

Graph Quadratics in Vertex Form

Vertex Form:

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

1. Note if the **graph opens up or down**: opens up if $a > 0$ and opens down if $a < 0$
2. Find/graph the vertex: The **vertex** will be the point (h, k) ****THE "h" VALUE FOR THE VERTEX WILL HAVE THE OPPOSITE SIGN OF THE "h" VALUE IN THE QUADRATIC. THE SIGN FOR THE "k" VALUE WILL STAY THE SAME******
3. Find/draw (dotted line) the **axis of symmetry** $\rightarrow$ h value of the quadratic $x = h$
4. Find **two additional points, plot them, and plot their reflected points**
 - Choose two "x" values, plug them into the expression, and solve for "y" – this will give you a point to plot (x, y)
 - Easiest to choose 2 values that are LESS THAN the x coordinate of the vertex, and then reflect those points
 - Can make a chart to visualize this best

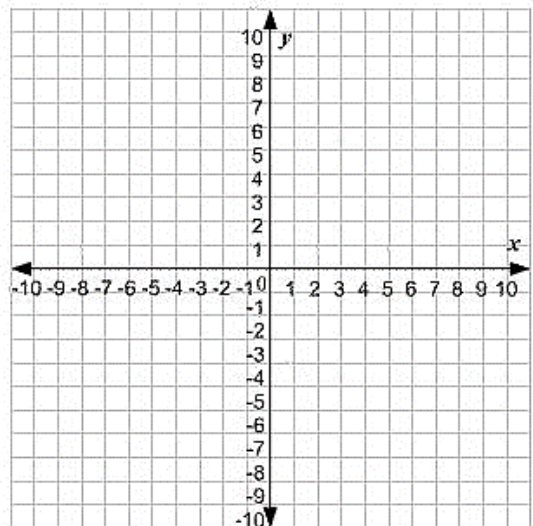
x	y

5. **Connect the points to create a parabola!**

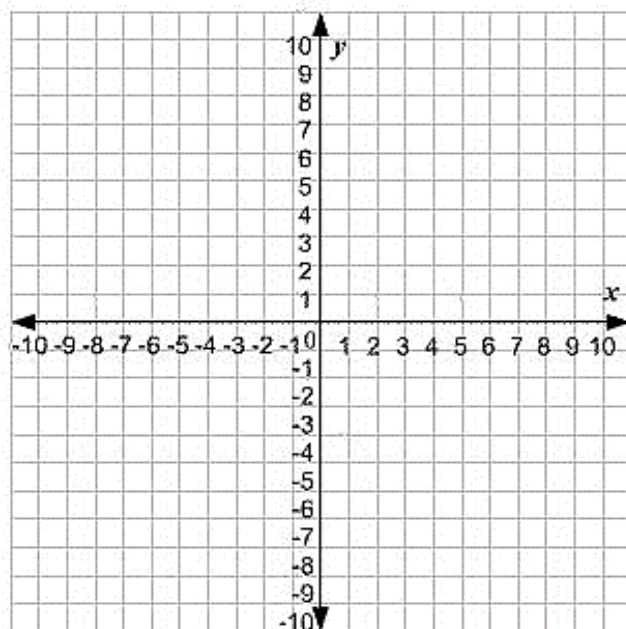
**** You can check if your parabola has opened correctly (up or down) based on whether or not the "a" value is positive (opens up) or negative (opens down)****

Examples:

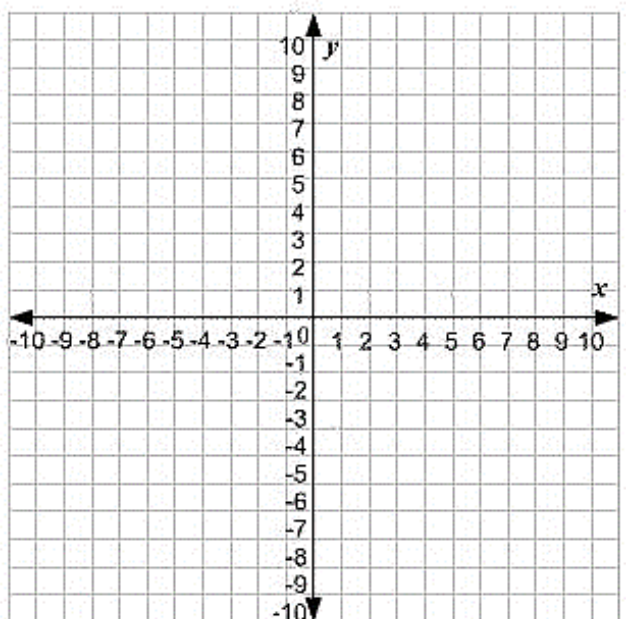
1) Graph $y = 2(x - 2)^2 + 1$



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



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



4) Graph $y = \frac{1}{2}(x + 2)^2 - 3$

