

**TI-Nspire Activity:** *Forms of Quadratic Equations*

By: Sandi Dabbs

**Activity Overview**

This activity is designed as a 1 period summary activity on quadratic equations written in vertex form and intercept form (with one problem expressed in standard form to be solved with the quadratic formula). Students should already be familiar with the forms of the equation as well as basic graphing. Keystrokes are listed in the student worksheet and are relatively simple. Questions appear in both the handheld file and on the worksheet for students to answer in either location.

**Concepts**







- Vertex form
- Intercept form
- Standard form (quadratic formula)

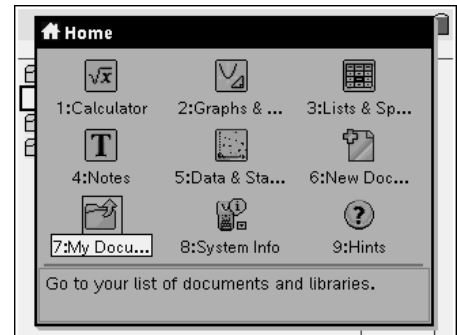
**Teacher Preparation**

Load the *Quadratic Equations.tns* file onto all student handhelds. The activity is designed to be student focused with minimal teacher assistance. Students should record answers on the student handout.

**The Classroom.**

Guide the students in opening *Quadratic Equations.tns* document.

- Turn the device on, .
- Press the Home Key .
- Select 7:My Documents.
- Open the folder containing the TNS file by scrolling to the folder using the NavPad and pressing .
- Scroll to *Quadratic Equations.tns* document and press  to open it.
  - **\*\*If asked do you want to save the other document, press the Tab key  to highlight the No button and press Enter .**






1.1

Title Page

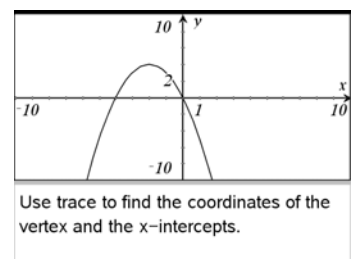


1.2

Use the trace feature    and move along the graph to find the coordinates of the vertex and the x-intercepts.

When you have the vertex, an m should appear on

the screen. When you have an x-intercept, a z should appear on the screen.



Vertex  (-2,4)  x-intercepts  (-4,0) (0,0)

1.3

Draw a perpendicular line through a point on the grid and perpendicular to the x-axis.

(construction) (perpendicular)

Select a point on the grid “point on, click ” and then select the x-axis (). Grab the point ( ) and move the point until it is on the vertex of the parabola.

Equation of the axis of symmetry:

           $x = -2$           

Possible equation of the function:

           $f(x) = -(x + 4)(x - 0)$             
           $f(x) = -x(x + 4)$           

Draw in a line of symmetry. Give the equation of the axis of symmetry and give a possible equation of the function.

Draw in a line of symmetry. Give the equation of the axis of symmetry and give a possible equation of the function.

1.4

Double click on the equation and change one or more numbers to move the graph. Try to move the graph so the vertex falls on each of the different points shown.

What equations resulted in the desired moves?

$f(x) = (x + 4)^2 + 2$        $f(x) = (x + 4)^2 - 2$   
 $f(x) = (x + 4)^2 - 3$        $f(x) = (x + 1)^2 + 5$   
 $f(x) = (x - 2)^2 + 6$

Change the equation until the vertex passes through each of the points shown.

1.5

Mark the answer to the true/false question.  
 (False)

$-x^2 - 4x$   
 $-(x)(x + 4)$   
 $-(x + 2)^2$

The above are all equations of the same graph.

True  
 False

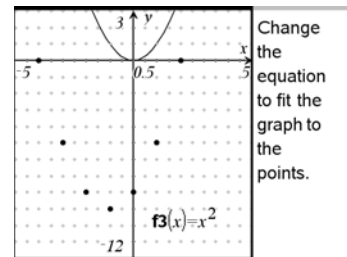
1.6

Double click on the equation and change it so that the graph falls on top of all of the points shown. What equation satisfied the required move?

$$f(x) = (x - 2)(x + 4)$$

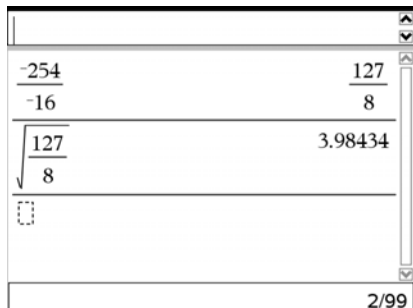
$$f(x) = x^2 + 2x - 8$$

$$f(x) = (x + 1)^2 - 9$$



1.7

Use the calculator page at the bottom of the screen and the equation  $h = -16t^2 + h_0$  to solve for the information.



Wiley Coyote is standing on a cliff 254 feet about Roadrunner. If Wiley Coyote drops a boulder from the cliff, how much time does Roadrunner have to move out of its way?

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## The Document

Below are the pages which appear in the original student document.

Forms of Quadratic Equations

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Use trace to find the coordinates of the vertex and the  $x$ -intercepts.

Draw in a line of symmetry. Give the equation of the axis of symmetry and give a possible equation of the function.

$f(x) = -(x+4)^2 + 4$

Change the equation until the vertex passes through each of the points shown.

$-x^2 - 4x$   
 $-(x)(x+4)$   
 $-(x+2)^2$

The above are all equations of the same graph.

True  
  False

Change the equation to fit the graph to the points.

$f(x) = x^2$

Wiley Coyote is standing on a cliff 254 feet about Roadrunner. If Wiley Coyote drops a boulder from the cliff, how much time does Roadrunner have to move out of its way?

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