Algebra II **Section 5.6**
Auch **Date:**

Objectives

- Solve quadratic equations using the Quadratic Formula
- Classify roots using the discriminant.

Vocabulary

discriminant -

Watch what we make using by completing the square to the equation $ax^2 + bx + c = 0 \quad (a \neq 0)$

The Quadratic Formula

If $ax^2 + bx + c = 0 \quad (a \neq 0)$, then the solutions, or roots, are

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

Example 1

Find the zeros of $f(x) = x^2 + 10x + 2$ by using the Quadratic Formula.

Try it!

a) **Find the zeros of** $f(x) = x^2 + 3x - 7$

b) **Find the zeros of** $f(x) = x^2 - 8x + 10$

Example 2 Quadratic Functions with Complex Zeros

Find the zeros of $f(x) = 2x^2 - x + 2$ by using the Quadratic Formula.

Try it!

a) Find the zeros of $g(x) = 3x^2 - x + 8$ by using the Quadratic Formula.

Discriminant		
The discriminant of the quadratic equation $ax^2 + bx + c = 0 \quad (a \neq 0)$, is $b^2 - 4ac$.		
$b^2 - 4ac > 0$	$b^2 - 4ac = 0$	$b^2 - 4ac < 0$
Two distinct real solutions	One distinct real solution	Two distinct nonreal complex solutions

Example 3 **Analyzing Quadratic Equations by Using the Discriminant**

Find the type and number of solutions for each equation.

a) $x^2 - 6x = -7$

b) $x^2 - 6x = -9$

c) $x^2 - 6x = -11$

Try it! a) $x^2 - 6x = -7$

b) $x^2 - 6x = -9$

c) $x^2 - 6x = -11$