Unit 5 – Solving Quadratic Functions

Now that we know how to work with quadratics, we can solve them! What does it mean when we solve a quadratic? What are we looking for?

____

Since we have quadratics we should be looking for _____________solutions!

We can write our solutions as ordered pairs. (#, 0) (#,0) or as ____________________________.

Solving Methods:

- -Factoring/Zero Product Property
- -Square Root Method
- -Quadratic Formula

Today we will talk through helping us find the best strategy depending on the quadratics we are given.

Part 1- Factoring (Zero Product Property) Method: If quadratics are factored, or if we can feel confident in our ability to factor a given problem, this method can be super easy!

All we need to do is _______________________________________ and solve for x!

1. $(x - 2)(x + 4)$
2. $(2x - 3)(x - 5)$
3. $x(3x + 2)$
4. $(x + 12)(x - 6)$
5. $(x - 7)(2x - 5)$
6. $x(x+9)$
7. $(x+5)(x - 15)$
8. $(x - 3)(x - 8)$
9. $(x+6)(x+3)$

In order to solve using the remaining methods we need to recall:

Simplifying Radicals:
When simplifying radicals it is important that we make ______________________________.

We want to look for ____.

Anything left ____.

If multiple numbers are present in either location we must_____________________________.

Remember, negatives under the radical mean that we have _______________________________.

Simplify the following radicals completely.

1. $\sqrt{250}$

2. $\sqrt{48}$

3. $\sqrt{-16}$

4. $\sqrt{216}$

5. $\sqrt{45}$

6. $\sqrt{-98}$

7. $\sqrt{-169}$

8. $\sqrt{200}$

Part 2- Square Root Method: If quadratics are in ________________________________, (or that we find confident putting it in this form) or a quadratic is ____________________________, this is the best method!

1. $(x+3)^2+2= -10$

2. $2(x+2)^2+24$

3. $5x^2-1=9$

4. $(x-4)^2-13=0$

5. $5 - 3x^2 = 20$

6. $x^2 - 49$

7. $x^2 + 100$

8. $2(x + 3)^2 + 12 = 4$

9.$5x^2 + 9 = 134$

10. $2x^2 + 8 = 10$

Part 3- The Quadratic Formula: If quadratics have an a-value that is bigger than one, or we do not know how to approach in solving, the quadratic formula can always work!

State the Quadratic Formula:

To help you remember, you could sing our song… or think about this story! *"There once was a negative **b**oy who was unsure if he wanted to go to a radical party. But the **b**oy was feeling squared and missed out on four **a**wesome **c**hicks! The party was not over until **2 a**m!*

$x = \underline{\hspace{5cm}}$

Solving using the Quadratic Formula:

1. $x^2 + 16x + 68 = 0$

a= ____ b=____ c=____

2. $2x^2 - 7x + 6 = 0$

a= ____ b=____ c=____

3. $x^2 - 8x + 24 = 0$

a= ____ b=____ c=____

4. $2x^2 - 32 = 0$

a= ____ b=____ c=____

5. $6x^2 + 2x + 1 = 0$

a= ____ b=____ c=____

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

a= ____ b=____ c=____

Calculator Strategies:

- We can also try to use our calculator while testing to help us find solutions!
    - Use your table! We want to look for ______________________!
        - Careful: Not all answers can be seen from the table.

          Example: $x^2 - x - 6$

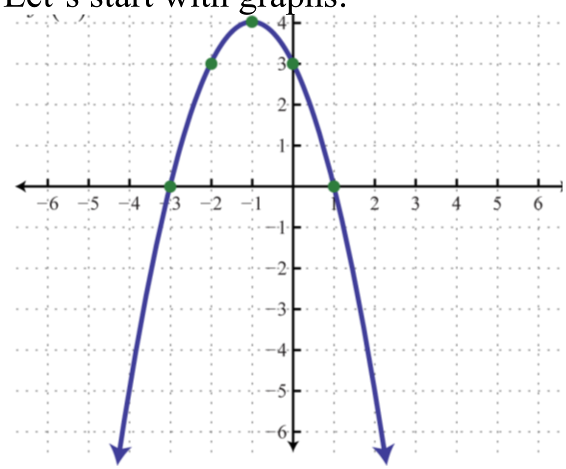
          Solutions: ____
    - Trace Feature: We can trace in our calculators to find where the x-intercepts are. We can then use those values to match- up our answer choices.
        - Steps:
            - 2nd → Trace
            - Zero
            - Left Bound, Right Bound, Enter!

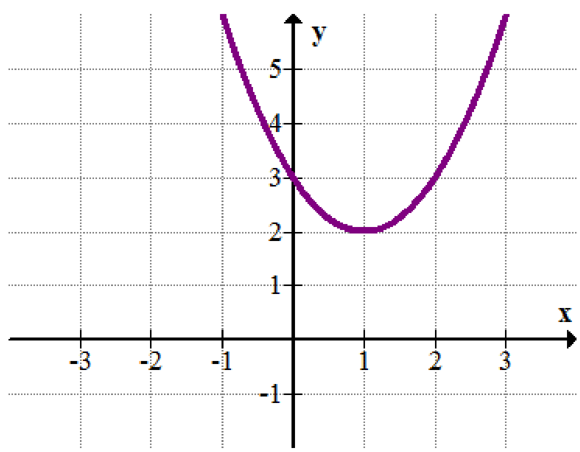
          Example: $3x^2 - 5x - 15$

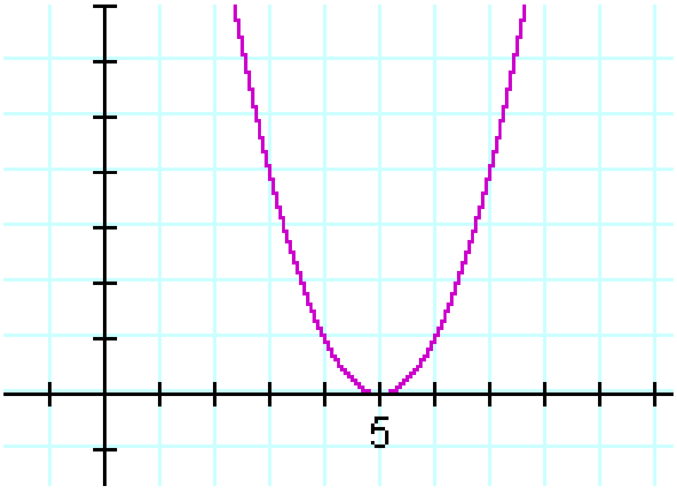
          Solutions: _______________________________________

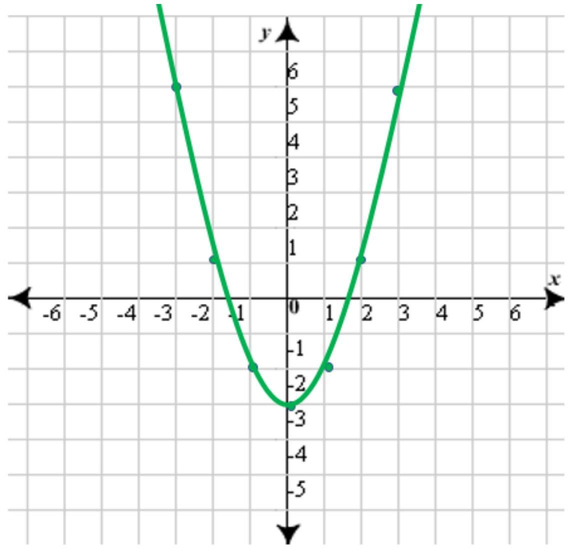
Types of solutions: We can look at our graph as well as the ____________________ of a quadratic to tell us the types of solutions! Let's take a look to see how this works!

Let's start with graphs:









Let's look at Discriminants! (Fancy way of using what we have in the quadratic formula!)

We will use: ___________________________________

	Discriminant	Type of Solution
1. y= $3x^2 - 3x + 2$		
2. y= $x^2 - 10x + 1$		
3. y= $2x^2 - 16x + 24$		
4. y= $x^2 + 4x + 17$		
5. y= $x^2 + 2x - 6$		
6. y= $2x^2 - x - 3$		