ACTIVITY 9.3

Developing Concepts

Group Activity for use with Lesson 9.3

Investigating Graphs of Quadratic Functions

GROUP ACTIVITY
Work in a small group.

MATERIALS
graphing calculator

STUDENT HELP
INTERNET **KEYSTROKE HELP**
See keystrokes for several models of calculators at www.mcdougallittell.com

QUESTION How do the coefficients *a*, *b*, and *c* affect the shape of the graph of the quadratic function $y = ax^2 + bx + c$?

EXPLORING THE CONCEPT

1. Use a graphing calculator to graph $y = ax^2$ using -2, -1, -0.5, 0.5, 1, and 2 as values of a. Adjust the viewing window if necessary. Discuss your results with others in your group.

   Write a sentence that describes how the value of a affects the graph of $y = ax^2$.

2. Use a graphing calculator to graph $y = x^2 + bx$ using -4, -2, -1, 0, 1, 2, and 4 as values of b. Adjust the viewing window if necessary. Discuss your results with others in your group.

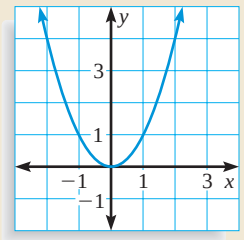
   Write a sentence that describes how the value of b affects the graph of $y = x^2 + bx$.

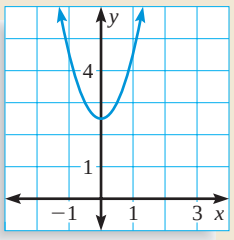
3. Use a graphing calculator to graph $y = x^2 + c$ using -5, -3, -1, 1, 3, and 5 as values of c. Adjust the viewing window if necessary. Discuss your results with others in your group.

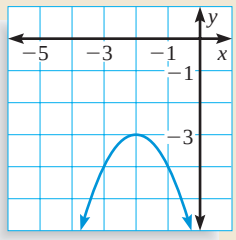
   Write a sentence that describes how the value of c affects the graph of $y = x^2 + c$.

DRAWING CONCLUSIONS

ANALYZING GRAPHS From the graph, what can you tell about the *a*, *b*, and *c* values of the function?

1. 

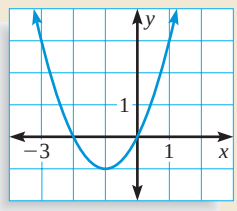
2. 

3. 

SKETCHING GRAPHS Sketch the graph of the function. Use the *a*, *b*, and *c* values.

4. $y = 5x^2$
5. $y = 5x^2 + 10x$
6. $y = 5x^2 + 10x - 5$
7. $y = -2x^2$
8. $y = -2x^2 - 7x$
9. $y = -2x^2 - 7x + 6$

10. **GRAPHING FUNCTIONS** Which of the quadratic functions could be shown by the graph at the right? Explain your reasoning.



   A. $y = x^2 - 2$
   B. $y = x^2 + 2$
   C. $y = 2x^2$
   D. $y = x^2 + 2x$