

Name: _____

Quadratic Equations

Date: _____

Class: Algebra

Topic: Discriminant

Notes

Discriminant: $b^2 - 4ac$ **How does
Discriminant Work?**

Discriminant is under the _____.

 $\sqrt{+}$ means _____. $\sqrt{0}$ means _____. $\sqrt{-}$ means _____.**Type One****Type Two****Type Three****Value of the
Discriminant**

$$b^2 - 4ac > 0$$

$$b^2 - 4ac = 0$$

$$b^2 - 4ac < 0$$

**Number and Types
of Solutions.****Graphs of**

$$y = ax^2 + bx + c$$

Example:

Model_ Find the discriminant. Determine the types of solutions. If the roots are real, solve each quadratic equation. State rational roots in simplest form, and round irrational roots to the nearest hundredth.

EX #1	EX #2	EX #3
$x^2 - 6x + 9 = 0$	$x^2 - 3x - 10 = 0$	$x^2 - 3x + 10 = 0$
<u>Discriminant:</u>	<u>Discriminant:</u>	<u>Discriminant:</u>
<u>Solution:</u>	<u>Solution:</u>	<u>Solution:</u>

CFU Think-Pair-Share

- a) Find the discriminant and describe the nature of the roots.
b) If the roots are real, solve each quadratic equation. State rational roots in simplest form, and round irrational roots to the nearest hundredth.

$x^2 - 5x - 3 = 0$	$x^2 - 5x + 5 = 0$	$x^2 - 2x - 8 = 0$	$4x^2 - 1 = 0$
a)	a)	a)	a)

Independent Practice

How many real-number solutions does

$$4x^2 + 2x + 5 = 0 \text{ have?}$$

- 1) one
- 2) two
- 3) zero
- 4) infinitely many

Is the solution to the quadratic equation written below rational or irrational? Justify your answer.

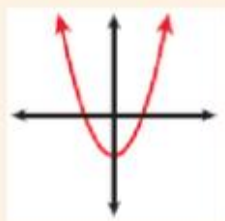
$$0 = 2x^2 + 3x - 10$$

Discriminant

The discriminant of the quadratic equation $ax^2 + bx + c = 0$ ($a \neq 0$) is $b^2 - 4ac$.

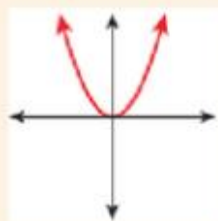
$$b^2 - 4ac > 0$$

two distinct real solutions



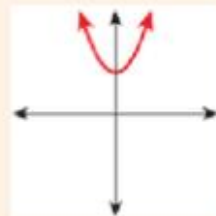
$$b^2 - 4ac = 0$$

one distinct real solution



$$b^2 - 4ac < 0$$

two distinct nonreal complex solutions



Find the type and number of solutions for each equation.

A $x^2 - 6x = -7$

B $x^2 - 6x = -9$

C $x^2 - 6x = -11$

Find the value of the discriminant of each quadratic equation.

1) $6p^2 - 2p - 3 = 0$

2) $-2x^2 - x - 1 = 0$

3) $-4m^2 - 4m + 5 = 0$

4) $5b^2 + b - 2 = 0$

5) $r^2 + 5r + 2 = 0$

6) $2p^2 + 5p - 4 = 0$

Find the discriminant of each quadratic equation then state the number of real and imaginary solutions.

7) $9n^2 - 3n - 8 = -10$

8) $-2x^2 - 8x - 14 = -6$

9) $9m^2 + 6m + 6 = 5$

10) $4a^2 = 8a - 4$