Name _____ Date _____ Class _____

LESSON 16-3

Reading Strategies

Graphic Organizer

The Quadratic Formula can be used to solve any quadratic equation.

Definition	**Facts**
When the equation is in the form $ax^2 + bx + c = 0$ The quadratic formula is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	In a quadratic equation, the expression under the square root sign, $b^2 - 4ac$, is known as the **discriminant**. It tells you about the roots of the equation. $b^2 - 4ac > 0$: two real roots $b^2 - 4ac < 0$: two complex roots $b^2 - 4ac = 0$: one real root
Example $x^2 - x - 6 = 0$ $a = 1, b = -1, c = -6$ $x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(-6)}}{2(1)}$ $x = 3, x = -2$	**Find the number of roots.** $b^2 - 4ac$ $(-1)^2 - 4(1)(-6)$ $1 + 24 = 25$ $25 > 0$ There are two real roots.

Use the equation $2x^2 - 6x - 9 = 0$ to answer the following questions.

1. Write the values of a, b, and c.

_____

2. Find the value of the discriminant.

_____

3. Does this quadratic equation have real or complex roots?

_____

4. Does the graph of the related quadratic function $f(x) = 2x^2 - 6x - 9$ intersect the x-axis? Explain how you know.

_____

5. What are the solutions to this equation?

_____

Problem Solving

1. a. $t = -0.25, 1.5$
   b. 30 ft
2. a. $t = -0.23, 1.61$; 35.4 ft
   b. $t = -0.21, 1.77$; 44.3 ft
   c. $t = -0.19, 1.94$; 54.3 ft
3. C
4. C

Reading Strategies

1. $a = 2, b = -6, c = -9$
2. $(-6)^2 - 4(2)(-9) = 108$
3. Since the discriminant is positive, the equation has two real roots.
4. Yes; since the equation has two real roots, the related function has two zeros.
5. $x = \frac{-(-6) \pm \sqrt{108}}{2(2)} = \frac{3 \pm 3\sqrt{3}}{2}$

16-4 NONLINEAR SYSTEMS

Practice A

1. (2, 2), (3, 7)
2. (1, 3), (2, 2)
3. (–3, 6), (2, 1)
4. no solution
5. (–1, –2), (2, 7)
6. (–5, 0), (6, 11)
7. (–1, 0), (3, 8)
8. (–2, –1), (–1, 0)
9. (–2, –1), (–3, 5)
10. (–1, –7), (2, –1)

Practice B

1. (–2, 4), (2, 0)
2. (–3, 0), (1, –4)
3. (2, –2), (1, 3)
4. no solution
5. (–2, 7), (1, 4)
6. (–4, 0), (5, 9)
7. (–2.5, 5.25), (2, 3)
8. (–2, 0), (–3, 2)
9. (–1, –2), (–1.5, –1)
10. (0, –4), (5, –19)

Practice C

1. (1, –1), (2, 3)
2. (–1, 11), (4, 6)
3. (2, –2), (1, 3)
4. no solution
5. (2, 3), (–2.5, 5.25)
6. (–3, 2), (–2, 0)
7. (1.5, 6), (0, 3)
8. (2, 9), (0.5, –3)
9. a. ≈ 3.93 s
   b. ≈ 20.41 m

Reteach

1. (0, –4), (1, 0)
2. (–1, 0), (1, 4)
3. (2, 2), (0, 4)
4. (–1, –4), (0, 2)

Challenge

1. (–1, 0), (3, 0)
2. (–1, 0), (3, 0)
3. (–2, 0)
4. no solution
5. (1, –2), (–4, –2)
6. (0, 0)
7. 0; 1; 2

Problem Solving

1. 1.875 s
2. 8.14 s
3. 25
4. 2016
5. A
6. F

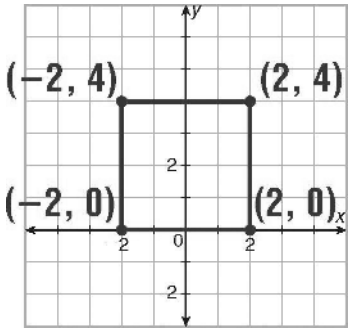
Reading Strategies

1. axis; symmetry; slope; *y*-intercept
2. (–1, –4), (3, 0)

Answers for Unit 6

17-1 INTRODUCTION TO COORDINATE PROOF

Practice A

1. 

2. Possible answer: