

## Lab 5:

Zachary Pouska  
001103193

Natalie Tran  
000698629

PHYS 236 | Fall 2022  
Date performed: 24/10/2022

# 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 ( $270\Omega$ ,  $330\Omega$ , and  $510\Omega$ )
- 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  $\varepsilon$ .

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

# 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

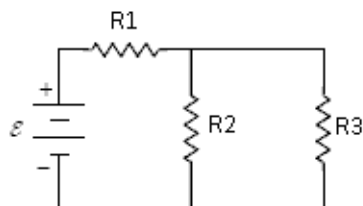
### 7.1 Part 1

For calculating the equivalent resistance

### 7.2 Part 2

## 8 Questions

Figure 1: Series and parallel circuit diagram



## 9 Conclusion