

Name: *Keyz*

Date:

Hour:

Algebra 1
PC #1 Review WS – Unit 7

For the functions below:

- Does it open up or down?
- What is the axis of symmetry?
- What is the vertex?
- What is the domain and range?
- Does it have a minimum or maximum value? What is the value?
- Graph the function.

1. $f(x) = 4x^2 + 8x - 1$

a) up

b) $x = \frac{-8}{2(4)} = \frac{-8}{8} = -1$

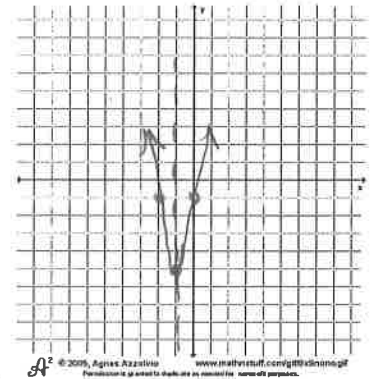
$x = -1$

c) $4(-1)^2 + 8(-1) - 1$
 $(-1, -5)$

d) $D: \{x \in \mathbb{R}\}$
 $R: \{y \geq -5\}$

e) min = -5

y-int $\rightarrow (0, -1)$



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

a) up

b) $x = \frac{-(-2)}{2(4)} = \frac{2}{8} = \frac{1}{4}$

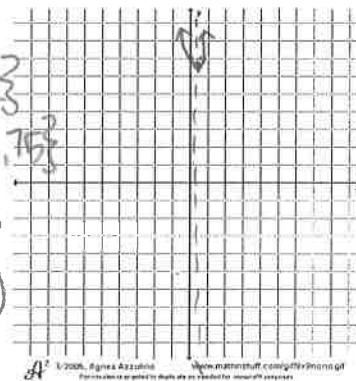
$x = \frac{1}{4}$

c) $4(\frac{1}{4})^2 - 2(\frac{1}{4}) + 7$
 $(\frac{1}{4}, 6.75)$

d) $D: \{x \in \mathbb{R}\}$
 $R: \{y \geq 6.75\}$

e) min = 6.75

y-int $\Rightarrow (0, 7)$



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

a) down

b) $x = \frac{-3}{2(-3)} = \frac{-3}{-6} = \frac{1}{2}$

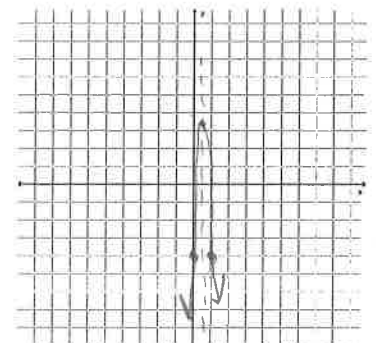
$x = \frac{1}{2}$

c) $-3(\frac{1}{2})^2 + 3(\frac{1}{2}) - 4$
 $(\frac{1}{2}, -3.25)$

d) $D: \{x \in \mathbb{R}\}$
 $R: \{y \leq 3.25\}$

e) max = 3.25

y-int $\rightarrow (0, -4)$



4. $f(x) = \frac{1}{2}x^2 - 6x + 10$

a) up

b) $x = \frac{-(-6)}{2(\frac{1}{2})} = \frac{6}{1} = 6$

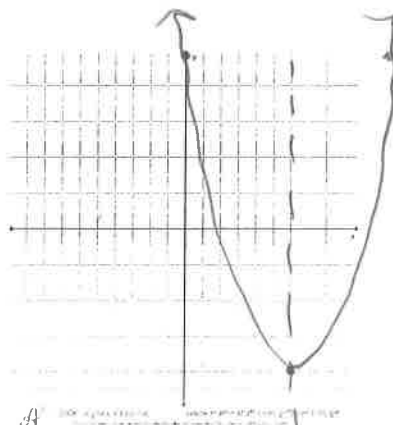
$x = 6$

c) $\frac{1}{2}(6)^2 - 6(6) + 10$
 $(6, -8)$

d) $D: \{x \in \mathbb{R}\}$
 $R: \{y \geq -8\}$

e) min = -8

y-int $\rightarrow (0, 10)$



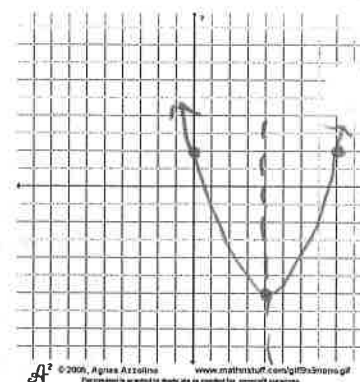
Graph each function.

5. $f(x) = \frac{1}{2}(x - 4)^2 - 6$

vertex $(4, -6)$

$\frac{1}{2}(0-4)^2 - 6$

y-int $(0, 2)$

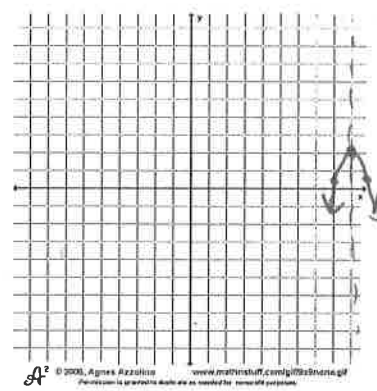


6. $f(x) = -\frac{4}{3}(x - 9)^2 + 2$

vertex $(9, 2)$

y-int $-\frac{4}{3}(0-9)^2 + 2$

$x \mid y$	$(0, -106)$	cant graph
$\frac{8}{9} \mid 2$	$-\frac{4}{3}(8-9)^2 + 2$	
	$(8, 2/3)$	



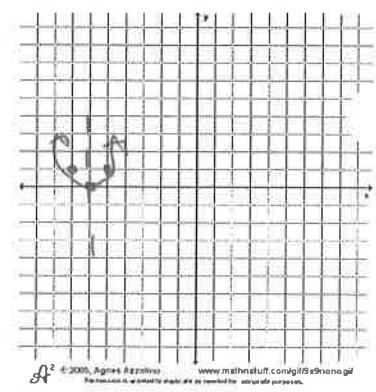
7. $f(x) = (x + 6)^2$

vertex $(-6, 0)$

y-int $(0+6)^2$

$(0, 36)$
cant graph

$x \mid y$	$(-5+6)^2$
$-5 \mid 1$	
$-6 \mid 0$	



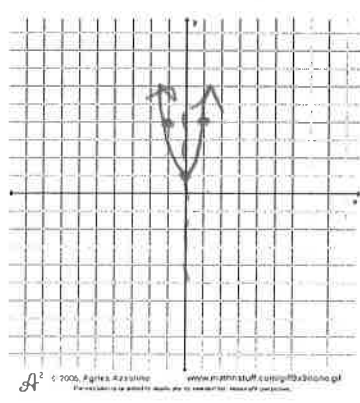
8. $f(x) = 3x^2 + 1$

$3(x-0)^2 + 1$

vertex $(0, 1)$

y-int \nearrow

$x \mid y$	$3(-1)^2 + 1$
$-1 \mid 4$	
$0 \mid 1$	



Write a quadratic function in vertex form whose graph has the given vertex and passes through the given point.

9. Vertex at (5, -2) and passes through (7, 0)

$$y = a(x-5)^2 - 2$$

$$0 = a(7-5)^2 - 2$$

$$0 = a(2)^2 - 2$$

$$\begin{array}{r} +2 \\ \hline 2 = 4a \\ a = \frac{1}{2} \end{array}$$

$$y = \frac{1}{2}(x-5)^2 - 2$$

10. Vertex at (-5, -1) and passes through (-2, 2)

$$y = a(x+5)^2 - 1$$

$$2 = a(-2+5)^2 - 1$$

$$2 = a(3)^2 - 1$$

$$\begin{array}{r} +1 \\ \hline 3 = 9a \\ a = \frac{1}{3} \end{array}$$

$$y = \frac{1}{3}(x+5)^2 - 1$$

11. Vertex at (3, 2) and passes through (4, 7)

$$y = a(x-3)^2 + 2$$

$$7 = a(4-3)^2 + 2$$

$$\begin{array}{r} -2 \\ \hline 5 = a(1)^2 \\ a = 5 \end{array}$$

$$y = 5(x-3)^2 + 2$$

Describe each transformation.

12. $f(x) = -\frac{4}{3}(x-9)^2 + 2$

Open down, stretch, vertex (9, 2)

13. $f(x) = 5(x+2)^2 - 11$

Open up, stretch, vertex (-2, -11)

Write a quadratic function that represents the transformation below.

14. Opens down, stretched by a factor of your choice, moves right 7 and down 8

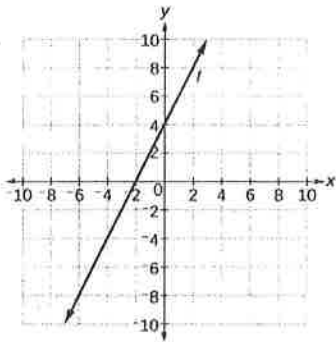
$$f(x) = -4(x-7)^2 - 8$$

15. Compressed by a factor of your choice, moves up 10 and left 18, opens up

$$f(x) = \frac{1}{2}(x+18)^2 + 10$$

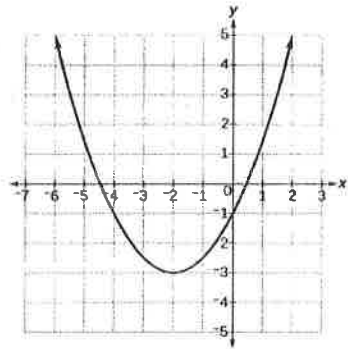
Determine if each example is a quadratic function. Explain why or why not.

16.



Linear, line

17.



quadratic, parabola

18.

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

+1 (between x=-3 and -2)
 +1 (between x=-2 and -1)
 +1 (between x=-1 and 0)
 +1 (between x=0 and 1)
 +1 (between x=1 and 2)
 +1 (between x=2 and 3)
 +1 (between x=3 and 4)

-6 +2
 -4 +2
 -2 +2
 +0 +2
 +2 +2
 +4 +2
 +6 +2

quadratic,
2nd level constant

19.

x	y
0	3
2	11
4	19
6	27
8	35

+2 (between y=3 and 11)
 +2 (between y=11 and 19)
 +2 (between y=19 and 27)
 +2 (between y=27 and 35)

+8
 +8
 +8
 +8

linear,
1st level constant