NAME _____ DATE _____ PERIOD ____

10-4 Study Guide and Intervention

All Work on Looseleaf.

Solving Quadratic Equations by Using the Quadratic Formula

Quadratic Formula To solve the standard form of the quadratic equation, $ax^2 + bx + c = 0$, use the **Quadratic Formula**.

Quadratic Formula	the formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ that gives the solutions of $ax^2 + bx + c = 0$, where $a \neq 0$

Example 1

$x^2 - 6x = 2$
$-2 \quad -2$
$x^2 - 6x - 2 = 0$

$a = 1$, $b = -6$, $c = -2$

$b^2 - 4ac$
$(-6)^2 - 4(1)(-2)$
$36 + 8 = 44 = d$

QF $x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(-6) \pm \sqrt{44}}{2(1)}$

$= \frac{6 \pm 6.63}{2}$

⊕ $\frac{6+6.63}{2} = \frac{12.63}{2} = 6.315$

⊖ $\frac{6-6.63}{2} = \frac{-0.63}{2} = -0.315$

$x = \{-0.3, 6.3\}$

- MUST PUT IN $ax^2 + bx + c = 0$ form.
- ← Ready to solve. $d = b^2 - 4ac$
- FIND THE VALUE OF THE discriminant.
- Use parentheses, watch signs.
- Positive ⇒ two solutions
  Not a perfect square ⇒ two irrational numbers.

Note:

$d < 0$	$d = 0$	$d > 0$
STOP, NO SOLUTION	ONE SOLUTION	two SOLUTIONS

- $\sqrt{44} = 6.63$, MUST USE A CALCULATOR
- TO NEAREST TENTH ↘ 0.123 (tenth, hundredth, thousandth)

Exercises

Solve each equation by using the Quadratic Formula. Round to the nearest tenth if necessary.

1. $x^2 - 3x + 2 = 0$
2. $m^2 - 8m = -16$
3. $16r^2 - 8r = -1$
4. $x^2 + 5x = 6$
5. $3x^2 + 2x = 8$
6. $8x^2 - 8x - 5 = 0$
7. $-4c^2 + 19c = 21$
8. $2p^2 + 6p = 5$
9. $48x^2 + 22x - 15 = 0$
10. $8x^2 - 4x = 24$
11. $2p^2 + 5p = 8$
12. $8y^2 + 9y - 4 = 0$
13. $2x^2 + 9x + 4 = 0$
14. $8y^2 + 17y + 2 = 0$
15. $3z^2 + 5z - 2 = 0$
16. $-2x^2 + 8x + 4 = 0$
17. $a^2 + 3a = 2$
18. $2y^2 - 6y + 4 = 0$