Intro to Quadratics Project

You may choose to present the following parts in a booklet form, poster form, or electronically. The project is due before you leave Friday December 15! The project will count as a quiz grade.

Project must include:

-Title (5 Points)

-2 Quadratic Equations with the axis of symmetry, vertex, and graph labeled. You need one facing up and one facing down. (10 points each)

-2 Word problems with solutions (you may google these since we haven't studied this yet) - (10 points each)

-2 Pictures of parabolas in the real world (10 points each)

-Word Search of key terms (10 points)

-One of the following:

*created crossword puzzle with at least 10 terms from the given list

*write a short story using at least 10 of the terms. (10 points)

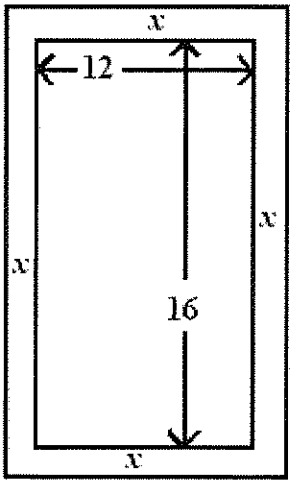
-Neatness and Presentation (5 points)

Total - 90 points

Create your own quadratic word problem. Be creative! Then solve your problem - include an answer key and any illustrations. Below is an example problem.

- A garden measuring 12 meters by 16 meters is to have a pedestrian pathway installed all around it, increasing the total area to 285 square meters. What will be the width of the pathway?

The first thing I need to do is draw a picture. Since I don't know how wide the path will be, I'll label the width as "x".



Looking at my picture, I see that the total width will be $x + 12 + x = 12 + 2x$, and the total length will be $x + 16 + x = 16 + 2x$.

Then the new area is given by:

$$(12 + 2x)(16 + 2x) = 285$$
$$192 + 56x + 4x^2 = 285$$
$$4x^2 + 56x - 93 = 0$$

This quadratic is messy enough that I won't bother with trying to use factoring to solve; I'll just go straight to the Quadratic Formula:

$$x = \frac{-(56) \pm \sqrt{(56)^2 - 4(4)(-93)}}{2(4)}$$
$$= \frac{-56 \pm \sqrt{3136 + 1488}}{8}$$
$$= \frac{-56 \pm 68}{8} = -15.5, 1.5$$

Obviously the negative value won't work in this context, so I'll ignore it. Checking the original exercise to verify what I'm being asked to find, I notice that I need to have units on my answer:

The width of the pathway will be 1.5 meters.

problem from: http://www.purplemath.com/modules/quadprob2.htm

Quadratics Short Story:

You will create a short story using a list of quadratic terms or concepts.

1. Your story must contain at least 10 of the quadratic words or phrases.
2. Each term should be used correctly. Use your math book or dictionary to check definitions and correct use of the term. You may be creative with each term, but in at least one place, use the term correctly or in a manner that clearly demonstrates what it means.
3. Your story may be fiction or nonfiction; witty, silly, sad, or dramatic.
4. Your story should contain a title, an introduction and a conclusion and follow a logical story line.
5. Your story must be at least one page.
6. Be creative, and choose a theme that has relevance to you.
7. Your final copy should be double spaced typed using 12 point font. Bold your terms so I can identify them easily.
8. Share your story with me in google drive.

Use at least 10 of the following quadratic terms or phrases in your story:

- quadratic function
- parabola
- factoring
- infinity
- zeros
- square root
- quadratic formula
- discriminant
- vertex
- x-intercept
- roots
- axis of symmetry
- maximum
- minimum
- trinomial
- curve
- radical
- one real solution
- two real solutions
- no real solutions
- u-shaped
- coefficients
- constant
- tables

- squared exponent
- coordinate plane
- origin

Here's an example:

Lucy & Lucas Line

Lucy Line was a shy girl that loved to spend time alone outdoors. One day while taking a walk in **Coordinate Plane** Park, Lucy Line ran into a boy named Lucas Line. After they **intersected**, they talked for a few minutes then decided to walk together to the ice cream shop located in the middle of park. It was also known as the **origin** circle. Since they were down in the third quadrant of the park, it gave them plenty of time to talk. As they continued walking toward the shop, Lucy Line was amazed at the many things they had in common. They both had a love for **infinity** and it was a relief to hear him say he stayed away from the squiggle crowd. Lucy hated how the squiggles thought they were better than everyone else. They were dangerous – **curving** all over the place. You never knew which way they were turning. Lucy and Lucas both agreed. The squiggles were just trying to be seen. Yep, Lucas Line was special. He was traveling the same straight path that Lucy was taking.

A few years later Lucy Line and Lucas Line got married. After being married for a while, they decided it was time to start a family. Well the strangest thing happened! When the doctor brought the baby girl to Lucas and Lucy Line, she looked like a **parabola**. Lucas said "this isn't my baby, she's not a line!" The baby curved just like a lower case u. Lucy Line was speechless. The baby reminded her of a miniature squiggle…

Project adapted from:
http://hhs.dcsdschools.org/UserFiles/Servers/Server_3842348/File/Math/Slewis/H%20Alg%202/Quadratics%20Project.pdf

Quadratic Crossword

1. Use the quadratic terms below for the answers to your puzzle. Arrange them in the boxes on your paper so that there is only one letter per box. Be sure to place the answers down and across, trying to have a roughly equal number of down and across answers.
2. Write lightly in pencil so that it is easier to erase any mistakes you might make. Keep revising the structure of the puzzle until you find a form you like.
3. Make sure that you spell all words correctly.
4. After you are satisfied with the appearance of your puzzle, write a small number in the first box of each answer. Number the answers consecutively, one set of numbers for the down answers and one set for the across answers.
5. On a separate sheet of paper, write clues for your answers. Be sure that your facts are correct. If necessary, check your math book.
7. Bring two copies of your puzzle. Turn in a blank copy and a key.

Use at least 10 of the following word in your puzzle:

quadratic function
parabola
factoring
zeros
square root
quadratic formula
discriminant
vertex
x-intercept
roots
axis of symmetry
standard form
vertex form
maximum
minimum
trinomial
radical
one real solution
two real solutions
no real solutions
coefficients
constant
tables