Quadratics Day 1

Agenda

Warm-Up

Set up Unit 9

Notes (book)

HW - Practice #1-10

Reminders

Quiz Friday

HW 5.4 & PR Due Friday

EOC Simulation Tues 3/31

Warm-Up Monday

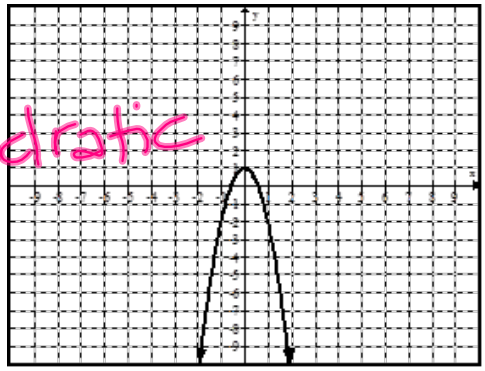
1. Which of the following is the parent function of the graph below?

A. $y = x$

B. $y = x^2$ Quadratic

~~C.~~ $y = -x^2$

~~D.~~ $y = -x$



2. In one (school-appropriate) word, describe your spring break.

On page 101 and 102, set up Unit 9.
Put your "9" tab on 101.

UNIT 9

TITLE: 101

Quadratics

Page #	Page Title
102	Words Worth Knowing
103-105	Quadratics Book

Right hand side

102 Unit 9 Words Worth Knowing

UNIT 9: QUADRATIC FUNCTION:

- Quadratic Parent Function
- Domain
- Range
- Vertex
- Line of Symmetry
- Concavity
- Minimum
- Maximum
- X-intercepts
- Roots
- Zeroes
- Solutions
- Standard Form
- Quadratic Regression
- Evaluate
- Stretch
- Compression
- Translate
- Reflect
- Graphing
- Square Roots
- Factoring
- Quadratic Formula
- Discriminant

Left hand side

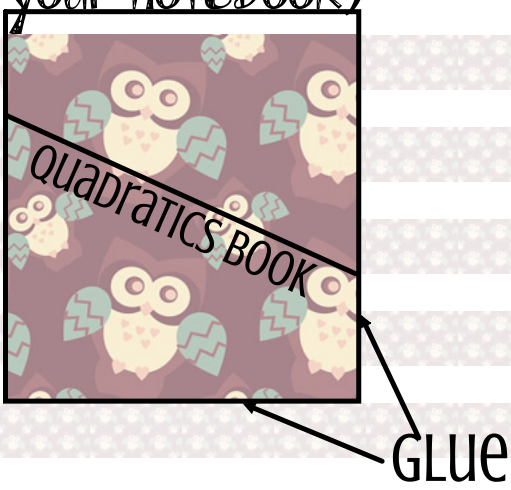
Quadratics Day 1

Quadratic Functions Book

Your notes for the next 3 days are in the blue & white book. Arrange the pages in numerical order, then fold in half!HINT: the blue page goes on the outside.

Make a pocket on page 103-105 (next 2 pages in your notebook)

Using the next 2 pages in your notebook, make a pocket. Fold one page diagonally, then glue its edges onto the other page. Your booklet will going this pocket.

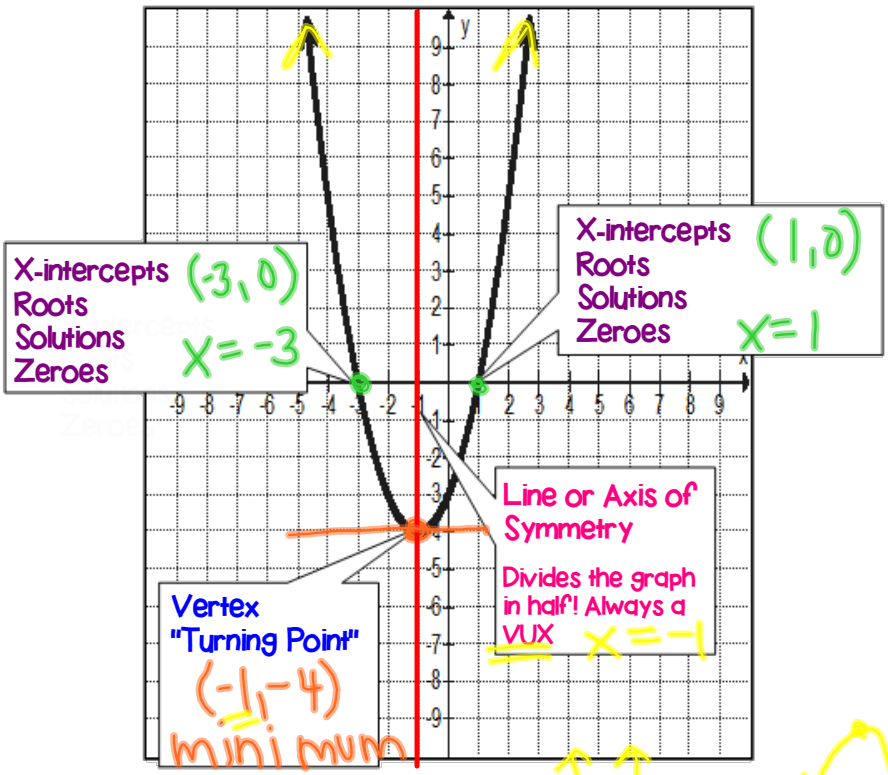


Quadratics Day 1
Algebra I Unit 9

Introduction to Quadratic FUNCTIONS

Also known as a parabola

Parts of a Quadratic



Concavity: describes if the parabola opens up (minimum) or opens down (maximum)

Domain: All the X-Values

2 arrows → All real numbers
$\mathbb{R}$

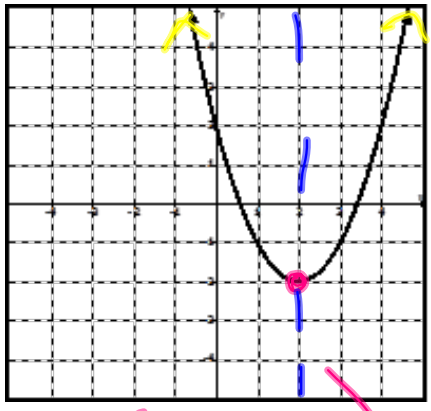
$\{x \mid x \in \mathbb{R}\}$

Range: All the Y-Values $y \geq -4$

$y \leq max$ $y \geq min$

Vertex of a Parabola page 2

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



Vertex: (2, -2)

Line of Symmetry: x = 2

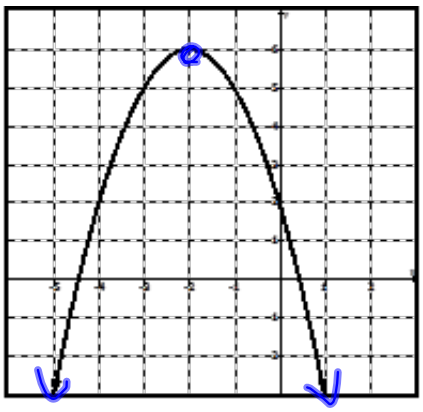
Minimum or Maximum

Concavity: up

Domain: $\mathbb{R}$

Range: $y \geq -2$

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



Vertex: (-2, 6)

Line of Symmetry: x = -2

Minimum or Maximum

Concavity: down

Domain: $\mathbb{R}$

Range: $y \leq 6$

Quadratic Parent Function

Equation

$y = x^2$

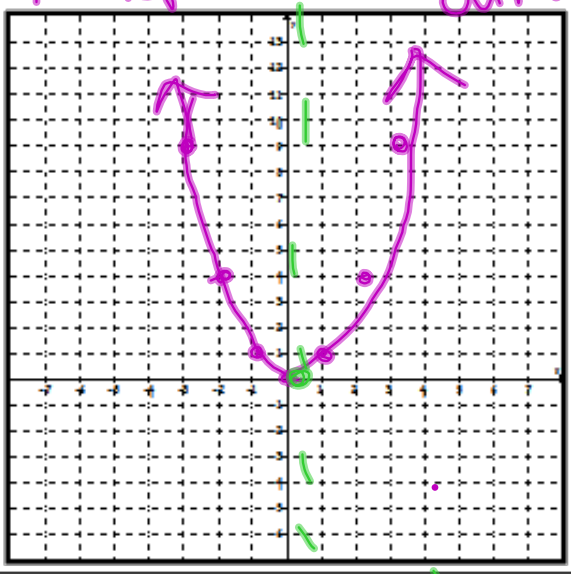
Table

x	y
-3	$(-3)^2 = 9$
-2	$(-2)^2 = 4$
-1	$(-1)^2 = 1$
0	0
1	1
2	4
3	9

Graph

U-shaped

smooth curve



DOMAIN $\mathbb{R}$

RANGE $y \geq 0$

Minimum or Maximum

Concavity UP

Vertex ORIGIN (0,0)

LINE OF SYMMETRY

$x = 0$

(y-axis)

Line of Symmetry page 2

Standard Form

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

a, b, c are numbers

~~Put the following equations in Standard Form~~

Solve for y

1. $3x^2 + y = -5x + 4$

$-3x^2 \qquad -3x^2$

$y = -5x + 4 - 3x^2$

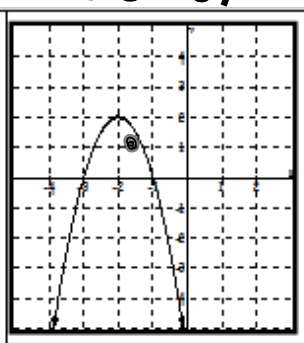
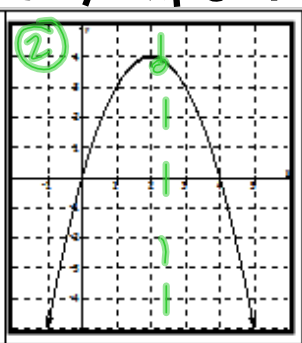
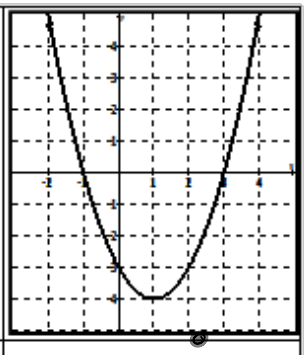
Reorder

$\boxed{y = -3x^2 - 5x + 4}$

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

$y = x^2 + 7x - 3$

Line of Symmetry Exploration

Graph			
Vertex		(2,4)	
Line of Symmetry	$x =$ (-2,2) -2	X=2	(1,-4) X=1
Function	$y = -2x^2 - 8x - 6$	$y = -1x^2 + 4x$	$y = x^2 - 2x - 3$
a	a=-2 b=-8 c=-6	a=-1 b=4 c=0	a=1 b=-2 c=-3
b	-8	-1 4	1
$-\frac{b}{2a}$	$-\frac{(-8)}{2(-2)} = \frac{8}{-4} = -2$	$-\frac{(4)}{2(-1)} = \frac{-4}{-2} = 2$	-2 $-\frac{(-2)}{2(1)} = \frac{2}{2} = 1$

Equation of the Line of Symmetry: $X = \frac{-b}{2a}$

Find the Axis of Symmetry of each of the following parabolas.

1. $y = 2x^2 + 12x - 7$

a=2 b=12 c=-7

$X = \frac{-12}{2(2)} = \frac{-12}{4} = -3$

2. $y = 4x + x^2 - 8$ not standard

$y = x^2 + 4x - 8$

a=1 b=4 c=-8

$X = \frac{-4}{2(1)} = \frac{-4}{2} = -2$ $\boxed{X = -2}$

HW #1-10

You must bring your graphing calculator tomorrow!!!

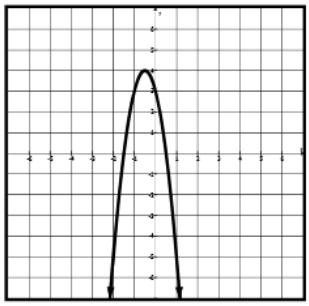
Algebra I – Unit 9: Topic 1 – Introduction to Quadratic Functions

Practice – Introduction to Quadratic Functions **pp 590-605**

Name _____ Date _____ Period _____

State the domain and range of each quadratic function graphed below.

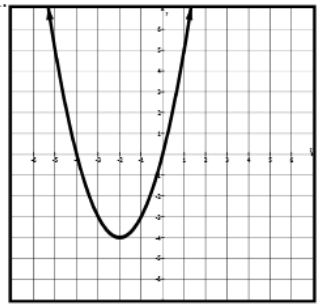
1.



Domain: _____

Range: _____

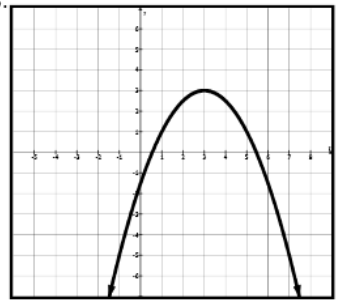
2.



Domain: _____

Range: _____

3.

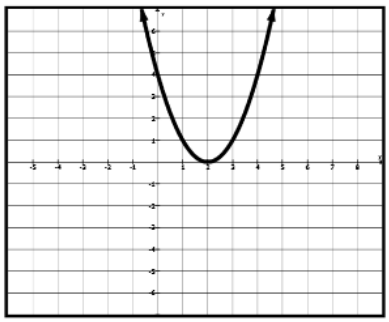


Domain: _____

Range: _____

Find the information using the graphs below.

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



a = _____, b = _____, c = _____

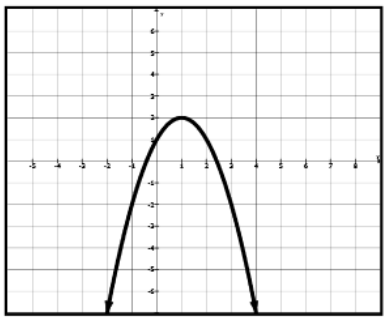
Vertex: _____

Line of Symmetry: _____

Minimum or Maximum

Concavity: _____

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



a = _____, b = _____

Vertex: _____

Axes of Symmetry: _____

Minimum or Maximum

Concavity: _____

Algebra I - Unit 9: Topic 1 – Introduction to Quadratic Functions

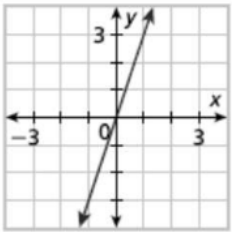
Find the line of symmetry of each of the following parabolas, show work.

6. $y = x^2 + 3x + 4$

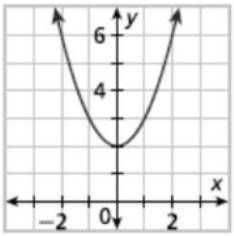
7. $2x^2 - 8x = -3 + y$

8. Which of the following has a parent function of $y = x^2$.

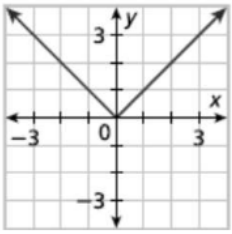
A



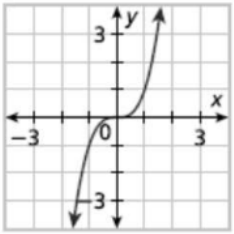
C



B



D



9. Which of the following functions has a graph with an axis of symmetry of $x = -\frac{1}{2}$?

A $y = 2x^2 - 2x + 5$

B $2x + 5 = 2x^2 - y$

C $2x^2 + y = 2x + 5$

D $2x - y = 5 - 2x^2$

10. Which of the following represents the parent function of $y = -3x + 5 + 5x^2$?

A $y = x$

B $y = -2x$

C $y = |x|$

D $y = x^2$

HW Help: Quadratics Day 1

No work = no credit = no kidding!! (Especially on the back page!)

#1-3. The domain of a quadratic (with arrows) is always all real numbers!

The range depends on the concavity and the y-coordinate of the vertex. Concave up (minimum) will be ≥ and concave down (maximum) will be ≤

#4-5. Once you find the vertex, the line/axis of symmetry is just x = the x-coordinate!

#6-7. Find your a, b, and c values. Make sure your equation says y=! Then plug a & b into x = -b/2a. Simplify if you can.

#8. $y=x^2$ is the quadratic parent function...which graph makes a "u"?

#9 is not easy! Solve each equation for y=. Then name the a, b, and c values of each. Plug into the axis of symmetry equation to find which has x=-1/2. HINT: start from the bottom!

#10. Don't pick any equation we haven't learned yet!!

Need more help? Drop by tutorials!