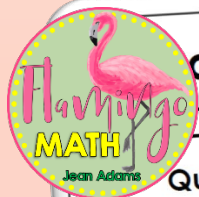


Algebra 2 Honors

Quadratic Formula



Lesson 7: The Quadratic Formula

Quadratic Formula – a method used to find solutions to the quadratic equation $ax^2 + bx + c = 0, a \neq 0$

The Quadratic Formula is

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

In a quadratic equation of the form, $ax^2 + bx + c = 0$, the value of the expression $b^2 - 4ac$ is known as the discriminant. This value is helpful in determining the types of roots for the equation.

Three Possible Cases

Completely Editable

4.7

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Three Possible Cases

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



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



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



The input value(s) or x-coordinate for which the output value or y-coordinate is zero is commonly called a _____ of the quadratic.

EX #1: Solve. $x^2 + 4x - 3 = 0$

EX #2: Solve. $x^2 + 4x = -4$

EX #3: Solve. $6x - 5 = -x^2$

EX #4: Solve. $2x^2 + x - 6 = 0$

Using the Discriminant

EX #5: What is the number of real solutions of each equation?

A. $2x^2 - 3x + 7 = 0$

B. $x^2 = 6x + 5$

C. $x^2 + 13x + 4 = 0$

D. $x^2 - 6x + 9 = 0$

Applying the Quadratic Formula

EX #6: The equation $d = 120t - 5t^2$ models the height of a fireworks charge on the 4th of July, where t is in seconds, and d is in meters.

A. Calculate the height after 3 seconds.

B. When will the rocket reach 450 meters?

C. When does it reach its highest point?

D. What is the highest distance reached?

Using the Discriminant to Solve a Problem

EX #7: The weekly revenue R for a company is $R = -3p^2 + 62p + 1080$ where p is the price of the company's product. Use the discriminant to find whether there is

Application

EX #8: Your club is selling boxes of cookie mix as a fundraiser. The total profit p depends on the amount x that your club charges for each box of cookie mix. The equation $P = -0.5x^2 + 30x - 120$ models the profit of the fundraiser. What's the smallest amount, in dollars, that you can charge and make a profit of at least \$150?

NOTES

Name _____ Date _____

4.7

The Quadratic Formula Practice

Problems 1 – 6, evaluate the discriminant of the equation. Tell how many solutions each equation has and whether the solutions are real or imaginary.

1. $y = x^2 + 8x + 16$

2. $y = 4x^2 - 5x + 1$

3. $y = x^2 + 7x + 9$

4. $y = -4x^2 - 4x - 1$

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

6. $y = 9x^2 - 24x$

Problems 7 – 16, solve each equation using the Quadratic Formula. Give exact solutions and approximate solutions rounded to the nearest hundredth.

7. $2x^2 + 3x - 5 = 0$

8. $x^2 = 3x + 2$

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

10. $2x^2 - 5x$

11. $2x^2 + 6x = 3$

12. $2x^2 + 5x = 0$

13. $x^2 + x = 6$

14. $x^2 - 13x = 48$

15. $x^2 + 6x + 3 = 0$

16. $x(2x - 3) = 9$

Practice Sets

Lesson Warm-Ups

Name _____ Date _____ Period _____	
Lesson 4.7: The Quadratic Formula Warm-Up # 1	
1. What is the discriminant, and what does it tell you?	2. What is the discriminant for the function: $8x^2 + 6x = -5$
3. How many and what type of solutions would the function have?	4. What are the solution(s).

Name _____ Date _____	
Lesson 4.7: The Quadratic Formula	
1. What is the discriminant, and what does it tell you?	2. What is the
3. How many and what type of solutions would the function have?	4. What are

4.7 The Quadratic Formula Form A
Name _____
Date _____ Period _____
Questions 1 – 3, use: $2x^2 - 4x - 7 = 0$
1. Find the discriminant.
2. What is the number of real solutions for the equation?
3. Use the Quadratic Formula to solve. Simplify completely.

4.7 The Quadratic Formula Form B
Name _____
Date _____ Period _____
Questions 1 – 3, use: $2x^2 + 6x - 3 = 0$
1. Find the discriminant.
2. What is the number of real solutions for the equation?
3. Use the Quadratic Formula to solve. Simplify completely.

Daily Lesson Quiz

Grade: _____

Grade: _____