Name _____ Class _____ Date _____

Reteaching 9-7

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 $x^2 + 5x = 14$.

$x^2 + 5x = 14$

$x^2 + 5x - 14 = 0$ ← **Rewrite in standard form.**

$\overset{a}{x^2} + \overset{b}{5x} - \overset{c}{14} = 0$ ← **Write *a, b, c* above the appropriate numbers. ($a = 1, b = 5, c = -14$)**

$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ ← **Use the quadratic formula.**

$x = \dfrac{-5 \pm \sqrt{5^2 - 4(1)(-14)}}{2(1)}$ ← **Substitute 1 for *a*, 5 for *b*, and −14 for *c*.**

$x = \dfrac{-5 \pm \sqrt{25 + 56}}{2}$ ← **Solve.**

$x = \dfrac{-5 \pm \sqrt{81}}{2}$ ← **Simplify.**

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

$x = \dfrac{-5 + 9}{2}$ or $x = \dfrac{-5 - 9}{2}$ ← **Write two equations.**

$x = 2$ or $x = -7$ ← **Solve for *x*.**

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

Exercises

Use the quadratic formula to solve each equation.

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

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

3. $4y^2 = 3 + 4y$

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

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

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

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

8. $-4x^2 - 2x + 12 = 0$

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