

**Reteaching with Practice**

For use with pages 533–538

**GOAL**

Use the quadratic formula to solve a quadratic equation and use quadratic models for real-life situations

**VOCABULARY**The solutions of the quadratic equation  $ax^2 + bx + c = 0$  are given by the quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \text{ when } a \neq 0 \text{ and } b^2 - 4ac \geq 0.$$

You can read this formula as “ $x$  equals the opposite of  $b$ , plus or minus the square root of  $b$  squared minus  $4ac$ , all divided by  $2a$ .”**EXAMPLE 1****Using the Quadratic Formula**Solve  $x^2 + 3x = 4$ .**SOLUTION**You must rewrite the equation in standard form  $ax^2 + bx + c = 0$  before using the quadratic formula.

$$\begin{aligned} x^2 + 3x &= 4 \\ x^2 + 3x - 4 &= 0 \\ 1x^2 + 3x + (-4) &= 0 \\ x &= \frac{-3 \pm \sqrt{3^2 - 4(1)(-4)}}{2(1)} \\ x &= \frac{-3 \pm \sqrt{9 + 16}}{2} \\ x &= \frac{-3 \pm \sqrt{25}}{2} \\ x &= \frac{-3 \pm 5}{2} \end{aligned}$$

Write original equation.

Rewrite equation in standard form.

Identify  $a = 1$ ,  $b = 3$ , and  $c = -4$ .Substitute values into the quadratic formula:  $a = 1$ ,  $b = 3$ , and  $c = -4$ .

Simplify.

Simplify.

Solutions.

The equation has two solutions:

$$x = \frac{-3 + 5}{2} = 1 \text{ and } x = \frac{-3 - 5}{2} = -4$$

Find the value of  $b^2 - 4ac$  for the equation.

1.  $3x^2 - 8x - 1 = 0$

2.  $2x^2 + 5x - 2 = 0$

3.  $15x^2 - 10x + 1 = 0$

4.  $4x^2 + x - 2 = 0$

5.  $x^2 - 6x + 4 = 0$

6.  $5x^2 - 12x + \frac{1}{2} = 0$

Use the quadratic formula to solve the equation.

7.  $4x^2 - 13x + 3 = 0$

8.  $2x^2 + 7x + 3 = 0$

9.  $-x^2 + x + 30 = 0$

10.  $3x^2 + 7x - 20 = 0$

11.  $-4x^2 + x + 14 = 0$

12.  $2x^2 - x - 2 = 0$

13.  $-2x^2 + 3x - 1 = 0$

14.  $2x^2 + 10x - 5 = 0$

15.  $-6x^2 + 4x - \frac{1}{3} = 0$