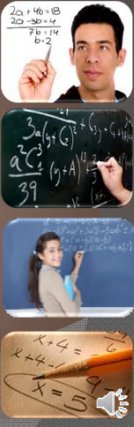
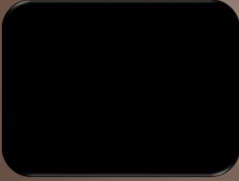
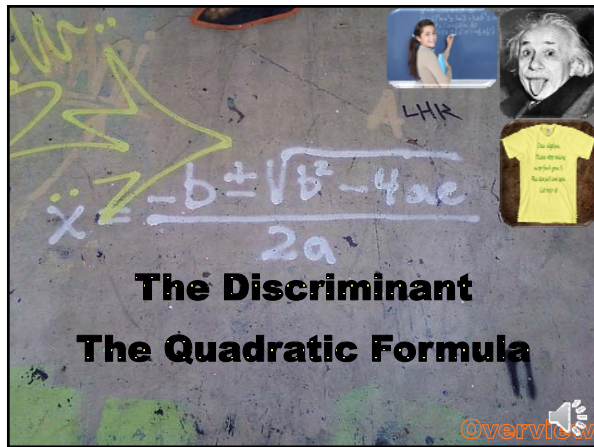


Algebra 1

The Quadratic Formula and The Discriminant



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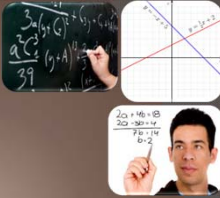
The Discriminant

The Quadratic Formula

Overview

Methods of Solving Quadratic Equations

1. Factoring
2. Graphing
3. Finding Square Roots
4. Completing the Square
5. The Quadratic Formula



The Quadratic Formula and The Discriminant


The Quadratic Formula

$$ax^2 + bx + c = 0$$

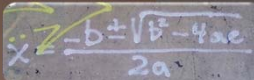
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$x^2 + 3x + 3 = 0$ $x = \frac{-3 \pm \sqrt{3^2 - 4(1)(1)}}{2(1)}$

$$x = \frac{-3 \pm \sqrt{9 - 4}}{2} \quad x = \frac{-3 \pm \sqrt{5}}{2}$$

$$x \approx \frac{-3 \pm 2.24}{2} \approx \frac{-5.24}{2} \text{ and } \frac{-0.76}{2}$$


The Quadratic Formula and The Discriminant

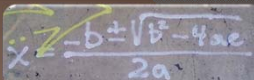


Use the Quadratic Formula to solve this equation. Round your answer to the nearest hundredth if necessary.

$$9 = 7x^2 - 2x$$

You Try It

$$9 = 7x^2 - 2x$$

$$0 = 7x^2 - 2x - 9$$


$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(7)(-9)}}{2(7)}$$


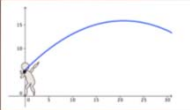
$$x = \frac{18.12}{14} \quad x = 1.29 \quad x = \frac{-14.12}{14} \quad x = -1.01$$

Use the Quadratic Formula to solve this equation. Round your answer to the nearest hundredth if necessary.

$$9 = 7x^2 - 2x$$

You Try It

$0 = -.024x^2 + x + 5.5$


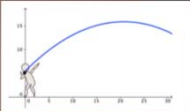



The distance of this shot put throw can be modeled by the equation $y = -.024x^2 + x + 5.5$, where x = distance traveled in feet and y = height in feet. When $y = 0$, the shot put has hit the ground. How far was the throw?

$0 = -.024x^2 + x + 5.5$


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

$$x = \frac{-1 \pm \sqrt{1^2 - 4(-.024)(5.5)}}{2(-.024)}$$

$$x = \frac{-1 \pm 1.24}{-.048} = 46.6', -4.9'$$



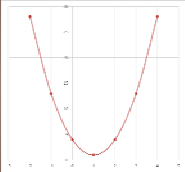
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The Quadratic Formula

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


The Discriminant:

- > 0 , 2 solutions
- $= 0$, 1 solution
- < 0 , no solutions



$3x^2 - 6x + 4 = 0 \quad (-6)^2 - 4(3)(4) = 36 - 48$
no solutions

The Quadratic Formula and The Discriminant

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

Determine how many times the graph of this equation crosses the x axis:

$y = 2x^2 + 3x - 5$

You Try It!

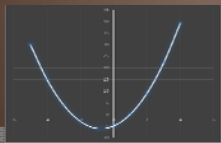
$b^2 - 4ac$

$(3)^2 - 4(2)(-5) = 9 + 40 = 49$

Determine how many times the graph of this equation crosses the x axis:

$y = 2x^2 + 3x - 5$

You Try It!



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