

Lesson 9.6 Warm Up (Clickers)

1. What is the vertex of $y = 2x^2 - 8x + 4$?

2. Solve for x : $-2x^2 - 9 = -9$

3. Solve for x : $x^2 - 9x - 36 = 0$

Lesson 9.6 The Quadratic Formula & Discriminant

Essential Understanding: You can find the solution(s) of any quadratic equation using the quadratic formula.

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

Ex. Solve for x : $2x^2 + 3x - 5 = 0$

Ex. Solve for x : $x^2 - 8 = 2x$

Ex. Solve for x : $x^2 - 4x = 21$

Ex. Solve for x : $-2x^2 + 5x - 7 = 0$

Ex. In the shot put, an athlete throws a heavy metal ball through the air. The arc of the ball can be modeled by the equation $y = -0.04x^2 + 0.84x + 2$, where x is the horizontal distance, in meters, from the athlete and y is the height, in meters, of the ball. How far from the athlete will the ball land?

Below is a list of the different methods you have used to solve a quadratic equation. Let's review when each method should be used.

Graphing

Square roots

Factoring

Completing the square

Quadratic formula

Which method would you use to solve each quadratic equation below?

1. $3x^2 - 9 = 0$

2. $x^2 - x - 30 = 0$

3. $6x^2 + 13x - 17 = 0$

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

5. $-16x^2 - 50x + 21 = 0$

Quadratic equations can have two, one, or no real-number solutions. Before you solve a quadratic equation, you can determine how many real-number solutions it has by using the discriminant. The discriminant is the expression under the radical sign in the quadratic formula-- $b^2 - 4ac$.

Discriminant	$b^2 - 4ac > 0$	$b^2 - 4ac = 0$	$b^2 - 4ac < 0$
Number of Solutions	There are two real-number solutions.	There is one real-number solution.	There are no real-number solutions.

Ex. How many real number solutions does $2x^2 - 3x = -5$ have?

Ex. How many real number solutions does $6x^2 - 5x = 7$ have?

Lesson 9.6 Day 2 Warm Up

1. Solve for x : $x^2 - 7x - 18 = 0$

2. What is the vertex of $x^2 + 8x - 7$?

3. Factor: $36x^2 - 49$

Ex. Solve for x : $2x^2 - 9x + 12 = 0$

Ex. Solve for x : $x^2 - 2x + 3 = 0$

Ex. How many solutions does the quadratic equation have?

1. $x^2 + 3x + 11 = 0$

2. $9x^2 + 12x + 4 = 0$

Ex. A batter strikes a baseball. The equation $y = -0.005x^2 + 0.7x + 3.5$ models its path, where x is the horizontal distance, in feet, the ball travels and y is the height, in feet, of the ball. How far from the batter will the ball land? Round to the nearest tenth of a foot.

Ex. Jacob tosses a football across a playground. The arc of the ball can be modeled by the equation $y = -0.05x^2 + 0.75x + 4$, where x is the horizontal distance (in meters) from Jacob and y is the height (in meters) of the ball. How far from Jacob does the ball land?