

Name: _____ Date: _____ Period: _____

Project: Quadratics

SHOW ALL WORK!

Standards

- **A2.A.REI.D.6** Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the approximate solutions using technology.
- **A2.F.BF.A.1** Write a function that describes a relationship between two quantities.
- **A2.A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- **A2.A.REI.B.3** Solve quadratic equations and inequalities in one variable.
Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .

Objective

- SWBAT create, graph and identify key features of quadratic functions IOT analyze their solutions and solve quadratics in context.

Activities

1. Your teacher will give you a , b & c for your quadratic. Record those values here:

$a =$ _____, $b =$ _____, $c =$ _____.

2. Write a quadratic function using your given values for a , b & c in standard form. Name your function using the first letter of your first name.

3. Determine key characteristics for your graph.

a. Vertex _____

b. Axis of Symmetry _____

c. y-intercept _____

d. Reflection of y-intercept _____

4. Neatly graph your quadratic function on graph paper. Be sure to provide a scale for your graph. Clearly label each axis, the vertex, axis of symmetry (dashed line), x -intercepts, y -intercept and its reflection.

5. Verify your x -intercepts using **two** methods for solving quadratics. State the method used.
 - a. Method 1 _____
 - b. Method 2 _____

6. Using your graph, determine the following.
 - a. x -intercepts _____ and _____
 - b. Domain (interval notation) _____
 - c. Range (interval notation) _____
 - d. Does the vertex indicate there is a maximum or minimum? _____
 - e. State the maximum or minimum value. _____

7. Write your function in completely factored form.

8. Write your function in vertex form.

9. Describe the transformations of your quadratic function from the parent function $y = x^2$.

10. Create a word problem that describes a real-world situation that could be modeled by your quadratic function. Using at least three points from your quadratic and technology, perform a quadratic regression. Is your regression model the same as your quadratic function? Explain.

