<u>Exam 1 Review</u>

Note: This is not a complete list of topics – you should study your lecture notes and homework in addition to reviewing the items listed here.

1. vocabulary
    a. sum, product, difference, quotient
    b. factor
    c. prime numbers
    d. reciprocal
    e. commutative, associative, distributive, and identity properties
2. important sets
    a. natural numbers $= N = \{1, 2, 3, 4, \ldots\}$
    b. whole number $= W = \{0, 1, 2, 3, 4, \ldots\}$
    c. integers $= Z = \{\ldots -3, -2, -1, 0, 1, 2, 3, \ldots\}$
    d. rational numbers $= Q =$ any number that can be written as a fraction *or*
        $=$ any number whose decimal expansion stops or repeats
    e. irrational numbers $= I =$ any number on the number line that is not rational *or*
        $=$ any number whose decimal expansion does not stop or repeat
    f. real number $= \Re =$ any number that represents a point on the real number line
3. fractions
    a. multiplying: $\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}$
    b. dividing: $\frac{a}{b} \cdot \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$
    c. adding/subtracting: $\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$ $\frac{a}{c} - \frac{b}{c} = \frac{a-b}{c}$
    d. see "fraction review" worksheet online for more practice
4. order of operations
    a. PEMDAS
    b. remember: $(-3)^2 = (-3)(-3) = 9$, but $-3^2 = -3 \cdot 3 = -9$
5. adding integers
    a. same sign – add the absolute values and keep the sign
    b. opposite signs – subtract the smaller from the larger and keep the sign of the larger
6. subtracting integers
    a. $a - b = a + (-b)$
    b. change subtraction to addition by *adding the opposite*
7. multiplying & dividing integers
    a. same sign – answer is positive
    b. opposite sign – answer is negative
    c. $\frac{0}{a} = 0$, but $\frac{a}{0}$ is undefined
8. decimal arithmetic
    a. addition/subtraction – line up the decimal place
    b. multiplication – multiply as usual and move the decimal place the *total* number of digits to the right of the decimal in the original two numbers