Name _____ Class _____ Date _____

Reteaching 10-7

Using the Discriminant

OBJECTIVE: Using the discriminant to find the number of solutions of a quadratic equation

MATERIALS: Calculator

In the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, the discriminant is the expression under the radical sign, $b^2 - 4ac$. The discriminant determines how many solutions, or x-intercepts, a quadratic equation has.

- If the discriminant is positive, there are two real solutions.
- If the discriminant is 0, there is one real solution.
- If the discriminant is negative, there are no real solutions.

Example

Find the value of the discriminant and the number of real solutions for each quadratic equation.

$ax^2 + bx + c = 0$	Discriminant ($b^2 - 4ac$)	Number of Solutions	Number of x-intercepts
1. $x^2 + 2x + 3 = 0$	$(2)^2 - 4(1)(3) = -8$	none	none
2. $x^2 - 2x + 1 = 0$	$(-2)^2 - 4(1)(1) = 0$	one	one
3. $x^2 - 2x - 2 = 0$	$(-2)^2 - 4(1)(-2) = 12$	two	two

Exercises

Find the value of the discriminant and the number of solutions for each quadratic equation.

$ax^2 + bx + c = 0$	Discriminant ($b^2 - 4ac$)	Number of Solutions	Number of x-intercepts
1. $2x^2 + 3x + 3 = 0$			
2. $x^2 - 2x + 4 = 0$			
3. $3x^2 - 6x + 3 = 0$			

Find the value of the discriminant and the number of solutions of each equation.

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

5. $-\frac{1}{2}x^2 + x + 3 = 0$

6. $5x^2 - 2x + 3 = 0$