Review Sheet for Unit Three Exam
Modeling Algebra

The best way to prepare for this exam is to do lots of problems. Your MyLabsPlus site has review problems and a practice exam and you can work as many times as you like. You should work until you can do all problems easily. The practice exam has a few more problems than the real thing but is comparable. Review your workbook pages as well.

Be sure to review the pages we completed in the workbook for this unit.

Here are the main topics in each section of this unit:

Workbook Unit Three: Factoring, Radical Resources, Rational Exponents:
- Simplify a rational expression with radicals
- Simplify expressions with rational exponents
- Simplify a radical expression that contains both variables and constants
- Be able to perform basic computations involving radicals
- Be able to find the greatest common factor and factor it out from polynomial
- Factor polynomial with four terms with factoring by group method
- Factoring polynomial with three terms
- Determine a zero of polynomials with the help of a factoring

Section 3.1 Quadratic Functions; Parabolas: try these pp. 177-180; # 21-30, 31-34, 47, 52, 54, 57, 61, 70
- Determine if the parabola opens up or down.
- Be able to find the vertex of the graph or equation of a quadratic function.
- Determine if the vertex is minimum or maximum.
- Graph a quadratic function.

Section 3.2 Solving Quadratic Equations: try these pp. 193-197; #1-10, 23-26, 31-34, 41-46, 66, 67, 68
- Be able to solve quadratic equations using factoring and the zero product proprty.
- Using quadratic formula for solving quadratic function.
- Knowing definitions of profit, revenue, total cost and break even.

Section 3.4 Quadratic and Power Models: try these pp. 222-228; # 14, 23, 33, 35, 38, 42
- Use first and second differences to determine whether a linear or quadratic is a better fit for a set of data
- Be able to find the best fit quadratic function that models data.

1. Solve for x: $-x^2 + 2x - 1 = 0$

2. Graph the function $g(x) = -x^2 + 4x + 1$.
   Label the vertex and two other points.
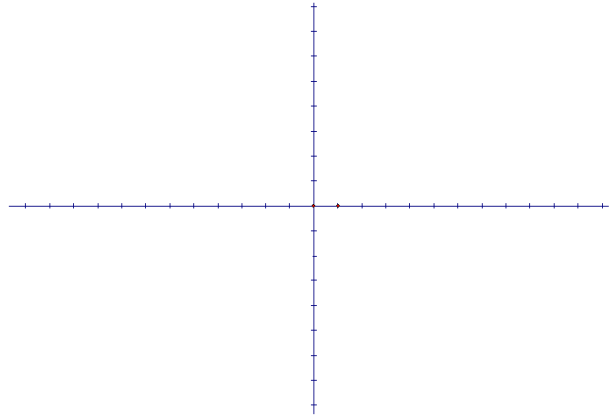
3. If a farmer has 1000 feet of fence and wants to make a rectangular pen with an area given by $A(x) = x(500 - x)$ where x is the width of the pen, what is the largest possible area?

Solve for x:

4. $x^2 - 4x - 8 = 0$

5. $3x^2 + 72 = 33x$

6. $x^2 + x = 2$

7. Suppose a company has cost and revenue functions $C(x) = 5x + 12 + x^2$ and $R(x) = 2x^2 + 7x + 4$. Find where the company will make a profit.

8. Let $f(x) = 2x + 1$ and $g(x) = 2x^2 + 1$. Find where $f(x) > g(x)$.

9. Rewrite without negative exponents.

$$\left(\frac{2m^{-2}n}{3m^{-4}n^2}\right)^{-3}$$

$$\frac{\left(x^2y\right)^{-3}}{x^{-4}y^{10}}$$

10. Evaluate $27^{-\frac{2}{3}}$

11. Rewrite using radicals with no negative exponents.

$$\left(81x^{-8}y^{-4}\right)^{3/4}$$

$$\frac{x^{2/3}y^{5/6}}{x^{-1/3}y^{1/2}}$$