

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

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

How to sketch the graph:

- Read off the number a and the vertex (h, k) :
 $a = 2$ and vertex is $(3, 1)$

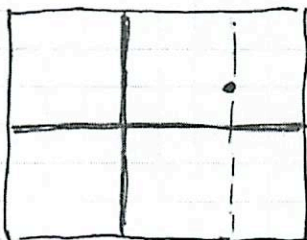
$$y = a(x-h)^2 + k$$

$$\downarrow \quad \uparrow \quad \uparrow \quad \uparrow$$

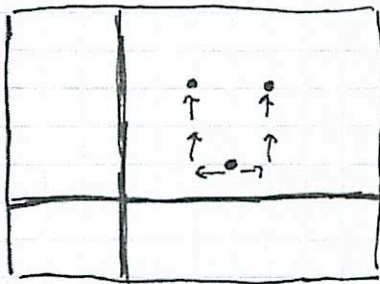
$$y = 2(x-3)^2 + 1$$

$$a=2 \quad h=3 \quad k=1$$

- Plot the vertex:

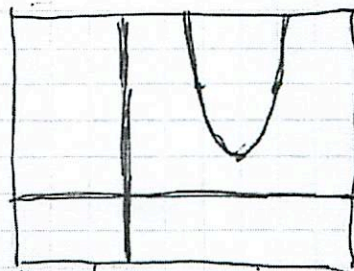
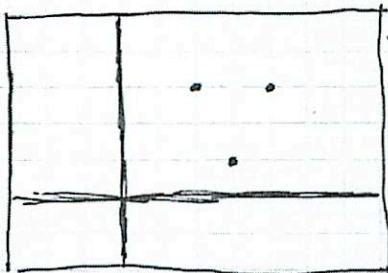


- It may help to draw the axis of symmetry (a vertical line through the vertex) very lightly (in pencil maybe)
- Plot two more points as follows: start at the vertex, then
 - move one unit to the right and a units up (if a is negative go down)
 - move one unit to the left and a units up



here $a = 2$ so we move
one unit right/left
and two units up

Now we have these three points:



- Sketch the parabola through these points, keeping it smooth and symmetric about its axis.