

Middle School Algebra Outreach Learning
April 20 - 24, 2020

***Algebra I* Week of April 20th**

If there are any questions,
please feel free to email me at
rheaburnsl@lpisd.org.

Please use the given links to access
your class period's TEAMS folder:

Previous Lessons: Solving quadratic
equations by using the square root
method, examining vertex form of
quadratic equations and solving
using factored form.

Objectives

Objective / I Can:

- Explore the quadratic formula
- Determine the meaning of a positive, negative or zero discriminant

Activities

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Lesson 1: The Quadratic Formula

- 1) [Quadratic Formula Song](#)
- 2) [Video Lesson](#) (If you have access to a printer, you can print out this page to follow along with the lesson. If not, grab a piece of notebook paper and write the questions as you go.)

| Main Ideas/Questions | Notes/Examples | |
|---|---|------------------------|
| <div>THE QUADRATIC FORMULA</div> <div>$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$</div> | The quadratic formula is another method to use to solve a quadratic equation. Solve the equation below using the quadratic formula. | |
| | <div>StepsExample</div> | |
| | ❶ Make sure the equation is set equal to 0 and written in standard form . | $x^2 - 5x - 36 = 0$ |
| | ❷ Identify <i>a</i> , <i>b</i> , and <i>c</i> . | |
| | ❸ Substitute these values into the formula and SIMPLIFY! | |
| YOU TRY! | Directions: Solve each equation using the quadratic formula. | |
| | 1. $x^2 - 8x = 20$ | 7. $x^2 + 7x = x - 10$ |
| | 3. $3x^2 - 12 = 0$ | 4. $x^2 + 15x = 6x$ |
| | 5. $-x^2 - 10x - 21 = 0$ | 6. $4x^2 + 9x = 12x$ |
| | | |

From Video

From Video

QUIZIZZ FOR GRADE:

2ND PERIOD CODE : 420104

6TH PERIOD CODE : 935827

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Lesson 2: The Discriminant and Number of Solutions

- 1) [Video Lesson](#) (If you have access to a printer, you can print out this page to follow along with the lesson. If not, grab a piece of notebook paper and write the questions as you go.)

| THE DISCRIMINANT | Formula: | | > If $d > 0$, then there are ____ solutions. > If $d = 0$, then there are ____ solutions. > If $d < 0$, then there are ____ solutions. | |
|---|---|--|---|--|
| | | | | |
| EXAMPLES Use the discriminant to determine the number of solutions. | 7. $y = x^2 + 5x + 4$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | | 8. $y = x^2 - 3x + 10$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | |
| | 9. $y = x^2 + 10x + 25$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | | 10. $y = 2x^2 - 4x - 3$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | |
| | 11. $y = 4x^2 - 12x + 9$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | | 12. $y = -3x^2 + 5x - 8$ <input type="checkbox"/> 2 solutions <input type="checkbox"/> 1 solution <input type="checkbox"/> 0 solutions | |

- 2) Read Khan Academy Article (by clicking [this link](#) OR the screen clipping on next page)
- 3) Forms (FOR GRADE)

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Quick review of the quadratic formula

The quadratic formula says that

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \text{for any quadratic equation like:}$$

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

What is the discriminant?

The **discriminant** is the part of the quadratic formula under the square root.

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

The discriminant can be positive, zero, or negative, and this determines how many solutions there are to the given quadratic equation.

- A **positive** discriminant indicates that the quadratic has **two distinct real number solutions**.
- A discriminant of **zero** indicates that the quadratic has a **repeated real number solution**.
- A **negative** discriminant indicates that **neither of the solutions are real numbers**.

Example

We're given a quadratic equation and asked how many solutions it has:

$$6x^2 + 10x - 1 = 0$$

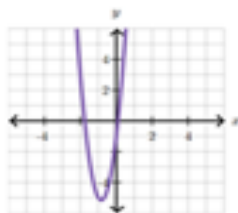
From the equation, we see:

- $a = 6$
 - $b = 10$
 - $c = -1$
- Plugging these values into the discriminant, we get:

$$\begin{aligned} & b^2 - 4ac \\ &= 10^2 - 4(6)(-1) \\ &= 100 + 24 \\ &= 124 \end{aligned}$$

This is a positive number, so the quadratic has two solutions.

This makes sense if we think about the corresponding graph.



Notice how it crosses the x -axis at two points. In other words, there are two solutions that have a y -value of 0, so there must be two solutions to our original equation: $6x^2 + 10x - 1 = 0$.

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Academic/Instructional Support

Schedule :

Students should begin work on Tuesday, 4/21 and should be completed no later than Monday, 4/23 at 8 a.m.

This assignment should take less than 2 hours to complete.

Office Hours:

Wednesdays 9 – 11 a.m. & Fridays 1 – 3 p.m.

Please email me anytime, and I will get back to you as soon as I can.

To Be Graded

Assignment for students to submit:

- Quizizz on solving using the quadratic formula
- Forms submission- practice with discriminant (See Assignment tab)

When is it due? All assignments are due no later than Monday, April 27th at 8:00am.

What assignments will the student submit?

1. Quadratics solving Quizizz
2. Forms submission (See Assignments tab)

How will it be submitted?

All assignments are to be submitted electronically via Quizizz and Microsoft Forms except by individual arrangement.