

Name: _____

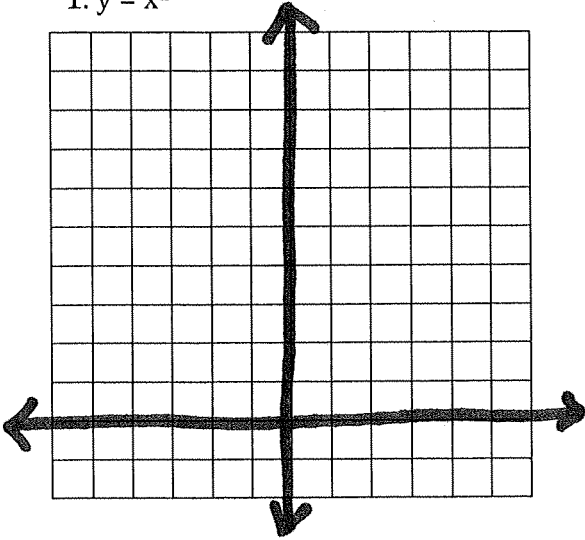
Algebra Ch. 9

Algebra 9-1: Quadratic Equations $y = ax^2$

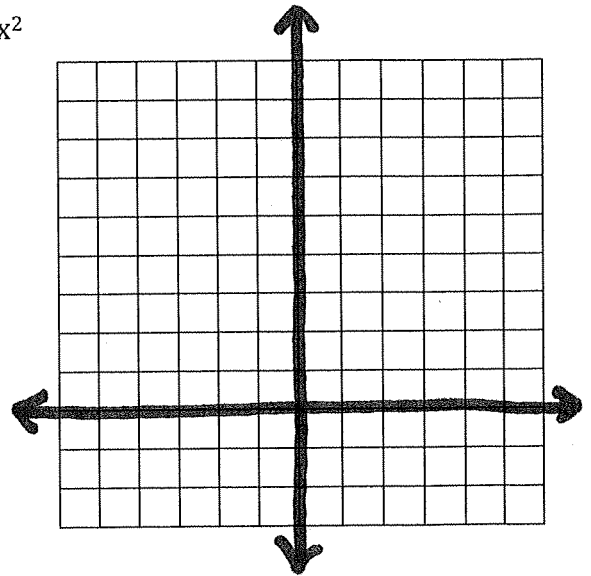
Graph without a calculator.

1. Make a _____. Put ____ in one column and ____ in the other. Pick ____-values and find their corresponding ____ values. Remember to use _____ or order of operations when finding values.
2. Plot the _____.
3. You can always use _____ to help plot points.

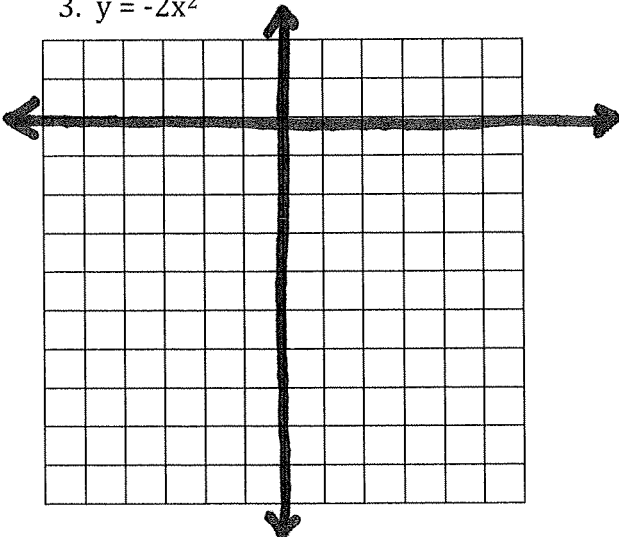
1. $y = x^2$



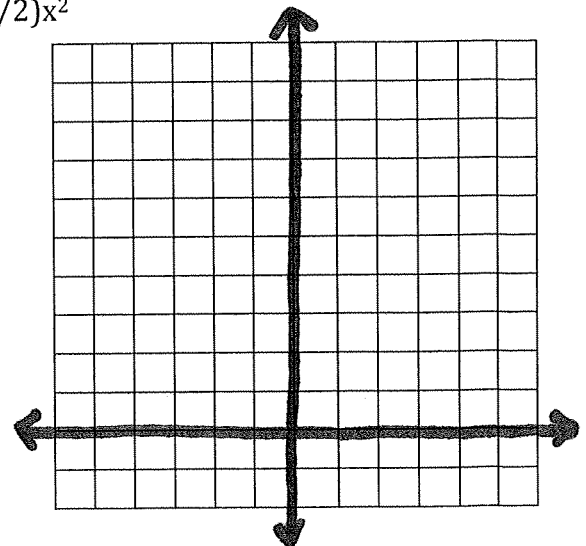
2. $y = 2x^2$



3. $y = -2x^2$



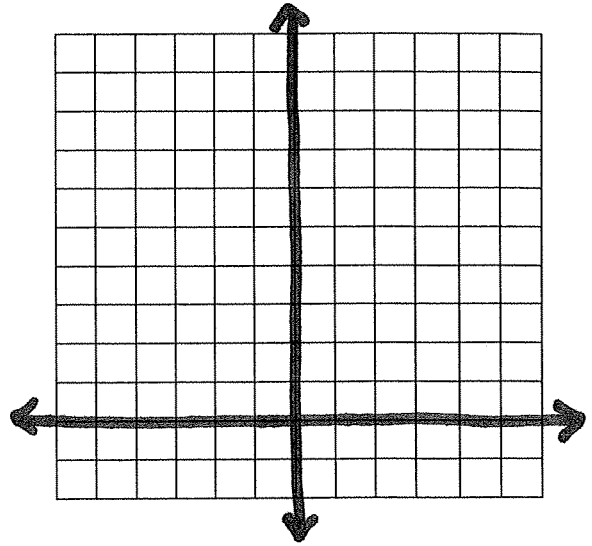
4. $y = (1/2)x^2$



A _____ is created when _____.

On the graph to the right, label/draw the following:

- Parabola
- Axis of Symmetry
- Vertex
- Maximum
- Minimum
- Opening up
- Opening down



*When an object is dropped use _____, where $d =$ _____ in feet and $t =$ _____ in seconds.

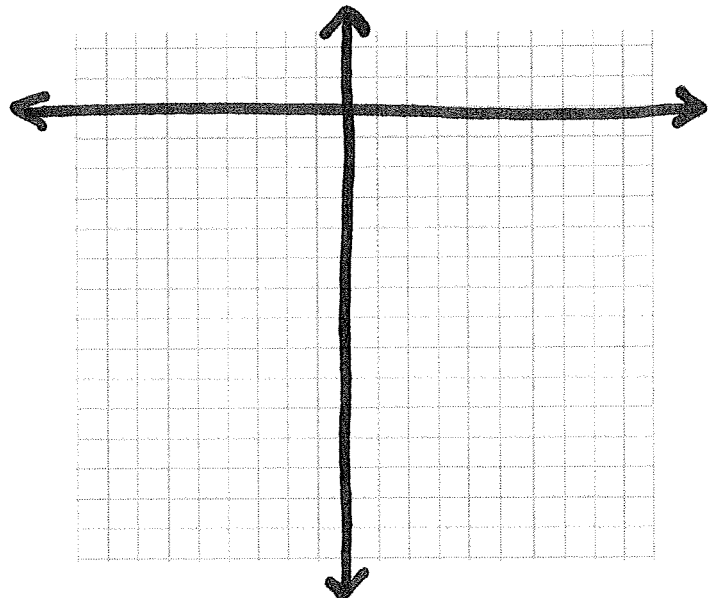
Assignment: 9-1 #'s Pg. 656 6-10, 9-1A Wkst

Algebra 9-2: Quadratic Equations $y = ax^2 + bx + c$

Warm-Up

Graph without a calculator.

1. $y = (-1/4)x^2$

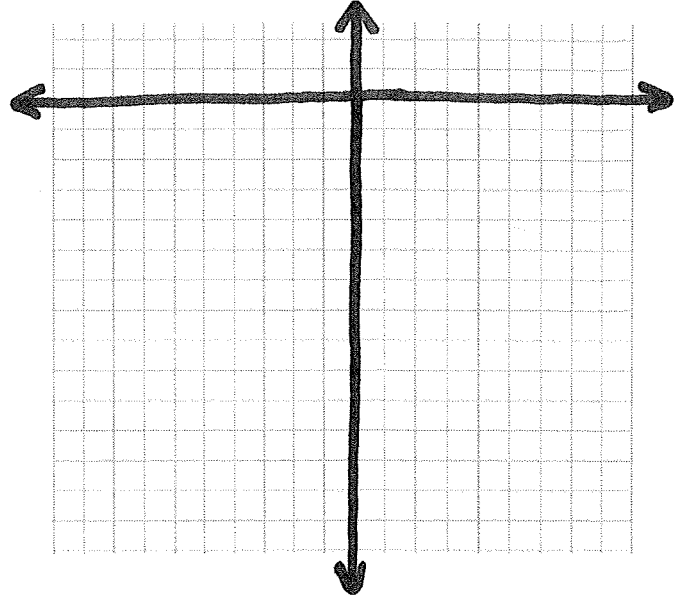


Algebra 9-2: Quadratic Equations $y = ax^2 + bx + c$

Graph without a calculator. Make a _____. Use x values -3, -2, -1, 0, 1, 2, 3. Find their corresponding _____ - _____. Remember to use _____ when solving.

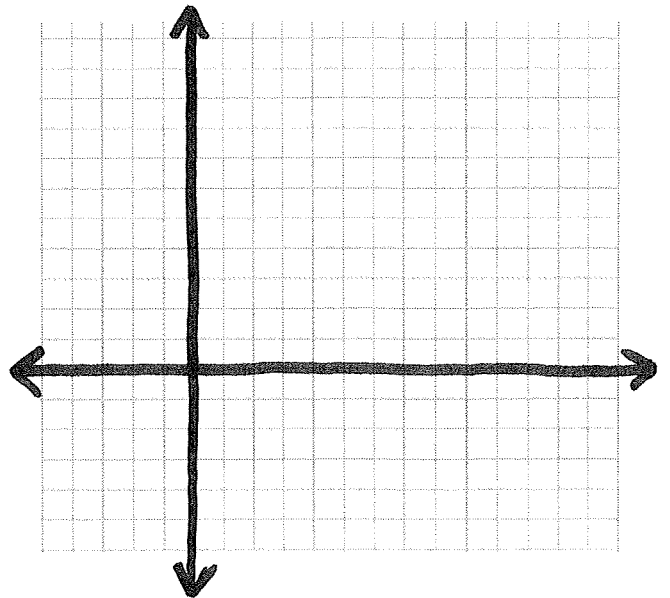
1. $y = -2x^2 - 1$

- Identify the vertex. _____
- Is there a max or min? _____
- Identify the y-intercept. _____
- Identify the x-intercept. _____
- Identify the line of symmetry. _____
- What are the x-coordinates when $y = 3$? _____



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

- Identify the vertex. _____
- Is there a max or min? _____
- Identify the y-intercept. _____
- Identify the x-intercept. _____
- Identify the line of symmetry. _____



What do you notice?

- a, b, and c will affect _____

- parabola is _____
- $a > 0$ then _____
- $a < 0$ then _____

Assignment: 9-2 Wkst

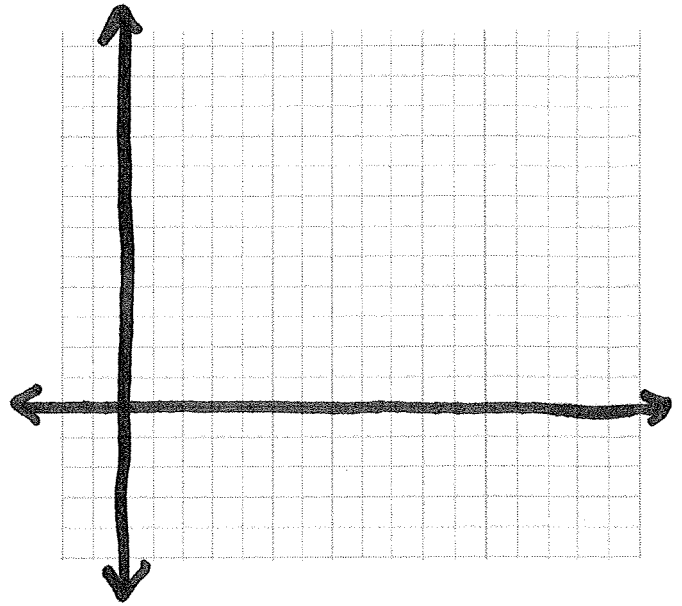
Algebra 9-3: Graphing on a Graphing Calculator

Warm-Up

Graph without a calculator.

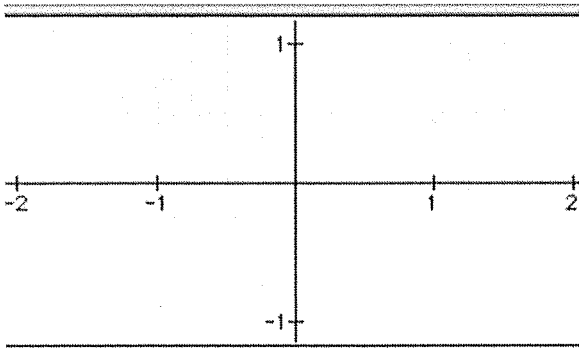
1. $y = x^2 - 6x + 6$

- Identify the vertex. _____
- Is there a max or min? _____
- Identify the y-intercept. _____
- Identify the x-intercept. _____
- Identify the line of symmetry. _____



Algebra 9-3: Graphing on a Graphing Calculator

Window: _____



Draw a window that represents the following ranges.

$$-5 < x < 5$$

$$-10 < y < 10$$

How to Graph on a Graphing Calculator

- Press the _____ key and type in your _____.
 - Make sure to consider _____ and use _____ if you need to.
- Set the window by pressing _____.
 - Enter ___ - _____ and ___ - _____ then ___ - _____ and ___ - _____.
- Press _____.
- Extra Features: _____ & _____.

Examples

Equation	Vertex	Max. or Min.	Axis of Symmetry	x - intercepts
$y = x^2$				
$y = x^2 - 2x$				
$y = x^2 - 4x$				
$y = x^2 - 5x$				

a. How are the graphs similar?

- _____
- _____

b. How are the graphs different?

c. Without graphing, describe the graph of $y = x^2 - 50x$.

Equation	x - intercepts	Vertex	Axis of Symmetry	y - intercept
$y = x^2 - 10x + 21$				
$y = x^2 - 8x + 7$				
$y = x^2 - 4$				

a. How does the x-coordinate of the vertex relate to the x- intercepts?

b. How do you easily find the y-intercept of a graph from its equation?

Assignment: 9-3 #'s 3, 7-11, 17-19

Warm-Up

1. What is a projectile? Give 3 examples that include a drawing.
2. A quadratic equation must have an _____ symbol and a variable to the _____ power. 2 different examples of quadratic equations are _____ and _____.
3. The equation $h = -.025x^2 + x + 6$ describes a football being thrown. "h" represents height and x represents the yards traveled. (Use the graph on page 568.)
 - a. A receiver is 40 yards down the field. How high is the football? _____
 - b. At what two times is the ball 9 feet in the air? _____
 - c. A defender is 3 yards in front of the receiver. Can the defender deflect that ball? Why or why not? _____

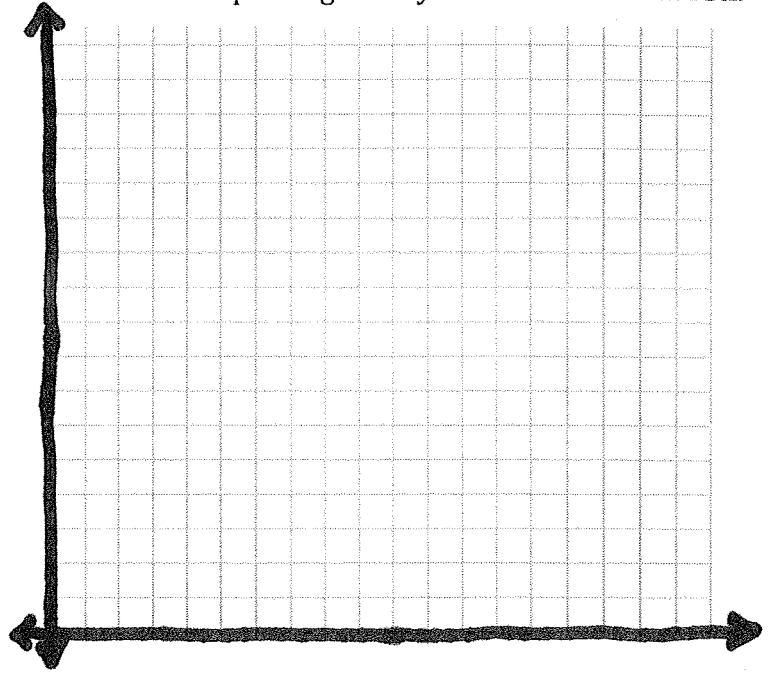
Algebra 9-4: Applications for Quadratics

Examples

1. A formula relating speed x (in mph) of some cars and the stopping distance d (in feet) is $d = .05x^2 + x$.
 - a. If a car is traveling 55 mph, what is the expected stopping distance? _____
 - b. If a car is traveling 25 mph, what is the expected stopping distance? _____

2. A model rocket is shot at an angle into the air from the launch pad. The height, h , of the rocket when it has traveled horizontally x feet from the launch pad is given by $h = -.163x^2 + 11.43x$.

a. Graph this equation.



b. A 75-foot tree, 10 feet from the launch pad, is in the path of the rocket. Will the rocket clear the top of the tree? Why or why not? _____

c. Estimate the maximum height that the rocket will reach. _____

3. The rocket's height h at t seconds after launch is given by $h = -22.2t^2 + 133t$.

a. Graph this equation. (Use graphing calculator to save time.)

b. How high is the rocket at 2 seconds? _____

c. Use the graph to estimate how many seconds it will take for the rocket to reach its maximum height. _____

d. How many seconds will it take for the rocket to hit the ground? _____

Algebra 9-5 Solving Quadratic Equations- Day I

Warm-Up

Simplify 1-3.

1. 3 ± 4

2. $\frac{3 \pm 4}{2}$

3. $\frac{-2 \pm 10}{4}$

Evaluate each expression when $a = 4$, $b = -5$ and $c = 1$.

4. $-b$

5. $b^2 - 4ac$

6. $\sqrt{b^2 - 4ac}$

7. $-b + \sqrt{b^2 - 4ac}$

8. $-b - \sqrt{b^2 - 4ac}$

9. $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Algebra 9-5 Solving Quadratic Equations- Day I

The Quadratic Formula

If $ax^2 + bx + c = 0$ and $a \neq 0$, then we can solve for x .

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

Standard Form: $ax^2 + bx + c = 0$

Identify a, b, and c values for each equation for numbers 1-6.

1. $x^2 + 2x + 27 = 0$ a = b = c =

2. $-t^2 + 1.5t - 10 = 0$ a = b = c =

3. $3f^2 - 6f - 45 = 0$ a = b = c =

4. $n^2 - 3n = 14$ a = b = c =

5. $m^2 - 2m = 0$ a = b = c =

6. $3x = 2x^2 - 12$ a = b = c =

Use the quadratic formula to solve each equation for the given variable.

7. Solve for t. $3t^2 - 6t - 45 = 0$

8. Solve for m. $m^2 - 3m = 14$

9. Solve for z. $z^2 - 2z = 0$

Assignment: 9-5 #'s 1-3, 10-13

Algebra 9-5 Solving Quadratic Equations- Day 2

Warm-Up

1. What is the quadratic formula? _____
2. When do we use the quadratic formula? _____
3. What do our solutions represent? _____
4. When solving a quadratic, the _____ must be in _____, which means it is equal to _____.
5. Before solving we must find our _____, _____, and _____ values.
6. Once you have solutions, you can check your answer(s) by _____ or _____.
7. Identify a, b, and c values for the following quadratic equation. $-x^2 + 3x = 25$ _____
8. Solve $p^2 - 10p + 16 = 0$.

Algebra 9-5 Solving Quadratic Equations- Day 2

Exact Solution	Rounded Solution

Examples

1. Find the **exact** solutions for $t^2 + 5t = 3$

2. The formula $y = -x^2 + 2x + 27$ represents a diver diving, where y is the meters above water and x is the meters away from the cliff.

$y =$ _____

$x =$ _____

a. How far is the diver away from the cliff when she...

i. hits the water? _____

ii. is 10 meters above the water? _____

Assignment: 9-5 #'s 4, 5 – 8, 15a (can check answer on graphing calculator), 17 - 21

Warm-Up

1. What is the quadratic formula? _____
2. When do we use the quadratic formula? _____
3. When solving a quadratic, the _____ must be in _____, which means it is equal to _____.
4. Solve $x^2 + 4x = 5$.

Algebra 9-6 Analyzing Solutions to Quadratic Equations

The **discriminant** is used to _____.

Discriminant = _____

Positive → _____

Negative → _____

Zero → _____

Examples

3. **How many** real solutions does the equation $25x^2 - 10x + 1 = 0$ have? _____
4. **How many** real solutions does the equation $x^2 + 4 = -6x$ have? _____
5. **How many** real solutions does the equation $3x^2 + 5x + 7 = 0$ have? _____
6. **How many** real solutions does the equation $x^2 + 38 = 0$ have? _____

Back to the diver from yesterday...

7. The formula $y = -x^2 + 2x + 27$ represents a diver diving, where y is the meters above water and x is the meters away from the cliff.

$y =$ _____

$x =$ _____

Will the diver reach a height of...

a. 27.5 meters? _____ Why or why not? _____

b. 28 meters? _____ Why or why not? _____

c. 29 meters? _____ Why or why not? _____

Assignment: 9-6 #'s 7 - 16