Math-1003b Homework #1

Reading

- Really focus on your lecture notes for the information on rational numbers.
- Review textbook chapters 1, 2, and 5.
- Text book sections 7.1 and 7.2.

Problems

1). Questions about rational numbers. Be sure to explain why a statement is either true or false. Provide and explain counterexamples for all false statements.

   a). Describe the three forms of a rational number covered in class and give an example of each.

   b). Is zero a rational number?

   c). Is $\frac{\sqrt{9}}{2}$ a rational number?

   d). Is every fraction a rational number?

   e). Based on the class discussion of rational numbers (i.e., the meaning of $\frac{p}{q}$ on the number line), explain why zero can never appear in the denominator.

2). Consider the numbers 120 and 252.

   a). State the prime factorization for each.

   b). Show how to determine and then state their least common multiple (LCM).

   c). Show how to determine and then state their greatest common denominator (GCD).

   d). Show how to simplify $\frac{120}{252}$ using the above information.

3). Rewrite $4 - 9x^2$ by factoring out $(-3x)$.

4). Operations on rational expressions:

a). Fully factor:

$$\frac{2x^2+5x+2}{x^2-3x}$$

b). Fully factor:

$$\frac{2x^3+4x^2}{x^2-9}$$

c). Determine and fully simplify:

$$\frac{2x^2+5x+2}{x^2-3x} \cdot \frac{2x^3+4x^2}{x^2-9}$$

d). Determine and fully simplify:

$$\frac{2x^2+5x+2}{x^2-3x} \div \frac{2x^3+4x^2}{x^2-9}$$