

Name: _____

Date: _____

Vertex to General Form Investigation

Step 1: Label the rectangle diagram for each expression. Label each inner rectangle and find the total sum. Combine any like terms you see and express your answer as a trinomial.

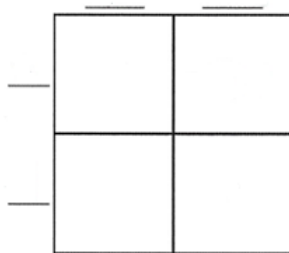
a. $(x + 5)^2$



b. $(x - 3)^2$



c. $(x + 11)^2$



d. $(x - 13)^2$



Step 2: Now, use your knowledge of multiplying binomials to write the quadratic equation below in vertex form to its equivalent general form.

$y = 2(x - 7)^2 - 8$



Step 3: Convert each equation from vertex to general form. Check your answers by entering both equations into Desmos and then graphing.

NOTE: You will need to create and label your own rectangle diagram.

a. $y = (x + 5)^2 + 4$

b. $y = -3(x + 4)^2 + 1$

Step 4: What important features of the graph can you easily determine when the function is written in the form $y = a(x - h)^2 + k$? In the form $y = ax^2 + bx + c$?

Form $y = a(x - h)^2 + k$

Form $y = ax^2 + bx + c$

Step 5: The function $h(t) = -4.9(t - 0.4)^2 + 2.5$ describes the height of a softball thrown by a pitcher, where $h(t)$ is in meters and t is in seconds.

a. How high does the ball go?

b. What is an equivalent function in general form?

c. At what height does the pitcher release the ball when t was 0 seconds?