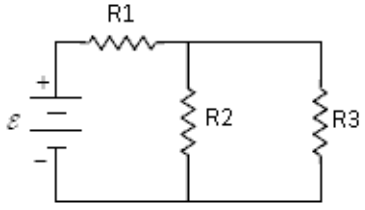
7.1 Part 1

For calculating the equivalent resistance

7.2 Part 2

8 Questions

Figure 1: Series and parallel circuit diagram



9 Conclusion