Chapter 9 Quadratic Equations and Functions

9.1 Graph y=ax² + c

Quadratic Functions

- Highest _____
- Standard Form: _____
- Parabola the ______
 function





of a quadratic

- Vertex the _____ on a parabola
- Axis of symmetry the line passing through the ______ that divides the parabola into



Graph of a Quadratic Function

- $y = ax^2 + bx + c$
- Positive a parabola opens _____
- Negative a parabola opens _____
- To find the ______ of the vertex: $X = \frac{-b}{2a}$

To Graph a Quadratic Equation

• 1) Find the ______ of the vertex

• 2) Find the ______ of the vertex by ______ from Step 1.

• 3) Make a	of values.
 Pick two values 	and two
values	the x-coordinate of
the vertex.	
• Use these	

4) Plot the points and connect them with a ______ to form a ______

• Graph: $y = x^2$

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• Graph:
$$y = x^2 - 4$$

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• Graph:
$$y = -2x^2 - 1$$

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9.3 Solve Quadratic Equations by Graphing

To solve by graphing:

• 1) Get the equation in ______ set equal to _____

• 2) ______ the corresponding function.

• 3) The ______ on the graph are the ______ to the equation.

Number of Solutions:



EX: Solve the equation by graphing.

• $X^2 + X = -1$





• $-x^2 + 6x = 9$

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• $\frac{1}{2}x^2 + 2x = 6$

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- A baseball player throws a ball into the air with an initial vertical velocity of 32 feet per second. The ball is released at a height of 5 feet.
 - Write an equation that models the height h (in feet) of the ball as a function of the time t (in seconds) after it is thrown.
 - Use the equation to find the time that the ball is in the air if the player lets the ball drop to the ground.





9.4 Use Square Roots to Solve Quadratic Equations

Square Root Method

- NOTE: You can only use this method if the quadratic equation is in the form of _____
 - No _____
- 1) _____ on _____ of the equation.

of

- 2) Take the ______
 of the equation.
 - Positive number:
 - Zero:
 - Negative number:

NOTEBOOK EXAMPLE #1

EX: Solve the equation.

- $C^2 25 = 0$
- $5X^2 + 12 = -8$
- $2X^2 + 11 = 11$
- $9m^2 = 100$

NOTEBOOK EXAMPLE #2 EX: Solve the equation.

- Round the solutions to the nearest hundredth.
- $X^2 + 4 = 14$
- $2p^2 7 = 2$

NOTEBOOK EXAMPLE #3 EX: Solve the equation.

- Round the solutions to the nearest hundredth if necessary.
- $2(x-2)^2 = 18$

•
$$\frac{3}{2}(n+1)^2 = 33$$

EX:

 You drop a towel from a balcony 18 feet above your pool deck onto a table that is 3 feet above the ground. How long is the towel in the air? Round your answer to the nearest hundredth.



9.6 Solve Quadratic Equations by the Quadratic Formula

Quadratic Formula

 The solutions of the quadratic equation ax² + bx + c =0 can be found using the quadratic formula:

- NOTE:
- NOTE: The quadratic formula can be used to solve _____ quadratic equation.

NOTEBOOK EXAMPLE #4 EX:

- Use the quadratic formula to solve the equation. Round your solutions to the nearest hundredth, if necessary.
- $4X^2 = 7X + 2$
- $7n + 5 = -3n^2 + 2$

EX:

For the period 1990 – 2003, the number of book titles published by a small publishing company can be modeled by the function y=0.5x² + 4x + 19, where x is the number of years since 1990. In what year did the company publish 80 books?





