

PC #1 Review WS Unit 7

Date _____

Period _____

Answer each question below, then graph the function.

- Does it open up or down?
- What is the axis of symmetry?
- What is the vertex?
- What is the y-intercept (ordered pair)?
- Is there a max or min? What is this value?

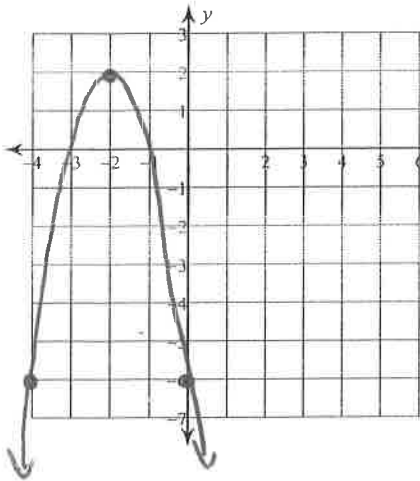
1) $y = -2x^2 - 8x - 6$

a.o.s: $x = \frac{-b}{2a} = \frac{8}{2(-2)}$

$$\frac{8}{-4} = -2$$

$$y = -2(-2)^2 - 8(-2) - 6$$

$$x = -8 + 16 - 6 = 2$$

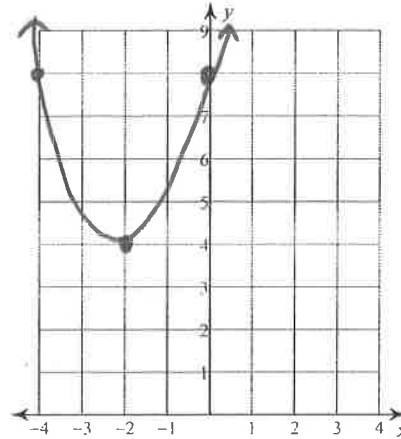
Vertex $(-2, 2)$ y-int: $(0, -6)$ Max: $y = 2$ 

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

a.o.s: $x = \frac{-b}{2a} = \frac{-4}{2(1)} = -2$

$$y = (-2)^2 + 4(-2) + 8$$

$$4 - 8 + 8 = 4$$

Vertex $(-2, 4)$ 

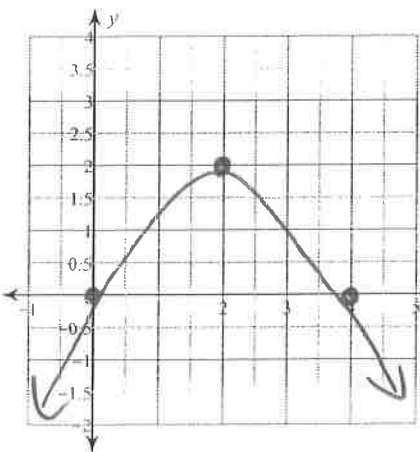
3) $y = -\frac{1}{2}x^2 + 2x$

a.o.s: $x = \frac{-b}{2a}$

$$= \frac{-2}{2(-\frac{1}{2})} = 2$$

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

$$-2 + 4 = 2$$

Vertex $(2, 2)$ y-int: $(0, 0)$ 

4) $y = 2x^2 - 6$

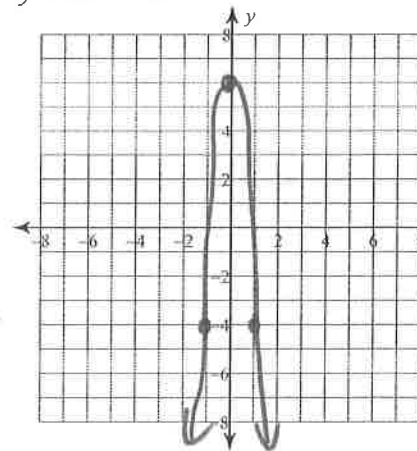
a.o.s: $x = \frac{-b}{2a}$

$$= \frac{0}{2(2)} = 0$$

$$y = 2(0)^2 - 6$$

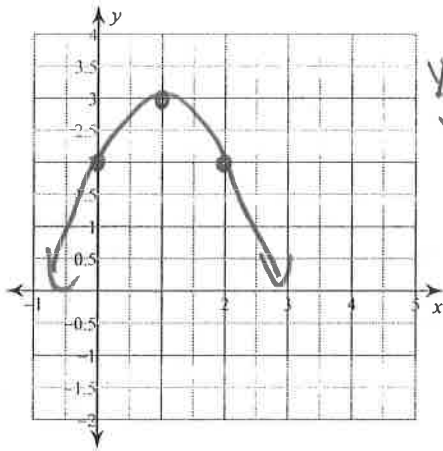
Vertex $(0, -6)$ y-int: $(0, -6)$ * Choose $x = 1$

$$y = 2(1)^2 - 6 = -4$$

 $(1, -4)$ 

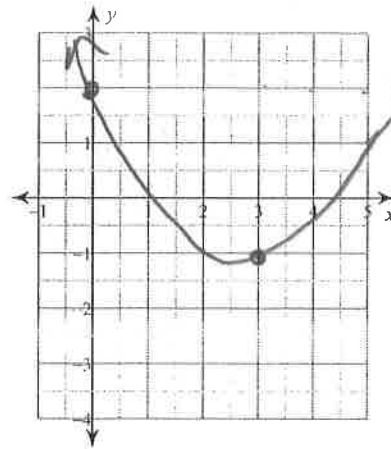
Sketch the graph of each function.

5) $y = -(x-1)^2 + 3$



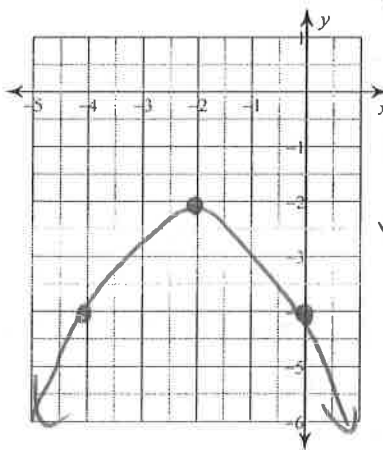
Vertex (1, 3)
 $y\text{-int (x=0)}$
 $y = -(0-1)^2 + 3$
 $-1 + 3 = 2$
 (0, 2)

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



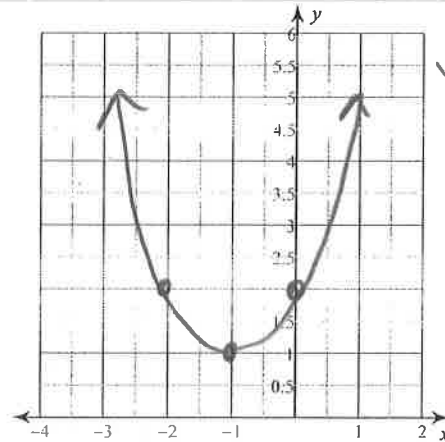
Vertex (3, -1)
 $y\text{-int (x=0)}$
 $y = \frac{1}{3}(0-3)^2 - 1$
 $= \frac{1}{3}(9) - 1 = 2$
 (0, 2)

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



Vertex (-2, -2)
 $y\text{-int (x=0)}$
 $y = -\frac{1}{2}(0+2)^2 - 2$
 $y = -\frac{1}{2}(4) - 2$
 $= -2 - 2 = -4$
 (0, -4)

8) $y = (x+1)^2 + 1$



Vertex (-1, 1)
 $y\text{-int (x=0)}$
 $y = (0+1)^2 + 1$
 $y = 1 + 1 = 2$
 (0, 2)

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

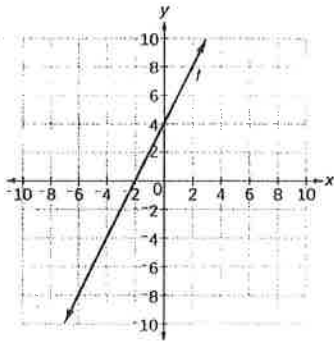
$$f(x) = -4(x-7)^2 - 8$$

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

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

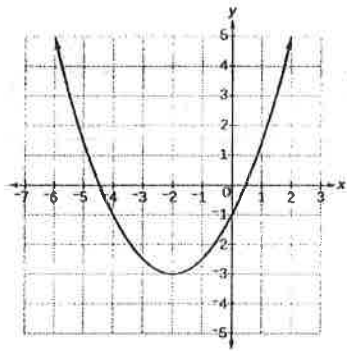
Determine if each example is a quadratic function. Explain why or why not.

16.



Linear, line

17.



quadratic, parabola

18.

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

quadratic,
2nd level constant

19.

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

linear,
1st level constant