

Quadratics Day 3

Agenda

Warm-Up

HW Check &
Spin

Notes (finish
book)

HW: Practice
#1-10

Reminders

Quiz Friday

Turn in late
HW!!

Essential Question

How do I tell
if a function
is linear or
quadratic?

Warm-Up Monday

1. If $y = -4x^2 + 6$ and $x = 3$, then the value of y is...

$$y = -4(3)^2 + 6$$

$$\boxed{-30}$$

2. Evaluate $f(-3)$ for $f(x) = \cancel{x^2 + 4x - 3}$

$$f(x) = \cancel{4}$$

$$x = -3$$

Questions, Comments, Concerns?

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

Practice – Introduction to Quadratic Functions Day 2

Name _____ Date _____ Period _____

pp 590-611

Graph the following parabolas.



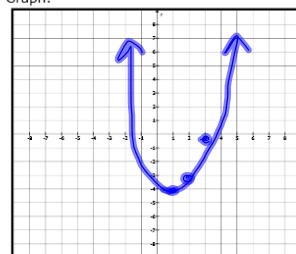
$$f(x) = x^2 - 2x - 3$$

Line of Symmetry: $x=1$
Vertex: $(1, -4)$

Two Values:

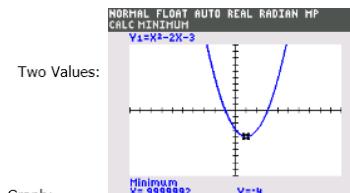
x	y
2	2
3	0

Graph:



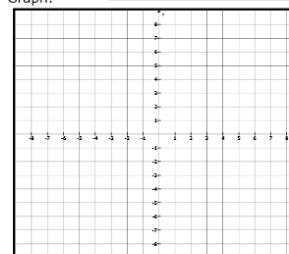
$$2. \quad y = -(x - 3)^2$$

Line of Symmetry: _____
Vertex: _____



Two Values:

Graph:



Find the vertex of the following quadratics.

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

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

~~★ solve for y~~

$$\begin{aligned} 5x^2 - 10x + 3 &= 0 \\ 5x^2 - 10x &= -3 \\ x^2 - 2x &= -\frac{3}{5} \\ x^2 - 2x + 1 &= 1 - \frac{3}{5} \\ (x - 1)^2 &= \frac{2}{5} \\ x - 1 &= \pm \sqrt{\frac{2}{5}} \\ x &= 1 \pm \sqrt{\frac{2}{5}} \end{aligned}$$

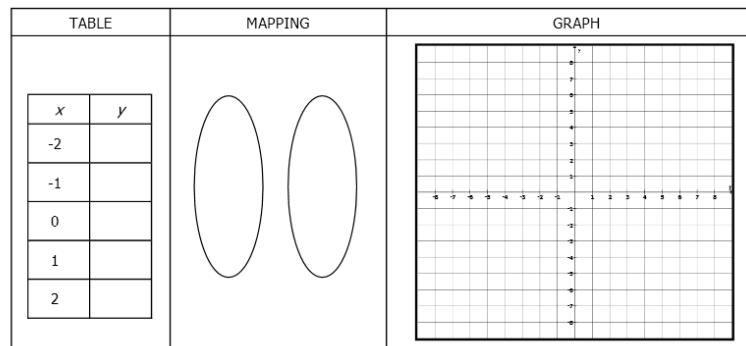
$y = -x^2 + 4x - 7$

$\boxed{(2, -3)}$

~~★~~ 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.

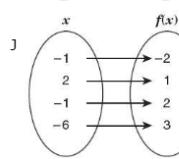
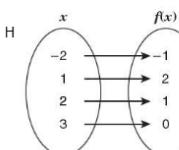
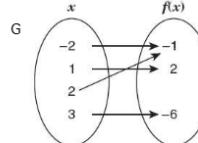
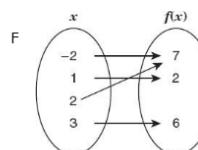
7. $f(x) = x^2 + 4$



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

- A $2x^2 - y = 3x - 2$
- B $y = x^2 + 4x + 16$
- C $y - x^2 + 6 = 9x$
- D $y + 3x^2 = 9$

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



NORMAL FLOAT AUTO REAL RADIAN MP
PRESS Δ FOR Δ Tb1

X	Y ₁
-2	-1
-1	2
0	3
1	2
2	-1
3	-6
4	-13
5	-22
6	-33
7	-46
8	-61

X = -2

HW WHEEL SPIN!!!



LATE HW (anything
not in the tray right
now) will be graded
for ACCURACY.

2nd - FREE

3rd - Selected

Quadratics Day 3 page 5

$y = x$ $y = x^2$
 ↗ Linear VS Quadratic
 ↗ no square (exp) ↗ squared x

From EQUATIONS

1. $y = 3x + 4$
 Linear ↗

2. $f(x) = 5x^2 - 6x + 3$
 Quadratic ↗

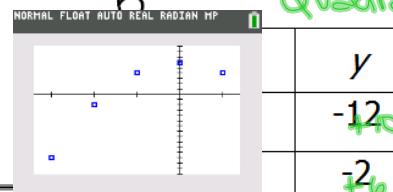
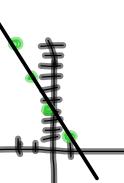
3. $f(x) = 4 - x$
 Linear, no square

4. $y = 7 - 3x^2$
 Quadratic, square

From TABLES/DATA SETS Plot points (sketch graph)

5. Linear

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

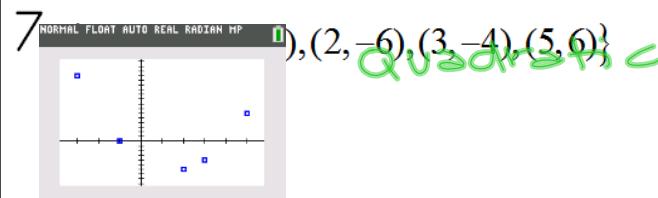


6. Quadratic

x	y
-2	-12
-1	-7
0	4
1	12

y-repeats

x ↗



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

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

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

- Find the equation that best represents the data.

NORMAL FLOAT AUTO REAL RADIAN MP

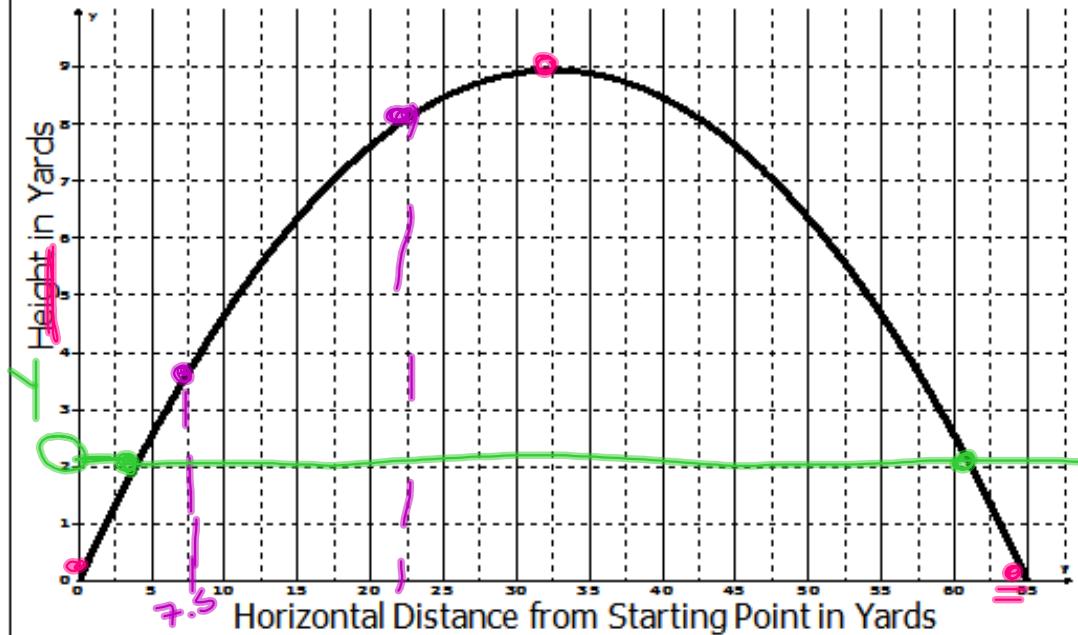
e.

QuadReg	
x	$y = ax^2 + bx + c$
0	a=5.15
17.5	b=33
32.5	c=-7.5
47.5	/
65	0

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: $f(x) = 4$

$$f(x) = 4$$

$$f(7.5) = 3.5$$

$$x = 7.5$$

$$f(x) = 4$$

$$f(22.5) = 8$$

$$x = 22.5$$

$$f(x) = 4$$

$$x = 62$$

$$3 \cancel{4}$$

When $f(x) = 2$, find the value of x .

What is the maximum height of the ball?

4 yards

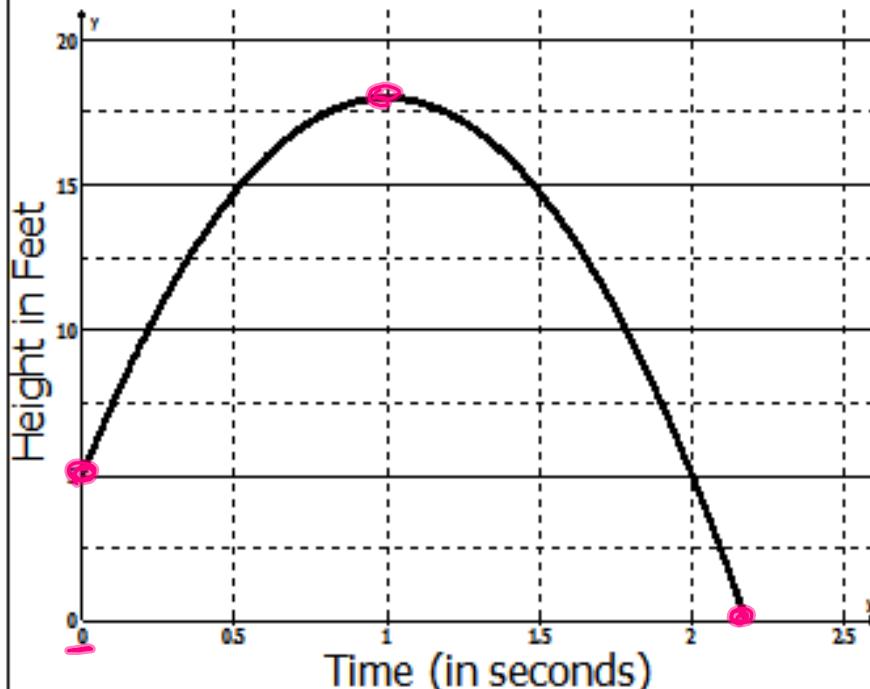
Where does the ball touch the ground?

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 $h(0.5) =$

Find $h(2) =$

Approximately when
is the ball 5 feet in
the air?

How high did the ball
go in the air?

Domain : $0 \leq x \leq 2.3$

Range: $0 \leq y \leq 18$

Page 6

Quadratics Day 3 page 7 (back)

Evaluating Quadratic Functions

LABEL, plug in values

dependent \rightarrow Y
independent \rightarrow X

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

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

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

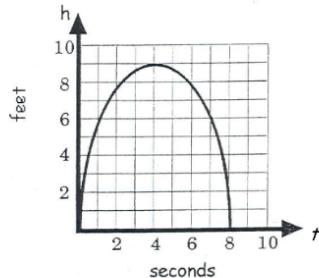
6. A function is described by the equation $f(x) = x^2 - 3$. The replacement set for the independent variable is $\{-4, -1, 2, 4\}$. Which of the following is contained in the corresponding set for the dependent variable?

- 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 39. 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.

