Name _____ Date _____ Class _____

Practice B
Solving Quadratic Equations by Graphing and Factoring

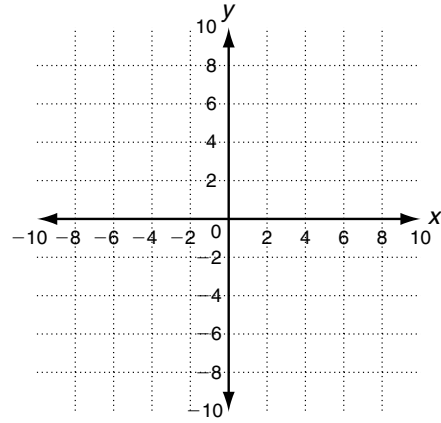**Find the zeros of each function by using a graph and a table.**

1. $f(x) = x^2 + 5x + 6$

x	−4	−3	−2	−1	0
f(x)					

_____

2. $g(x) = -x^2 + 4x + 5$

x	−2	0	2	4	6
f(x)					

_____

Find the zeros of each function by factoring.

3. $h(x) = -x^2 - 6x - 9$ **4.** $f(x) = 2x^2 + 9x + 4$ **5.** $g(x) = x^2 + x - 20$

_____   _____   _____

Find the roots of each equation by factoring.

6. $12x = 9x^2 + 4$ **7.** $16x^2 = 9$

_____   _____

Write a quadratic function in standard form for each given set of zeros.

8. −2 and 7   **9.** 1 and −8

_____   _____

Solve.

10. The quadratic function that approximates the height of a javelin throw is $h(t) = -0.08t^2 + 4.48$, where *t* is the time in seconds after it is thrown and *h* is the javelin's height in feet. How long will it take for the javelin to hit the ground?

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Holt Algebra 2

Practice A
Solving Quadratic Equations by Graphing and Factoring

Tell whether each statement is true or false.

1. Quadratic functions have only one zero.   **False**

2. A zero of a function is the value of x that makes $f(x) = 0$.   **True**

3. The points $(0, 2)$ and $(0, 5)$ could be the zeros of a given quadratic function.   **False**

Find the zeros of $f(x) = x^2 - x - 6$ by using a table and a graph.

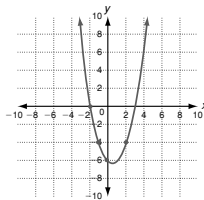4. In what direction does the parabola open?

Upward

x	-2	-1	0	2	4
$f(x)$	0	-4	-6	-4	6

5. Find the y-intercept.

-6

6. Find the vertex.

$(0.5, -6.25)$

7. Plot the vertex and the y-intercept. Complete the table and use the values to draw the graph.

8. What are the zeros of the function?

-2 and 3

Find the zeros of each function by factoring.

9. $f(x) = x^2 - 3x - 10$

a. Set the function equal to 0. $x^2 - 3x - 10 = \underline{0}$

b. Factor. $(x + \underline{2})(x - \underline{5}) = \underline{0}$

c. Set each factor equal to 0. $(x + \underline{2}) = \underline{0}$ or $(x - \underline{5}) = \underline{0}$

d. Solve each equation for x. $x = \underline{-2}$ or $x = \underline{5}$

10. $f(x) = x^2 - 1$ **$1, -1$**

Solve.

11. A quadratic function has zeros equal to 1 and 2.

a. What is the factored form of the function?   **$(x - 1)(x - 2)$**

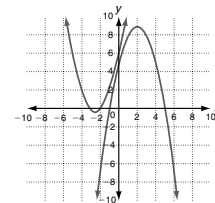b. Multiply the factors to give the quadratic function.   **$x^2 - 3x + 2$**

Holt Algebra 2

Practice B
Solving Quadratic Equations by Graphing and Factoring

Find the zeros of each function by using a graph and a table.

1. $f(x) = x^2 + 5x + 6$

x	-4	-3	-2	-1	0
$f(x)$	2	0	0	2	6

-2 and -3

2. $g(x) = -x^2 + 4x + 5$

x	-2	0	2	4	6
$f(x)$	-7	5	9	5	-7

-1 and 5

Find the zeros of each function by factoring.

3. $h(x) = -x^2 - 6x - 9$ **-3**

4. $f(x) = 2x^2 + 9x + 4$ **$-0.5, -4$**

5. $g(x) = x^2 + x - 20$ **$-5, 4$**

Find the roots of each equation by factoring.

6. $12x = 9x^2 + 4$ **$\dfrac{2}{3}$**

7. $16x^2 = 9$ **$-0.75, 0.75$**

Write a quadratic function in standard form for each given set of zeros.

8. -2 and 7   **$f(x) = x^2 - 5x - 14$**

9. 1 and -8 **$f(x) = x^2 + 7x - 8$**

Solve.

10. The quadratic function that approximates the height of a javelin throw is $h(t) = -0.08t^2 + 4.48$, where t is the time in seconds after it is thrown and h is the javelin's height in feet. How long will it take for the javelin to hit the ground?
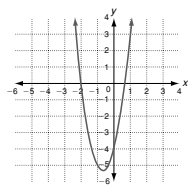
About 7.5 s

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Practice C
Solving Quadratic Equations by Graphing and Factoring

Find the zeros or roots of each function or equation.

1. $f(x) = -x^2 - 11x - 30$ **$-6, -5$**

2. $g(x) = 2x^2 - 25x + 12$ **$0.5, 12$**

3. $36x^2 = 4$ **$-\dfrac{1}{3}, \dfrac{1}{3}$**

4. $56x = 8x^2 + 98$ **3.5**

Solve.

5. Find the zeros of $h(x) = 3x^2 + 4x - 4$ by graphing.

$-2, \dfrac{2}{3}$

6. Write a quadratic function in standard form with zeros 6 and -1.   **$f(x) = x^2 - x - 6$**

7. Write an equation in standard form with roots 3 and -2.   **$f(x) = x^2 - x - 6$**

8. Write a quadratic function with two zeros that have a sum of 3.   **For roots 2 and 1: $f(x) = x^2 - 3x + 2$**

9. Write a quadratic equation with just one nonzero root.   **$f(x) = x^2 - 4x$**

Solve.

10. a. Marilyn hit a golf ball on the ground with her driver. Use the general function for a projectile to write a function that shows the height in feet of her golf ball as a function of time. The ball was hit with an initial vertical velocity of 100 feet per second.

$h(t) = -16t^2 + 100t$

b. How long will Marilyn's golf ball stay in the air?

6.25 s

Holt Algebra 2

Reteach
Solving Quadratic Equations by Graphing and Factoring

Solve the equation $ax^2 + bx + c = 0$ to find the roots of the equation.

Find the roots of $x^2 + 2x - 15 = 0$ to find the zeros of $f(x) = x^2 + 2x - 15$.

$$x^2 + 2x - 15 = 0$$

$$(x + 5)(x - 3) = 0$$ *(Factor, then multiply to check.)*

$$(x + 5) = 0 \text{ or } (x - 3) = 0$$ *(Set each factor equal to 0.)*

$$x = -5 \text{ or } x = 3$$ *(Solve each equation for x.)*

To check the roots, substitute each root into the original equation:

Equation:	$x^2 + 2x - 15 = 0$	$x^2 + 2x - 15 = 0$
Root:	$x = -5$	$x = 3$
Check:	$(-5)^2 + 2(-5) - 15$	$(3)^2 + 2(3) - 15$
	$25 - 10 - 15 = 0 \checkmark$	$9 + 6 - 15 = 0 \checkmark$

The **roots** of $x^2 + 2x - 15 = 0$ are -5 and 3.

The **zeros** of $f(x) = x^2 + 2x - 15$ are -5 and 3.   *(The roots of the equation are the zeros of the function.)*

Find the zeros of each function by factoring. Set the function equal to 0, factor, set each factor equal to 0, and then solve each equation.

1. $f(x) = 4x^2 - 24x$

$4x^2 - 24x = 0$

$4x(x - \underline{6}) = 0$

$\underline{4x} = 0$ or $x - \underline{6} = 0$

$x = 0$ or $x = 6$

2. $f(x) = x^2 + 4x + 3$

$x^2 + 4x + 3 = 0$

$(x + \underline{3})(x + \underline{1}) = 0$

$x + \underline{3} = 0$ or $x + \underline{1} = 0$

$x = -3$ or $x = -1$

3. $f(x) = x^2 - 5x + 4$

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

$(x - 4)(x - 1) = 0$

$x - 4 = 0$ or $x - 1 = 0$

$x = 4$ or $x = 1$

4. $f(x) = 3x^2 + 12x$

$3x^2 + 12x = 0$

$3x(x + 4) = 0$

$3x = 0$ or $x + 4 = 0$

$x = 0$ or $x = -4$

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