

## Wednesday February 7, 2018

### How do I get ready for class?

- 1) On Desk: binder, pens/pencils
- 2) You are tardy if you are not in your seat when the bell rings

### Homework:

Quadratic Formula

### Upcoming.....

Test moved to Tuesday

### Warm Up:

- 1) List all the different ways we have learned to solve a quadratic. *Factoring<sup>ZPP</sup>, Completing the Square, Taking<sup>Square</sup> Roots*
- 2) Solve by completing the square:  $x^2 - 12x = 13$

## Homework Review

### Now Reviewing:

- Completing the Square

## Standards

- **MGSE9–12.A.REI.4a** Use the method of completing the square to transform any quadratic equation in  $x$  into an equation of the form  $(x - p)^2 = q$  that has the same solutions. Derive the quadratic formula from  $ax^2 + bx + c = 0$ .
- **MGSE9–12.A.REI.4b** Solve quadratic equations by inspection (e.g., for  $x^2 = 49$ ), taking square roots, factoring, completing the square, and the quadratic formula, as appropriate to the initial form of the equation (limit to real number solutions).

## The Quadratic Formula

## The Quadratic Formula

So far we have learned several methods for solving quadratic equations.

Factoring <sup>ZPP</sup>, Square Roots  $\sqrt{x^2} = \sqrt{a}$ , Completing the Square  $x^2 + bx + \square = c + \square$

The quadratic formula will work for **ANY** quadratic equation written in standard form :  
 $ax^2 + bx + c = 0$

## The Quadratic Formula

### Steps for successfully applying the Quadratic Formula:

1. Write the equation in standard form.
2. Set the function equal to 0 if necessary.
3. Identify a, b, and c and plug them into the quadratic formula using parentheses.
4. Use the order of operations to simplify.
5. Simplify the radical if you can.

## The Quadratic Formula

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

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

**\*\* Write the formula for EVERY problem!\*\***

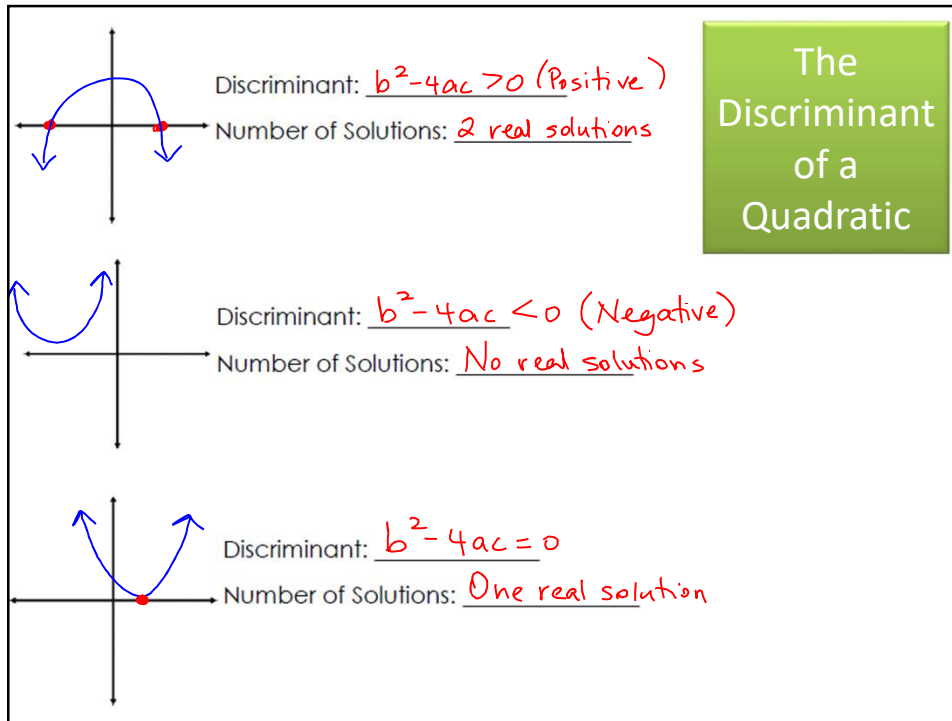
## The Discriminant of a Quadratic

The discriminant tells the number of solutions of a quadratic.

### **THE DISCRIMINANT OF A QUADRATIC**

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

Discriminant



Finding the discriminant for each equation, and then find the solutions using the quadratic formula.

A)  $f(x) = 3x^2 - 5x - 2$

$0 = 3x^2 - 5x - 2$       $a = 3$       $b = -5$       $c = -2$

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

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(-2)}}{2(3)}$$

$$x = \frac{5 \pm \sqrt{25 + 24}}{6}$$

$$x = \frac{5 \pm \sqrt{49}}{6} \text{ discriminant}$$

$$x = \frac{5 + 7}{6}$$

$$x = \frac{5 + 7}{6} = \frac{12}{6} = 2$$

$$x = \frac{5 - 7}{6} = \frac{-2}{6} = -\frac{1}{3}$$

Discriminant: 49 (Positive)

Number of Solutions: 2 real Solutions     Solutions:  $x = \left\{ -\frac{1}{3}, 2 \right\}$

Finding the discriminant for each equation, and then find the solutions using the quadratic formula.

B)  $x^2 + 2 = 2x$

$$x^2 - 2x + 2 = 0 \quad a=1 \quad b=-2 \quad c=2$$

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

$$X = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(2)}}{2(1)}$$

$$= \frac{2 \pm \sqrt{4 - 8}}{2}$$

$$= \frac{2 \pm \sqrt{-4}}{2} \text{ Discriminant}$$

\* You cannot take the square root of a negative!

Discriminant: -4

Number of Solutions: No real Solutions      Solutions: No real solutions

## Classwork/Homework

Quadratic Equations #1 and #2 a, b