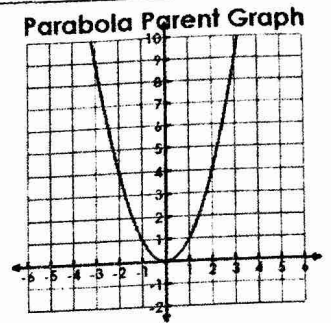


Name: _____ Date: _____

Transformations of Vertex Form

$$f(x) = a(x-h)^2 + k$$



What does a do?

- reflect across the x-axis. (-a)

- vertical stretch ($a > 1$)
- vertical shrink ($0 < a < 1$)

What does h do?

- moves left (+h)
- moves right (-h)

What does k do?

- moves up (+k)

- moves down (-k)

Determine what transformations are applied in the following functions.

1. $f(x) = (x-3)^2 + 5$
 right 3
 up 5

2. $f(x) = -(x-2)^2 + 7$
 - Reflect up 7
 - right 2

3. $f(x) = \frac{1}{3}(x+3)^2 - 2$
 • shrink by $\frac{1}{3}$
 • left 3
 • down 2

4. $f(x) = 4(x-3)^2 + 8$
 • stretch 4
 • right 3
 • up 8

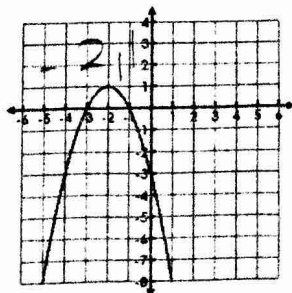
Vertex: (h, k)

Axis of Symmetry: $x = h$

Given the graph of the quadratic, find a , h , & k . Then write the equation in vertex form.

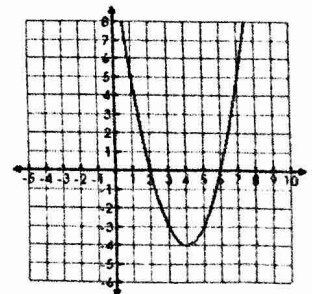
5.

- $a = -$
- $h = -2$
- $k = 1$
- $f(x) = -(x+2)^2 + 1$



6.

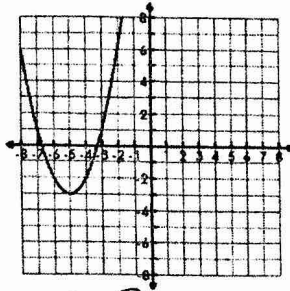
- $a = +$
- $h = 4$
- $k = -4$
- $f(x) = (x-4)^2 - 4$



-3, 2

7.

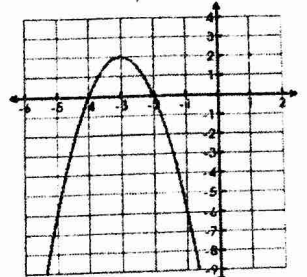
- $a = 1$
- $h = -5$
- $k = -2$



• $f(x) = (x + 5)^2 - 2$

8.

- $a = -2$
- $h = -3$
- $k = 2$



• $f(x) = -2(x + 3)^2 + 2$

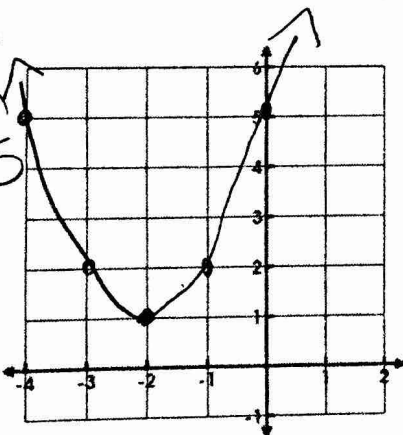
Steps to Graphing in VERTEX form:

- Find the vertex. Plot it.
- Find the axis of symmetry. Graph this lightly as a dashed vertical line.
- On your calculator: TABLE, EDIT FUCTION, ENTER, START = <enter your h-value>, CALC, ENTER. Scroll up and down to get other ordered pairs.
- Connect in a u-shape with arrows at each end.

Graph & identify the vertex and axis of symmetry.

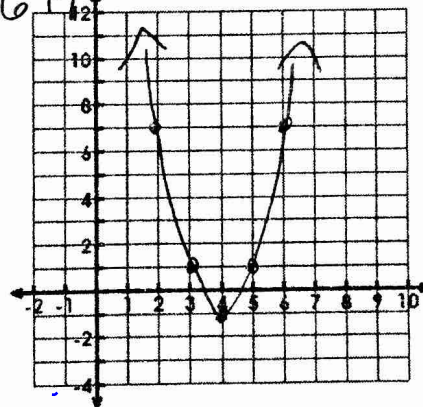
9. $f(x) = (x + 2)^2 + 1$

x	y
-2	1
-3	2
-4	5

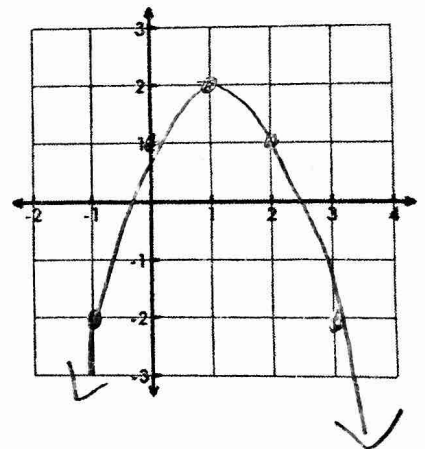


10. $f(x) = 2(x - 4)^2 - 1$

x	y
4	-1
5	7
6	17

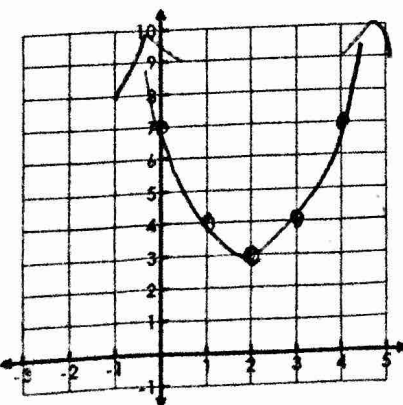


11. $f(x) = -(x - 1)^2 + 2$



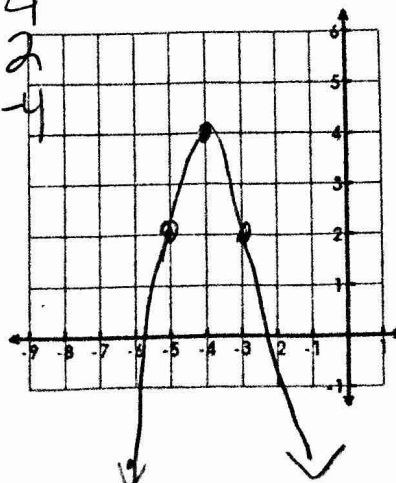
12. $f(x) = (x - 2)^2 + 3$

x	y
2	3
3	4
4	7



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

x	y
-4	4
-5	2
-6	-4



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

x	y
-3	-3
-4	-4
-5	-7

