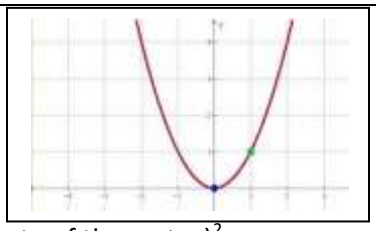
Shifted parabolas. Name_____ Date _____

The standard parabola is $y=x^2$. Everyone knows that the graph of this parabola looks like this (see picture to the right):



Its VERTEX is the point (0,0). The VERTEX is the lowest point on this parabola.
Using FUNCTION SHIFTING, we can move this parabola on the x-y plane as follows: $(y-k) = (x-h)^2$ has the SAME SHAPE AND SIZE as the standard parabola $y=x^2$; however the VERTEX of the new parabola is the point (h,k). Notice: (y MINUS y-coordinate of vertex) = (x MINUS x-coordinate of the vertex)$^2$

Using the technique of FUNCTION SHIFTING, for each problem below, find the vertex. Then show the graph of the function.

| | Problem | Work | Table of values | Vertex | Graph |
|---|---|---|---|---|---|
| 1 | (example problem) $y-3 = (x-2)^2$ | y-shift is 3. x-shift is 2. | x: 0, 2, 4 / y: 7, 3, 7 | V = (2,3) | |
| 2 | $y-3 = (x-1)^2$ | | x / y | | |
| 3 | $y+2 = (x)^2$ | | x / y | | |
| 4 | $y+2 = (x+2)^2$ | | x / y | | |
| 5 | $y-1 = (x+1)^2$ | | x / y | | |
| 6 | $y+1 = (x-4)^2$ | | x / y | | |
| 7 | $y-0.5 = (x+2.5)^2$ | | x / y | | |
| 8 | $y+4 = (x+1)^2$ | | x / y | | |