Quadratic Equations

5612

Introduction

In this activity, students will explore the standard, factored, and vertex form of a quadratic equation.

Grades 9-12

NCTM Algebra Standards

- Represent and analyze mathematical situations and structures using algebraic symbols
- Understand the meaning of equivalent forms of expressions, equations, inequalities, and relations

Files/Materials Needed

quad.act

1

a. Launch TI-Navigator™ on the computer and start the session.
b. Have each student log into NavNet on their calculator.

2

a. Load the activity settings file ***quad.act***.
b. Click on the **Graph-Equation** tab and enter one of the quadratic equations below in standard form into the Y= window. Click the Add button to graph the quadratic equation.

$x^2 - 2x - 3 = 0$
$x^2 + 4x + 3 = 0$
$x^2 - 8x + 15 = 0$
$x^2 - 4x - 5 = 0$
$x^2 + 6x + 8 = 0$

c. Go to **View** and select **Mask Teacher Input** to hide the equation. A green parabola should appear on the screen
d. Start the activity. Students will see three empty equations on their calculator screens.
e. Instruct students to submit either the standard, factored, or vertex form of the shown equation in Y1.
f. Once they are correct, have them enter the other forms of the quadratic.
g. If there are submissions that have common errors, you may pause the activity, and discuss "what a student who submitted these equations might have been thinking."

3

a. Have students log out of NavNet and use their calculators to enter the three forms of the quadratic into Y1, Y2, and Y3 and use the graph function to check for correct equations.
b. Use **Screen Capture** to check students' understanding.

4

a. Have students log back into NavNet.
b. Use **Quick Poll** (with *Open Response*). For each equation in step 2b have students identify the vertex, *x*-intercept(s), and *y*-intercept(s).

EXTENSION

5

Have students bring in and download pictures from either their digital camera or camera phone that have parabolas (such as a fountain or building arch). Load the photos, one at a time, into Activity Center and have the class submit equations that best model the parabola. You can have contests to see which equation matches the parabola best, or which student can match it best on their first try!