Quadratics Day 3

Agenda
Warm-Up

HW Check

Notes (finish book)

HW: Practice #1-10

Due Friday:
Signed Progress Report

HW 5.4

Reminders
Quiz Friday

EOC Simulation 3/31

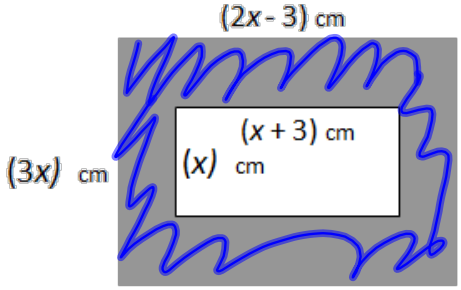
Warm-Up Wednesday

1. Evaluate f(-3) for $f(x) = x^2 + 4x - 3$

$f(-3) = (-3)^2 + 4(-3) - 3$

-6

2. Find the area, in simplest terms, of the shaded region.



A. $5x^2 - 12x$

B. $5x^2 - 6x$

C. $6x^2 - 6x$

D. $6x^2 - 12x$

$A = LW$

$A_{big} - A_{small}$

$3x(2x-3) - x(x+3)$

$6x^2 - 9x - x^2 - 3x$

$5x^2 - 12x$

Questions, Comments, Concerns?

Algebra I - Unit 9: Topic 1 – Introduction to Quadratic Functions Day 2

Practice – Introduction to Quadratic Functions Day 2 **pp 590-611**

Name _____ Date _____ Period _____

Graph the following parabolas.

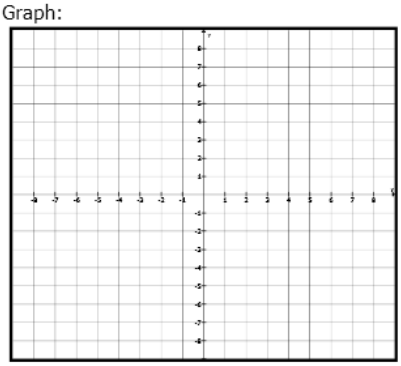
1. $f(x) = x^2 - 2x - 3$

Line of Symmetry: _____
Vertex: _____

Two Values:

x	y

Graph:



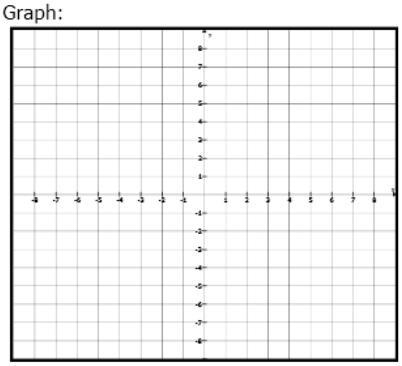
2. $y = -(x-3)^2$

Line of Symmetry: _____
Vertex: _____

Two Values:

x	y

Graph:



Find the vertex of the following quadratics.

3. $y = 5x^2 - 10x + 3$

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

5. $y + 7 = 4x - x^2$

max

$-7 \quad -7$

$y = -x^2 + 4x - 7$

$(2, -3)$

6. For the graph of $f(x) = 4x^2 - 8x + 4$, what is the x-coordinate of its vertex?

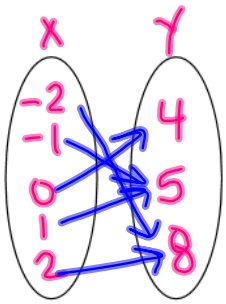
Algebra I - Unit 9: Topic 1 – Introduction to Quadratic Functions Day 2

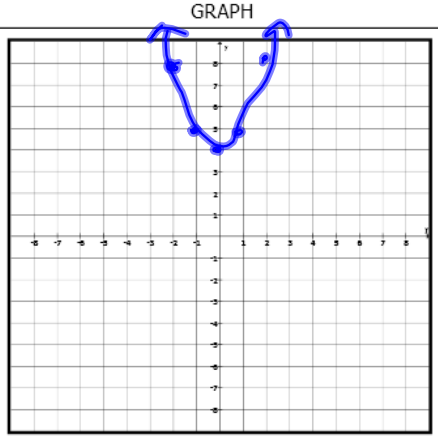
Show all of the indicated representations of the function below.

7. $f(x) = x^2 + 4$

TABLE	MAPPING	GRAPH

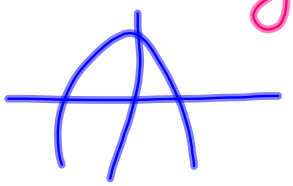
x	y
-2	8
-1	5
0	4
1	5
2	8





8. Which of the following quadratic functions has a maximum?

Solve for y



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

B $y = x^2 + 4x + 16$

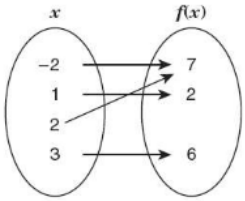
C $y - x^2 + 6 = 9x$

D $y + 3x^2 = 9$

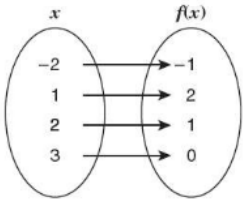
$-3x^2 \cdot 3x^2$ $y = -3x^2 + 9$

9. Which of the following mappings best represents the function $f(x) = -x^2 + 3$?

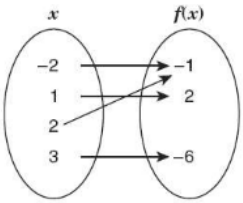
F



H



G



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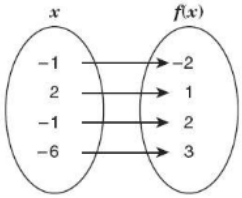


Quadratics Day 3 page 5

Linear VS Quadratic

no exponent → $y = x$

squared → $y = x^2$

From EQUATIONS

1. $y = 3x + 4$ — Linear

2. $f(x) = 5x^2 - 6x + 3$ — quadratic

3. $f(x) = 4 - x$ — Linear

4. $y = 7 - 3x^2$ — quadratic

From TABLES/DATA SETS

plot points → what shape?

5.

x	y
-2	10
-1	7
0	4
1	1

+1, +1, +1 → -3, -3, -3

Linear

slope: $\frac{-3}{1}$

6.

x	y
-3	-12
-2	-2
-1	4
0	6
1	4

V shape

Quadratic

y repeats

7. $\{(-3,14),(-1,0),(2,-6),(3,-4),(5,6)\}$

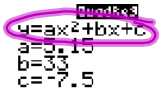
Quadratic

Quadratics Day 3 page 5

Writing Equations of Quadratic Data

If you know your data is quadratic...

Press STAT ENTER



L1	L2
x's	y's

STAT ➡ 5: QuadReg ENTER

Write your equation!

Page 5

1. Find the equation of the parabola that passes through the points (-5, -43.75), (1, 30.65), and (2, 79.1)

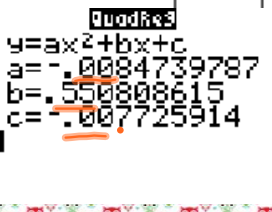
$y = 5.15x^2 + 33x - 7.5$

2. Find the equation that best represents the data in the table.

Quadratic :)

x	y
0	0
17.5	7
32.5	9
47.5	7
65	0

Round to 2 decimals

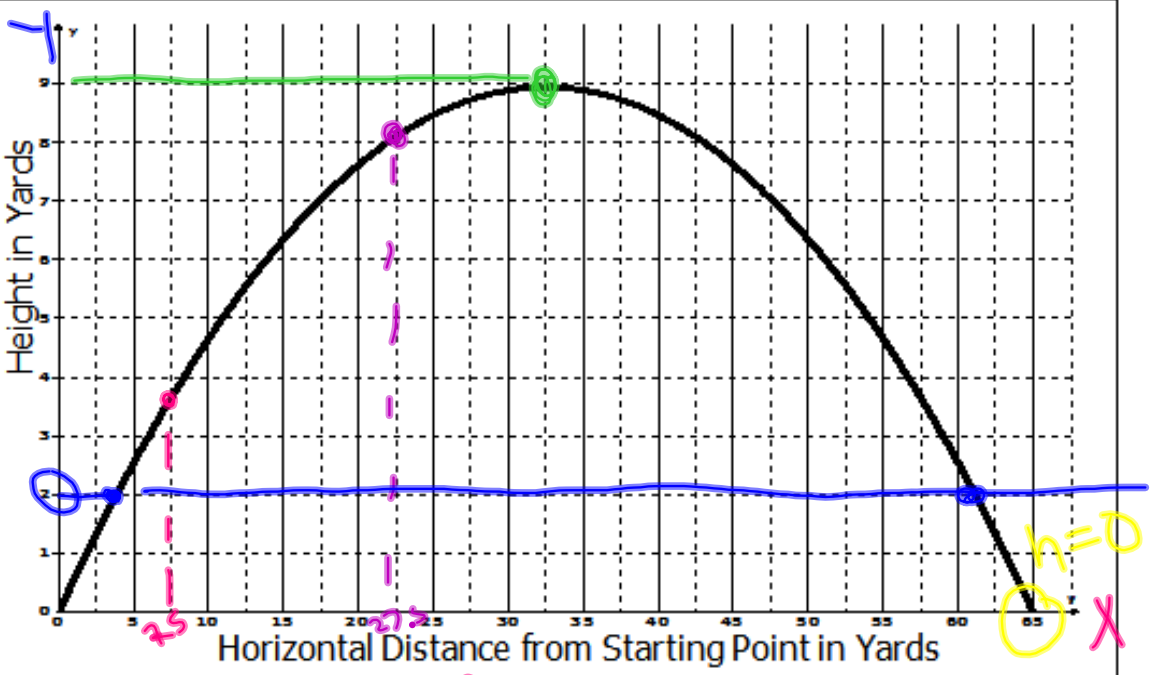


$y = -.01x^2 + .55x - .01$

Quadratics Day 3 page 6

Applications

1. The graph below represents the relationship between the height (in yards) and the horizontal distance (in yards) of a soccer ball after being kicked.



Find the following values:

f(7.5) ≈ 3.5 f(22.5) = 8 When $f(x) = 2$, find the value of x.

What is the maximum height of the ball?

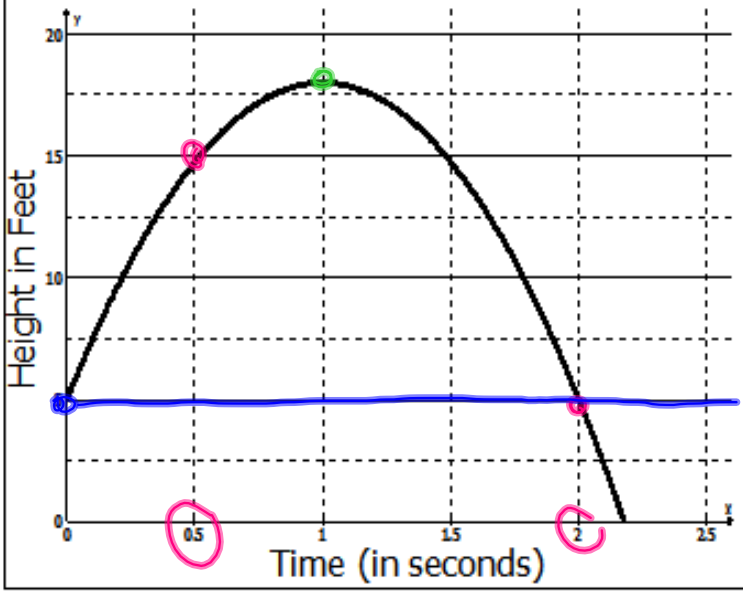
When does the ball touch the ground?

f(x)=y x=7.5 y=2 x≈4 AND 62 9 yards 65 yards away

Quadratics Day 3 page 6

Applications

2. During a basketball game, a shot was taken from midcourt and the basket was made. The equation $h(t) = -13t^2 + 26t + 5$ describes the height (in feet) of the ball t seconds after it was thrown.



Find h(0.5) = 15

Find h(2) = 5

Approximately when is the ball 5 feet in the air?

0 sec & 2 sec

How high did the ball go in the air?

≈16 feet

Quadratics Day 3 page 7 (back)

Evaluating Quadratic Functions

independent → x dependent → y

LABEL, plug in values

y= find GRAPH

1. Given the quadratic function $f(x) = 3x^2 + 2x - 5$ find the dependent variables when the independent variables are {-3, 0, 1, 5}

f(-3)
f(0)

xs

{16, -5, 0, 80}

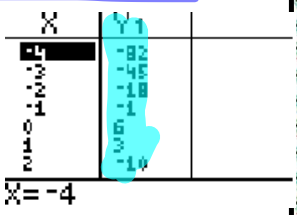
2. Given the quadratic function $f(x) = -5x^2 + 2x + 6$ find the independent variables when the dependent variables are {-82, 6, -109, -577}.

Find x-values

ys

{-4, 0, 5, 11}

3. Given the quadratic equation $f(x) = 2x^2 - 3x + 1$, find



f(-32)

f(1)

f(3)

f(44)

HW #1-10 NO WORK NO CREDIT NO KIDDING!!

Algebra I - Unit 9: Topic 1 – Introduction to Quadratic Functions Day 3

Practice – Introduction to Quadratic Functions Day 3 **pp 590-605**

Name _____ Date _____ Period _____

Tell whether each function is linear, quadratic, or neither.

1. $-3x^2 + x = y - 11$

2.

x	-2	-1	0	1	2
y	-4	0	4	8	12

3. $\{(-10, 15), (-9, 17), (-8, 19), (-7, 21), (-6, 23)\}$

4. $y = -3x + 20$

5.

x	y
-4	8
-2	2
0	0
2	2
4	8

6. A function is described by the equation $f(x) = x^2 - 3$. The replacement set for the independent variable is {-4, -1, 2, 4}. Which of the following is contained in the corresponding set for the dependent variable?

A 6
B 2
C -1
D 13

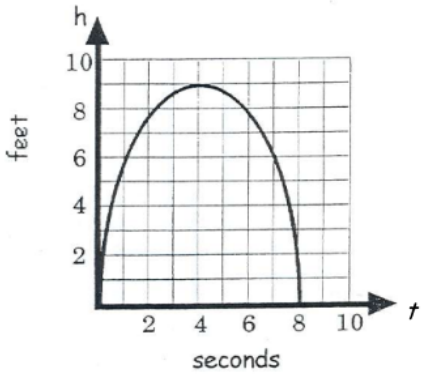
7. Given the function $f(x) = 3x^2 - 5$, what is the value of $f(-2)$?

8. A quadratic function is given below. What is $f(4)$?

$f(x) = -x^2 + 3x - 2$

Algebra I - Unit 9: Topic 1 – Introduction to Quadratic Functions Day 3

9. Mark punted a football. The graph below represents the height, h of the football at time, t.



A. Find $f(1)$. _____

B. Find $f(7)$. _____

C. After how many seconds was the ball at its maximum height? _____

D. What was the maximum height of the ball? _____

E. Fill in the table with four points that lie on the graph.

x				
y				

F. Calculate the quadratic equation. _____
(Round each part of the equation to the nearest tenth.)

10. Calculate the curve of best fit represented by the data in the table below.
(Round each part of the equation to the nearest tenth.)

x	y
-8	-370
-3	-66
-1	-18
4	79
6	-175

HW Help: Quadratics Day 3

NO WORK = NO CREDIT = NO KIDDING!

Need extra help or a calculator? Come to tutorials!

#1-5, JUSTIFY! Draw a picture of the graph, plot points on a sketch, show me the repeated y-value.

#6. Independent variable = x. Look at your table for the corresponding y-values of the listed set.

#7 & 8. Plug in each x-value. Be careful of your parenthesis!

#9. f(x)=y. Make sure you look at the appropriate value!

x	0	1	4	7
y	0	6	9	6

#10. Use STAT (5:QuadReg) since it says CURVE! Round to the first decimal place.