Math 243 **Homework 5 - Sets**

We met up on Pi-Day (March 14, 2023) to celebrate the wonderful day of Pi and wanted to come together and complete the homework. Everyone met accordingly and contributed ideas and discussed thoughts on how to tackle the problems. Lucas contributed heavily on problem three, Matthew worked on problem one while Emma and Jorge wrote out every possible combination for problem two and figured out the formula that was asked in problem 2c. In short, everyone was putting in effort and we all ate pie to celebrate.

Problem 1

1. Consider the following sets:

$$A = \{n \in \mathbb{Z}^+ : \text{n is odd}\}$$
$$B = \{m \in \mathbb{Z}^+ : \text{m is prime}\}$$
$$C = \{4\text{p}+3 : \ p \in \mathbb{Z}^+\}$$
$$D = \{x \in \mathbb{R} : x^2 - 8x + 15 = 0\}$$

For each set in the list, discuss whether or not it is a subset of each of the other sets in the list, and why. Draw a Venn diagram to illustrate the relationships among all four sets.

- A is not a subset of B because there exist odd integers that are not prime (ie. 9, 15, etc).
- A is not a subset of C because not all odd integers are of the form $4p + 3$.
- A is not a subset of D because set D only contains two values while set A has an infinite amount of values.