Friday / Monday

Hey

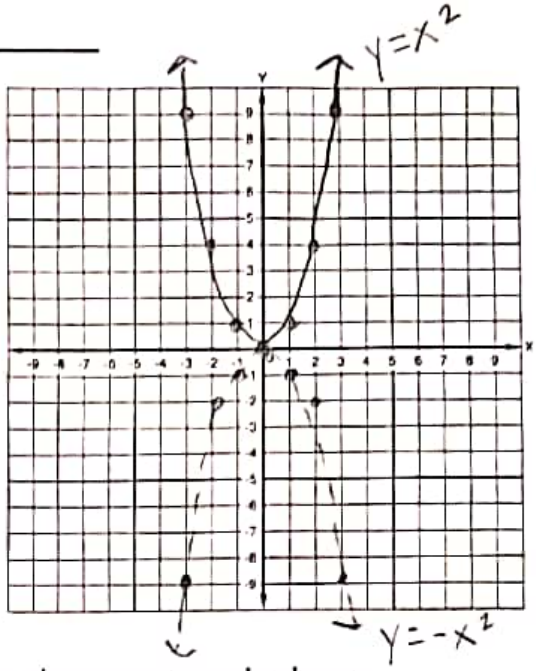
4.1 Notes

Graphing in Vertex Form

Parent function for quadratics: $y = x^2$

Complete the table and graph the parent function.

x	f(x)
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



Use your same table and graph $f(x) = -x^2$ on the same graph above.

Vertex form for a quadratic: $y = a(x-h)^2 + k$

NOT slope → "a" determines the direction + width of the opening

"h" represents a horizontal shift (-h → +h ←)

"k" represents a vertical shift (+k ↑ -k ↓)

The point (h, k) is the vertex

To graph a quadratic in vertex form:

1. Determine the vertex and graph it.
2. Decide if the graph opens up or down.
3. Use a to determine how wide/narrow your parabola will be.
4. Plot at least 2 points on either side of your vertex. Connect with a curve.
   * 1 and mirror!

Example: Graph $f(x) = (x-4)^2 - 2$

a= 1

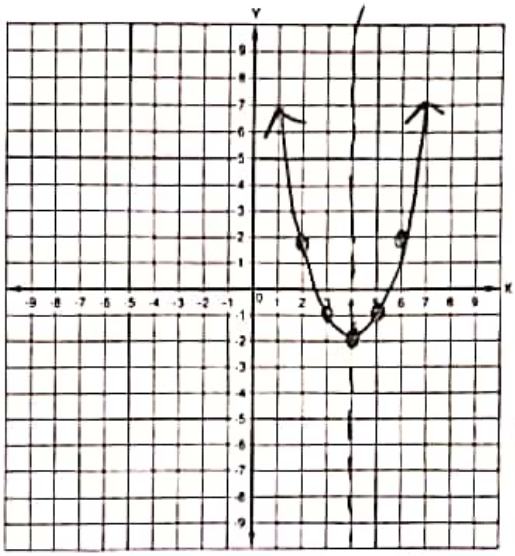
h= 4

k= -2

Will your parabola open up or down? up

Vertex: (4, -2)

Is the vertex a max point or min point? min



X	Y
2	2
6	2

$(2-4)^2-2$
$(-2)^2-2$
$4-2$
$=2$

Example: Graph $f(x) = -2(x+1)^2$

a= -2

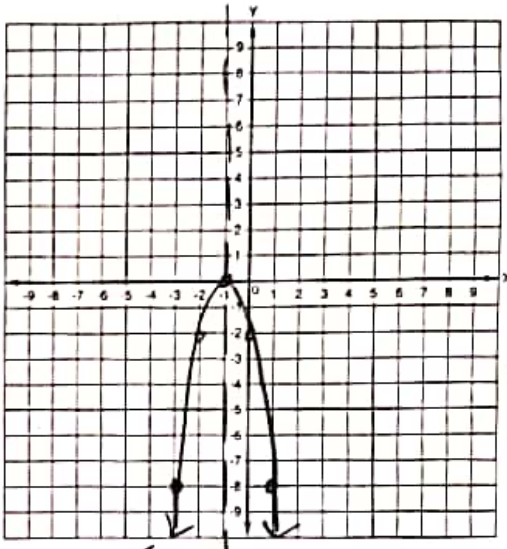
h= -1

k= 0

Will your parabola open up or down? down

Vertex: (-1, 0)

Is the vertex a max point or a min point? max



X	Y
-3	-8

$-2(-3+1)^2$
$-2(-2)^2$
$-2(4)$

Example: Graph $f(x) = 3(x+2)^2 + 2$

a= 3

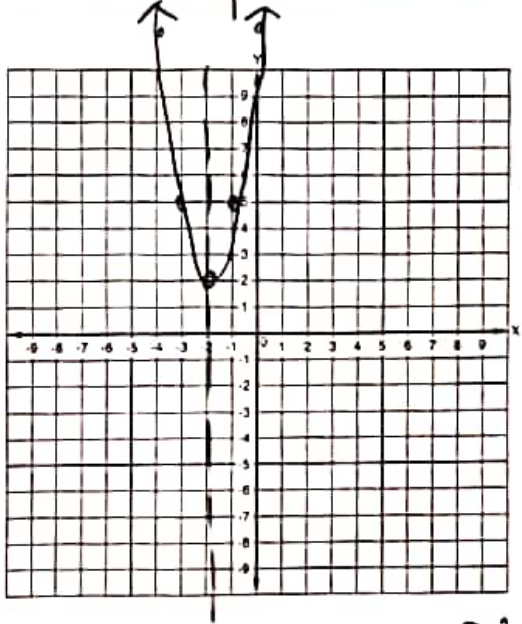
h= -2

k= 2

Will your parabola open up or down? up

Vertex: (-2, 2)

Is the vertex a max or a min?



X	Y
-1	5
0	14

$3(-1+2)^2+2$
$3(1)^2+2$
5