9 CHAPTER SUMMARY

Animated Algebra
my.hrw.com
Electronic Function Library

BIG IDEAS

For Your Notebook

Big Idea 1

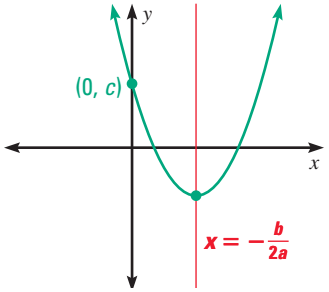
Graphing Quadratic Functions

You can use the properties below to graph any quadratic function.

The graph of $y = ax^2 + bx + c$ is a parabola that:

- opens up if $a > 0$ and opens down if $a < 0$.
- is narrower than the graph of $y = x^2$ if $|a| > 1$ and wider if $|a| < 1$.
- has an axis of symmetry of $x = -\frac{b}{2a}$.
- has a vertex with an x-coordinate of $-\frac{b}{2a}$.
- has a y-intercept of c. So, the point $(0, c)$ is on the parabola.

$y = ax^2 + bx + c$, $a > 0$



Big Idea 2

Solving Quadratic Equations

You can use the following methods to solve a quadratic equation. Sometimes it is easier to use one method instead of another.

Method	When to use
Graphing	Use when approximate solutions are adequate.
Finding square roots	Use when solving an equation that can be written in the form $x^2 = d$.
Completing the square	Can be used for *any* quadratic equation $y = ax^2 + bx + c$ but is simplest to apply when $a = 1$ and b is an even number.
Quadratic formula	Can be used for *any* quadratic equation

Big Idea 3

Comparing Linear, Exponential, and Quadratic Models

You can use linear, exponential, and quadratic functions to model data.

Function	Example	x- and y-values
Linear	$y = 5x + 1$	If the increments between successive x-values are equal, the differences of successive y-values are all equal.
Exponential	$y = 3(2)^x$	If the increments between successive x-values are equal, the ratios of successive y-values are all equal.
Quadratic	$y = x^2 - 4x + 6$	If the increments between successive x-values are equal, the differences of successive first differences of y-values are all equal.