8.1 Graphing $y = ax^2$

Essential Question What are the characteristics of the graph of the quadratic function $y = ax^2$? How does the value of a affect the graph of $y = ax^2$?

1 ACTIVITY: Graphing a Quadratic Function

Work with a partner.

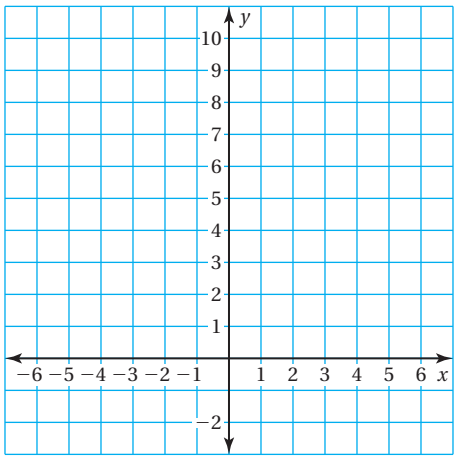
- Complete the input-output table.
- Plot the points in the table.
- Sketch the graph by connecting the points with a smooth curve.
- What do you notice about the graphs?

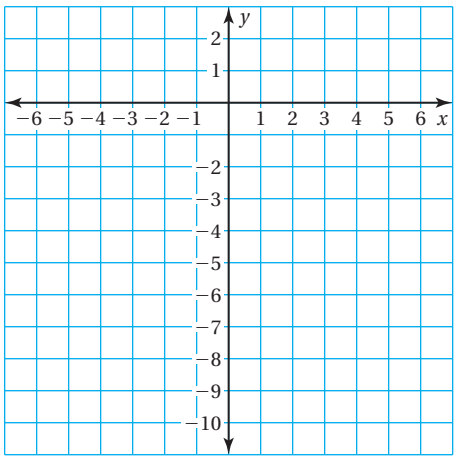
a.

x	$y = x^2$
−3	
−2	
−1	
0	
1	
2	
3	

b.

x	$y = -x^2$
−3	
−2	
−1	
0	
1	
2	
3	





Common Core

Graphing Quadratic Functions

In this lesson, you will
- identify characteristics of quadratic functions.
- graph quadratic functions.

Learning Standard
F.BF.3

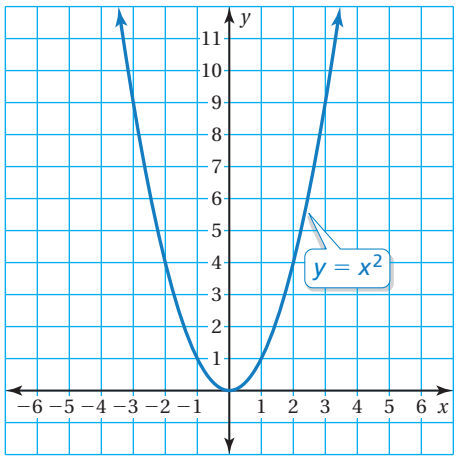
2 ACTIVITY: Graphing a Quadratic Function

Math Practice 7

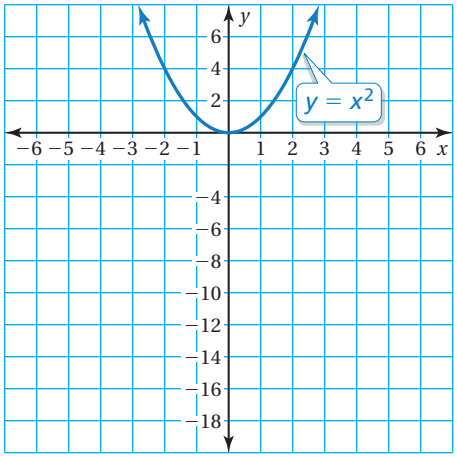
Look for Patterns
What pattern do you notice when comparing each equation with its graph?

Work with a partner. Graph each function. How does the value of a affect the graph of $y = ax^2$?

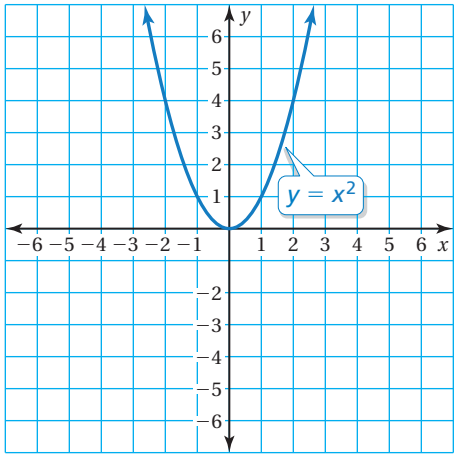
a. $y = 3x^2$



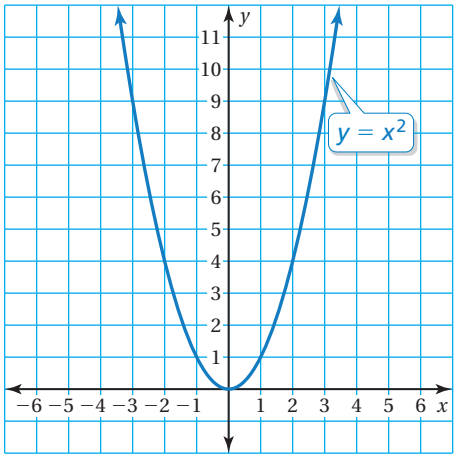
b. $y = -5x^2$



c. $y = -0.2x^2$

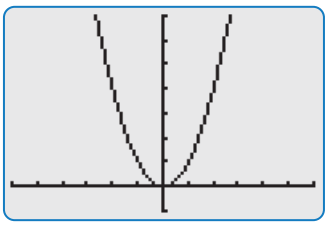


d. $y = \frac{1}{10}x^2$



What Is Your Answer?

3. IN YOUR OWN WORDS What are the characteristics of the graph of the quadratic function $y = ax^2$? How does the value of a affect the graph of $y = ax^2$? Consider $a < 0$, $|a| > 1$, and $0 < |a| < 1$ in your answer.



Practice Use what you learned about the graphs of quadratic functions to complete Exercises 5–7 on page 407.