Math 115 for Spring 2018

Chapter R: Review of Some Basic Algebra

Sections to be covered: R.2, R.3, and R.4
Important method: Order of Operations on page 24.

Key Review Exercises:
pp. 41–42: 13, 24, 28, 34
p. 42: 2, 4, 5, 6, 11, 12

Suggested Homework Problems:
p. 15: 36, 42
pp. 28–29: 56, 58, 78, 82, 92, 100

Errors in chapter:
page 10 c. at top of page. It should be just $>$.
page 12: Perhaps the interval $(-\infty, \infty)$ should also be listed.

Key Skills

A student (after Chapter R) should be capable of the following:

- recognizing irrational numbers.
- expressing sets using interval notation.
- avoiding the common mistake when a minus sign is in front of a fraction (see page 22, margin)
- careful attention to the definition of the principal square root and the radical sign. (positive only)
- using the order of operations to simplify an expression.

Key Problems are on the next page.

Key Problems

1. Find any two irrational numbers between 3 and 4. Is 17/4 a possible answer?

2. Express in set builder notation, interval notation, and graph: the set of all negative numbers that are greater than -3.7.

3. True or false: $-\frac{\pi}{3}$ is the same as $\frac{-\pi}{-3}$.

4. True or false: the principal square root of 25 is 5, but the expression $\sqrt{25}$ refers to both plus and minus 5.

5. True or false. If false give the correct answer and the correct explanation or correct steps.

   (a) The expression $16 \div 4 \div 2$ equals 8, since 4 divided by 2 is 2 and 16 divided by 2 is 8.

   (b) The expression $(-1)^{-1}$ equals -1, since minus 1 is just -1 and its reciprocal is -1.

   (c) The expression -3^2 is 9, since minus 3 is just -3 and its square is 9.

   (d) The expression $14 - 7 - 2$ is just 5, since 14 less 7 is 7 and then 7 less 2 is 5.

   (e) The expression $.5 + .5^2 = .75$.

   (f) The expressions $3^2 + 2^2$ and $(3 + 2)^2$ have the same value.

   (g) $-(3 - \sqrt{5}) = -(3) - (-\sqrt{5}) = -3 + \sqrt{5} = \sqrt{5} - 3$.

   (h) $-\left[(3)(-\sqrt{5}\right] = (-3)(-(-\sqrt{5}) = -3(\sqrt{5}) = -3\sqrt{5}$.

   Reasonableness check: Was the expression inside the square brackets positive or negative? Was its opposite found? What should that opposite be? Is $-3\sqrt{5}$ positive or negative? What gives?

   (i) The result of the operation '2 to the 3rd power to the 4th power' is 4096, because 2 to the 3rd power is 8 and then 8 to the 4th power is 4096.

   (j) The equation for the operation '2 to the 3rd power to the 4th power' can only be properly written with parentheses, and it is $(2^3)^4$.