Ideas in Mathematics
Math 170, Spring 2016
Quiz 1

1. Indicate whether each is a real mathematical subject. If the subject is real but the description is incorrect, please write a correct description.

   (a) Number theory – studies whole numbers such as 2, 17, and 1729.

   _____

   (b) Graph theory – studies how networks of points can be connected.

   _____

   (c) Knot theory – studies different ways in which knots can be tied.

   _____

   (d) Group theory – studies sets in which elements can be combined.

   _____

   (e) Braid theory – studies ways in which several strings can be braided.

   _____

2. Some numbers can be written as the product of two positive whole numbers greater than 1. For example, $6 = 2 \times 3$ and $42 = 6 \times 7$. These numbers are called **composite** numbers. Other numbers such as 17 and 2297, cannot be written like that. These are called **prime** numbers.

   - List five prime numbers: _____, _____, _____, _____, _____
   - How many prime numbers are there?
     (a) around 1000
     (b) around 1,000,000
     (c) More than 10^{10}.
   - Please explain your answer.

     _____

     _____

3. A rational number is one that can be written a/b, where both a and b are whole numbers. For example, 1.5 is a rational number because it can be written as 3/2. Indicate whether each of the following is a rational number, and explain why you think that or how you know that:

   (a) 10

   (b) 5.2

   (c) $\sqrt{2}$

   (d) The circumference of a circle divided by its diameter (i.e., π)

4. What were the most challenging parts of your elementary and high school math classes?

5. What were your favorite parts, if any, of your elementary and high school math classes?