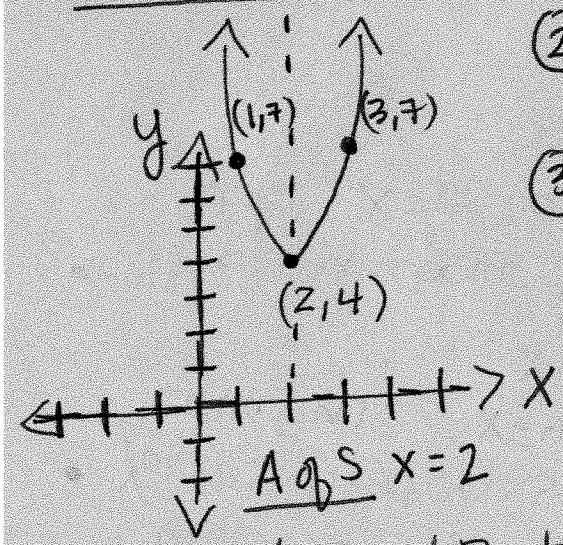
Example: $f(x) = 3(x-2)^2 + 4$

$a = 3 \Rightarrow$ opens up, stretched

$h = 2$, $k = 4$ } Vertex: $(2, 4)$

- Remember h is always opposite of what it looks like in the equation.
- Parabola opens < up when $a > 0$ (positive); down when $a < 0$ (negative)
- Vertex: (h, k)

Sketch Graph



1. Plot the vertex.
2. Plug in a value of x, plot.
3. Plot mirror point.

Table

x	f(x)	
0	16	→ y-int
1	7	
2	4	Vertex (min)
3	7	
4	16	

Solutions / Zeros / Roots / X-Intercepts: None

Graph does not cross the x-axis and no values of $f(x) = 0$ in the table.

Vertex Form: $f(x) = a(x-h)^2 + k$, $a \neq 0$

Intercept / Factored Form: $f(x) = a(x-p)(x-q)$, $a \neq 0$

Standard Form: $f(x) = ax^2 + bx + c$, $a \neq 0$