Math 127: Review for Test 3

Review Problems: Chapter 7 Test, page 546: 1 – 24 all, 26, 27; Chapter 7 Review, page 545: 47, 61, 69, 71, 75
Chapter 8 Test, page 602: 1 – 10 all, **Also review HW on 8.2, # 19, 21**
For review of section 11.3, see your homework and your notes from Thursday 3/25 and Tuesday 3/30.

1. Rational expressions, equations and applications:

- Given a rational (think "fractional") expression, be able to
  - **Find the Restricted values:** The value(s) of x that make the expression undefined because those values cause division by zero.
  - **Put the expression in lowest terms**: factor first, then divide out common factors
  - **Multiply:** same as above
  - **Divide**: Flip the divisor (always to the right of the division symbol) and multiply
  - **Add, Subtract:** Put all fractions over the LCD, then combine numerators.
  - **Complex Fractions:** Combine component fractions in top and bottom of large fraction then divide (flip the fraction on the bottom and multiply with the top).

- **Given an equation involving fractions, be able to solve**
  - **To solve equations:** Find the LCD and clear all fractions by multiplying the entire equation by the LCD. CHECK YOUR ANSWER FOR DIVISION BY ZERO (Required Check)!!!
  - **Solving formulas for a specified variable:** Clear fractions, as needed. Move all terms with the "target" variable to one side of the equation, move all terms without that variable to the other side, factor out the "target" variable, then divide.

- **Word problems**: Be able to solve problems of the following types
  - Work problems: $\frac{\text{time together}}{\text{time needed alone}} + \frac{\text{time together}}{\text{time needed alone}} = 1 \text{ job}$
  - Motion problems: Set up Distance, Rate and Time table. Look for phrases such as "in the same amount of time" or "the total time for the trip was…" to set up the equation, using the time expressions in the table.
  - Similar triangles and applications of similar triangles (like the building and its shadow problem we did)
  - Variation problems:
    - Translate the variation statement into ONE single formula
    - Solve for k by plugging in the related values of the variables
    - Use k and the formula to solve for the desired variable.

2. Introduction to Functions

- Know the definition of a "relation" and a "function"
- Given a graph or a table of data,
  - determine whether or not it represents a function and be able to EXPLAIN how you know!
  - determine the domain: x-values of the points; sweep through the graph from left to right
  - determine the range: y-values of the points; sweep through the graph from bottom to top
- Given a function in the form of "f(x)", evaluate the function using either a formula, a graph or a table of data.

3. Quadratic Functions and Parabolas

- Memorize the Standard Form of a Quadratic Function: $y = a(x-h)^2 + k$
- Given a quadratic function in Standard Form, be able to
  - Identify the vertex
  - Find the x-intercepts (set y = 0 and solve for x)
  - Find the y-intercept (set x = 0 and find y)
  - Graph the parabola, using all of the information above.
- Given a quadratic function in the form $y = ax^2 + bx + c$, be able to put the equation into Standard Form by completing the square (Note: you'll be allowed to use notes on this part of the exam.)