Algebra 2 Chapter 5 Calendar - *SOLVING* **Name: _____**

Day	Date	Assignment (Due the next class meeting)
	SEE TEAMS	**Chapter 4 Test** **Notes 5.1 solving by factoring** 5.1 Worksheet *Solve quadratic functions by factoring*
	SEE TEAMS	5.2 Worksheet *Solve many functions by factoring*
	SEE TEAMS	5.3 Worksheet *Solve functions with more complex factoring*
	SEE TEAMS	5.4 Worksheet *Solve quadratic functions by using the quadratic formula*
	SEE TEAMS	5.5 Worksheet *Solve systems involving quadratic functions*
	SEE TEAMS	Ch 5 Practice Test
	SEE TEAMS	**Ch 5 Test** **Notes: 6.1 adding. Subtracting, multiplying polynomials** 6.1 Worksheet *Adding/Subtracting and Multiplying*
Friday October 29th No School – Nevada Day **Thursday November 11th No School – Veteran's Day**		

- Be prepared for daily quizzes.
- Every student is expected to do every assignment for the entire unit.
- Try www.khanacademy.org if you need help outside of school hours.
- Students who complete 100% of their homework for the semester will receive a 2% bonus!

5.1: Solving functions by factoring

Work with your partner or group to determine which are solutions to $f(x) = 0$ and $g(x) = 0$.

$$f(x) = x^2 - x - 6$$

x	***Solution to*** $f(x) = 0$?
-3	
-2	
-1	
0	
1	
2	
3	

$$g(x) = (x - 3)(x + 2)$$

x	***Solution to*** $g(x) = 0$?
-3	
-2	
-1	
0	
1	
2	
3	

Note: The solutions to $f(x) = 0$ and $g(x) = 0$ are also called the "zeroes" or the "roots" of the functions.

How do you find the y-intercept?

How do you find the x-intercept?

Example 1: Find the solutions to the equation: $f(x) = x^2 + 3x$

x	***Solution to*** $f(x) = 0$?
-3	
-2	
-1	
0	
1	
2	
3	

What are the other ways to describe solutions?

Examples -- Find the solutions for the following functions**:**

2.) $y = 3x^2 - 9x$ 3.) $y = 10x^2 - 2x$ 4.) $y = 12x + 4$

What would the graph of these functions look like?

Intercept Form: $f(x) = a(x - root)\,(x - root)$

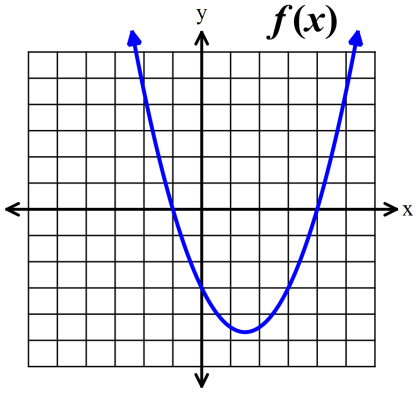
Examples -- Find the solutions (roots, zeroes) for the following functions**:**

5.) $y = 3x^2 - 2x$ 6.) $y = 12x^2 + 9x$

What are the solutions to the following functions?

7.) $y = 2(x + 3)^2 + 8$

Example 8.)
What are the solutions to $f(x) = 0$?



What is a possible equation for $f(x)$ in factored form?

Examples -- Find the solutions for the following functions and sketch graphs by using the x-intercepts (and estimating the vertex).

9) $y = x^2 - 4x + 4$

10.) $y = x^2 + 2x - 15$

Examples—Solve:

11.) $x^2 - 4x = 12$

12.) $-x^2 = x - 42$

5.2: More solving functions by factoring

Work with your partner or group to determine the solutions to $f(x) = 0$ and $g(x) = 0$.

$f(x) = 7x - 14$ $\qquad$ $g(x) = (x-1)(x+1)(x-2)$

x	***Solution to*** $f(x) = 0$?
-2	
-1	
0	
1	
2	

x	***Solution to*** $g(x) = 0$?
-2	
-1	
0	
1	
2	

What would the graph of these functions look like?

$$f(x) = a(x - root)\ (x - root)\ \ldots\ (x - root)$$

Examples -- Find the zeroes for the following functions**:**

1.) $y = (x+3)(x-2)(x+5)$ $\qquad$ 2.) $f(x) = 3x(x + \frac{1}{2})(5x - 2)$

Examples -- Find the solutions for the following functions**:**

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

Degree of a function vs. # of solutions:

Examples -- Find the x-intercepts for the following functions**:**

5.) $y = 3x^2 + 6x + 3$ $\qquad$ 6.) $f(x) = -x^2 + 2x + 35$

Examples -- Find the zeroes for the following functions**:**

7.) $f(x) = -2x^4 + 14x^3 - 24x^2$ $\qquad$ 8) $5x^4 - 15x^2 = 0$

5.3: Solving functions by more complex factoring

Work with your partner or group to simplify and write the function in standard form.

1) $f(x) = (3x + 5)(x + 1)$

2) $g(x) = (5x + 7)(5x - 7)$

Examples -- Find the solutions for $f(x) = 0$ in the following functions**:**

3) $f(x) = 2x^2 + 9x - 5$

4) $f(x) = 6x^2 + 11x + 3$

5) $y = 3x^2 - 7x - 20$

6) $f(x) = -10x^2 + 18x + 4$

Examples -- Find the solutions for the following functions:

7) $y = 4x^2 - 25$

8) $36x^2 - 50 = -1$

9) $f(x) = -16x^5 + 9x^3$

Examples -- Find the solutions for the following functions**:**

10) $y = x^4 - 5x^2 + 4$

11) $2x^4 - 36x^2 + 162 = f(x)$

12) $y = x^4 - 29x^2 + 100$

13) $-x^3 - 25x = 0$

14) $x^4 - 36 = 0$

5.4 Notes: Solving Quadratics using the Quadratic Formula

A quadratic equation in general form: $\boldsymbol{ax^2 + bx + c = 0}$. Let a, b, and c be real numbers such that $a \neq 0$.

The Quadratic Formula: $\boldsymbol{x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}}$

Solve using the Quadratic Formula

1) $x^2 + 7x = -6$

2) $-x^2 + 2x = 5$

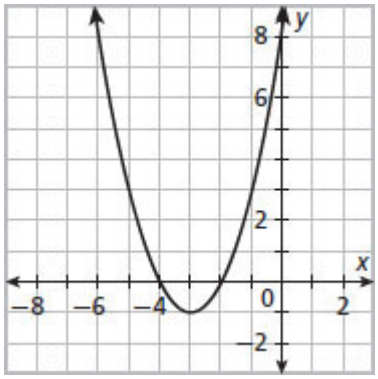
3) $x^2 + 3x = 8 + 4x$

4) $3x^2 - 8 = 0$

Example 5) A rocket is launched off a platform with an initial velocity of 19.6 meters per second. The path of the rocket can be modeled by the equation $h = -4.9t^2 + 19.6t + 58.8$, where h is the height of the rocket, and t is the time in seconds. After how many seconds will the rocket hit the ground?

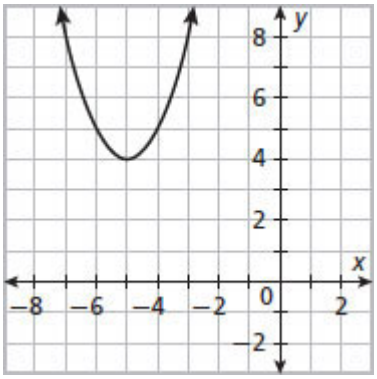
Recall what solutions to functions look like on a graph:

Example 6) What are the solutions to $f(x) = 0$?



Example 7) What are the solutions to $g(x) = 0$?

Hint: What is an equation for $g(x)$ in vertex form?



5.5 Notes: Systems of Linear and Quadratic Equations

Essential Question: How can you solve a system of equations when one equation is linear and the other is quadratic?

Exploration: Find the solutions to the given equation.
Given $f(x) = 3x^2 - 6x + 5$ and $g(x) = -3x + 23$, complete the tables below to find the x-values where $f(x) = g(x)$.

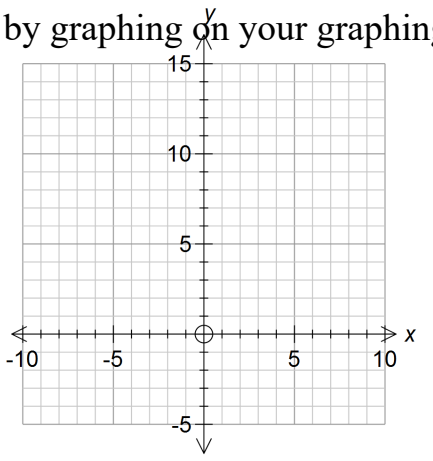
$f(x) = 3x^2 - 6x + 5$	
x	$f(x)$
-3	
-2	
-1	
0	
1	
2	
3	
4	
5	
6	
7	

$g(x) = -3x + 23$	
x	$g(x)$
-3	
-2	
-1	
0	
1	
2	
3	
4	
5	
6	
7	

Graph both equations on the graphing calculator. What do you notice?

Example 1: First solve the system of equations by graphing on your graphing calculator. Then, solve by using algebra.

$$\begin{cases} y = -x^2 + 9 \\ y = x + 3 \end{cases}$$



Example 2: Solve by using algebra.

$$\begin{cases} f(x) = 4x^2 + 5x - 4 \\ g(x) = -3x - 4 \end{cases}$$

3) Solve the system: $\begin{cases} x^2 + 14x + 3y + 1 = 10 \\ 3x + y = -5 \end{cases}$

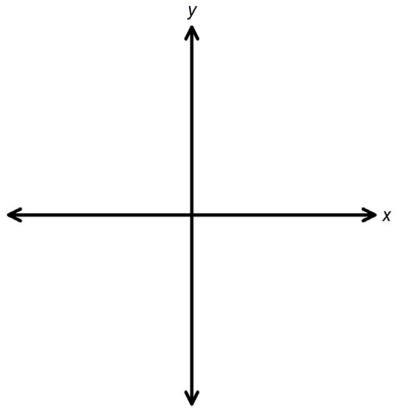
What are the 2 algebraic ways to solve systems of quadratic and linear functions?

How many answers will you get for these types of systems? 3 different situations:

One solution: **Two solutions:** **No solutions:**

Example 4: Use a graphing calculator to solve this system of equations by graphing.

$$\begin{cases} f(x) = 2x + 1 \\ g(x) = -(x-5)^2 - 2 \end{cases}$$



5)

Which of the following systems of equations could a student use to write a quadratic function in standard form for the parabola passing through the points $(1, -3)$, $(4, 6)$, and $(5, 9)$?

A. $\begin{cases} x^2 - 3x + c = y \\ 4x^2 + 6x + c = y \\ 5x^2 + 9x + c = y \end{cases}$

C. $\begin{cases} a - 3b + c = y \\ 16a + 6b + c = y \\ 25a + 9b + c = y \end{cases}$

B. $\begin{cases} 2a + b + c = -3 \\ 8a + 4b + c = 6 \\ 10a + 5b + c = 9 \end{cases}$

D. $\begin{cases} a + b + c = -3 \\ 16a + 4b + c = 6 \\ 25a + 5b + c = 9 \end{cases}$

6)

A parabola has x-intercepts at 2 and 6 and goes through the point $(8, 4)$. What other point is on the parabola?

A. $(-2, -2)$

C. $(-3, 15)$

B. $(4, -2)$

D. $(1, 15)$