**Topic 2.6: The Quadratic Formula**

## Essential Question:

***How can you use Quadratic Formula to solve quadratic equations or to predict the nature of their solutions?***

## Explore & Reason

Please complete online.

## CONCEPT Summary

### Key Features of the Quadratic Formula

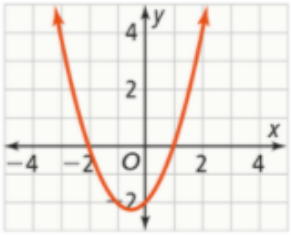
**QUADRATIC FORMULA**

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

This formula is used to solve any quadratic equation: $ax^2 + bx + c = 0$, where $a \neq 0$.

**USING THE DISCRIMINANT**

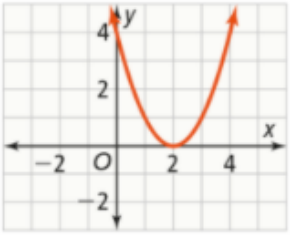
Predict the number and type of solutions using the discriminant, $b^2 - 4ac$.




$x^2 + x - 2 = 0$

$b^2 - 4ac > 0$

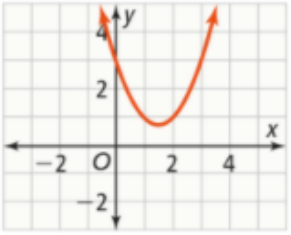
Two real solutions




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

$b^2 - 4ac = 0$

One real solution




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

$b^2 - 4ac < 0$

Two non-real solutions

## Notes:

## Examples & Questions

### Examples 1
Q: Why must *a* be a nonzero number in the quadratic equation?

Q: What distinguishes real resolutions from complex solutions?

### Examples 2
Q: How can you determine whether a quadratic equation is easily factorable?
Q: If you factored by trial and error, what question would you need to start with?

### Examples 3
Q: If each parabola were reflected over the horizontal line that contain its vertex, how many and what type of solutions would each parabola have?
Q: Do you need to solve the equations to determines the number and types of solutions?

### Examples 4
Q: Why does the equation need to be rewritten in standard form?

### Examples 5
Q: Why are there *two* values and *b* that will result in *one* real solution?
Q: Describe what the graphs of $y = 2x^2 + -12x + 18$ look like.

## Practice and Problem Solving
Complete MathXL for School: Practice and Problem Solving (online)
Complete MathXL for School: Enrichment (online)

Challenge: #12, 13, 46, 47, 50 – key will be posted in Power School Learning.

## Lesson Quiz 2.6