

Reteaching 10-6

Using the Quadratic Formula

OBJECTIVE: Using the quadratic formula to solve quadratic equations

MATERIALS: Calculator

- The quadratic formula can be used to solve any quadratic equation.
- When the quadratic equation is in standard form ($ax^2 + bx + c = 0$), where $a \neq 0$, the solutions are found by the quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Example

Solve $x^2 + 5x = 14$.

$$x^2 + 5x = 14$$

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

$$\begin{matrix} a & b & c \\ x^2 + 5x - 14 = 0 \end{matrix}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-5 \pm \sqrt{5^2 - 4(1)(-14)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{25 + 56}}{2}$$

$$x = \frac{-5 \pm \sqrt{81}}{2}$$

$$x = \frac{-5 \pm 9}{2}$$

$$x = \frac{-5 + 9}{2} \quad \text{or} \quad x = \frac{-5 - 9}{2}$$

$$x = 2 \quad \text{or} \quad x = -7$$

← Rewrite in standard form.

← Write a, b, c above the appropriate numbers.
($a = 1, b = 5, c = -14$)

← Use the quadratic formula.

← Substitute 1 for a , 5 for b , and -14 for c .

← Solve.

← Simplify.

← Write two equations.

← Solve for x .

The solutions are $x = 2$ or $x = -7$.

Exercises

Use the quadratic formula to solve each equation. If necessary, round to the nearest hundredth.

1. $3x^2 + 7x + 2 = 0$

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

3. $4y^2 = 3 - 5y$

4. $2 = 11z - 5z^2$

5. $x^2 + 5x = 6$

6. $-3x^2 + x + 5 = 0$

7. $x^2 = 3x + 4$

8. $-4x^2 + x + 7 = 0$