AChor/MBF3C **Name:** _____

Date: _____

Worksheet 4-7: Graphing Quadratic Relations $y = a(x-h)^2 + k$

Method 1: Graphing by Transformation

Step 1 - Plot the vertex (***Draw your transformed x- and y- axes from the vertex!)***

Step 2 - Determine the opening direction of the parabola (upward if $a > 0$; downward if $a < 0$)

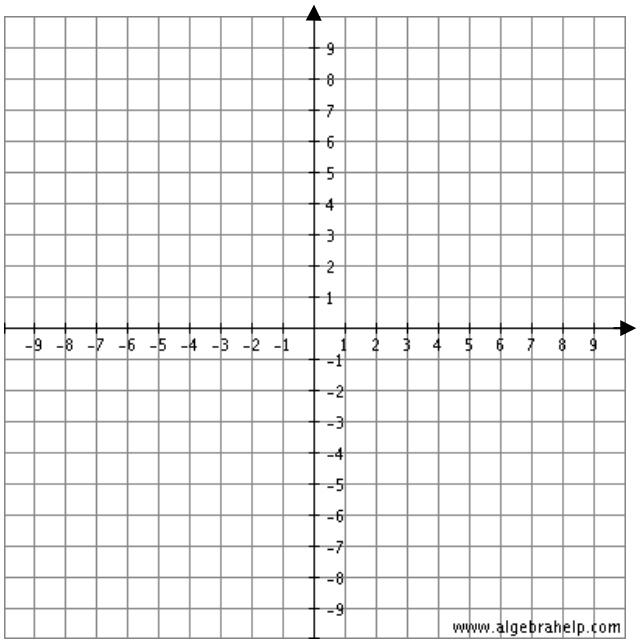
Step 3 - From the vertex, graph the next four points (***assuming vertex is the origin***):

- If $a > 0$, graph next four points $(1,\ 1\times a)$, $(-1,\ 1\times a)$, $(2,\ 4\times a)$, and $(-2,\ 4\times a)$
- If $a < 0$, graph next four points $(1,\ -1\times a)$, $(-1,\ -1\times a)$, $(2,\ -4\times a)$, and $(-2,\ -4\times a)$

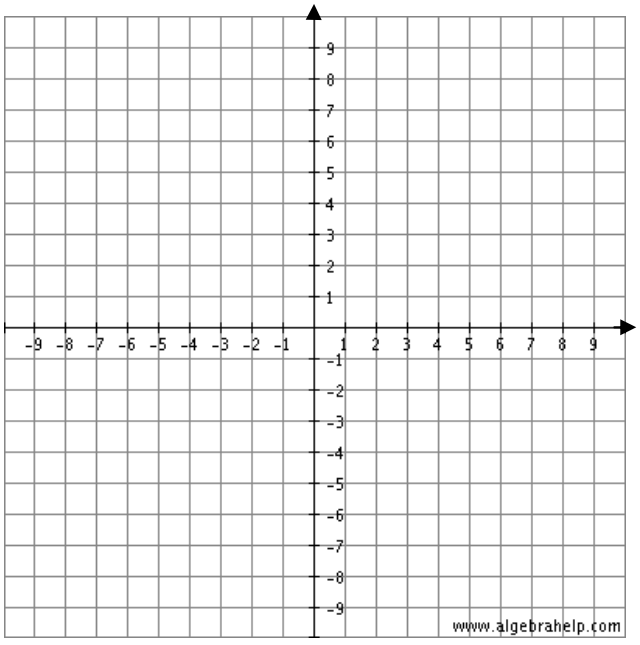
Step 4 - Connect all points with a smooth curve and put arrows at both end of the parabola

Step 5 - Label the parabola and the axes

1. $y = 3(x+4)^2 - 9$

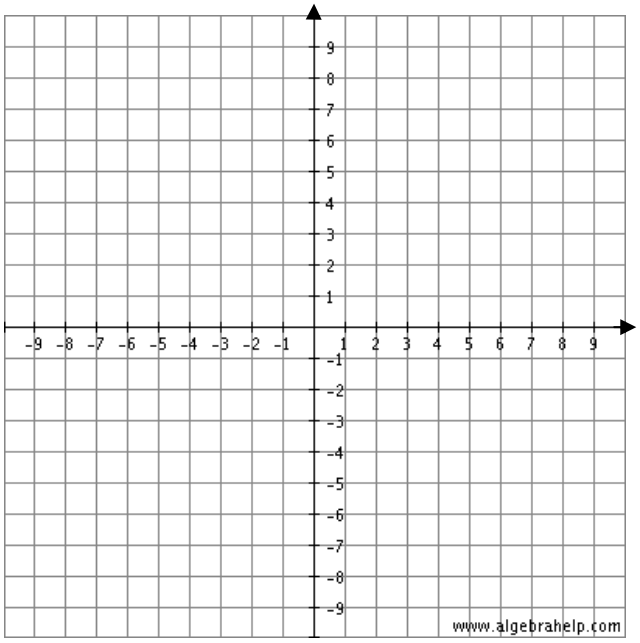


2. $y = -\frac{1}{4}(x-1)^2 + 7$

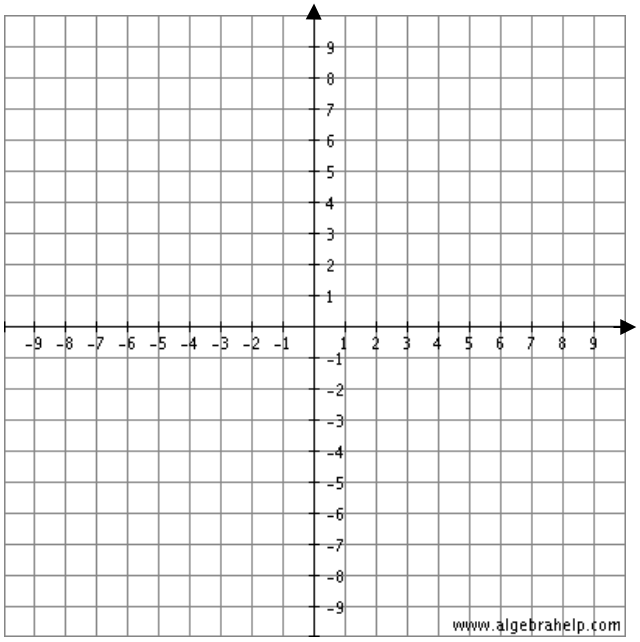


Check out assigned work on next page.

3. $y = \frac{1}{3}(x+5)^2 + 1$



4. $y = -2(x-3)^2 - 1$



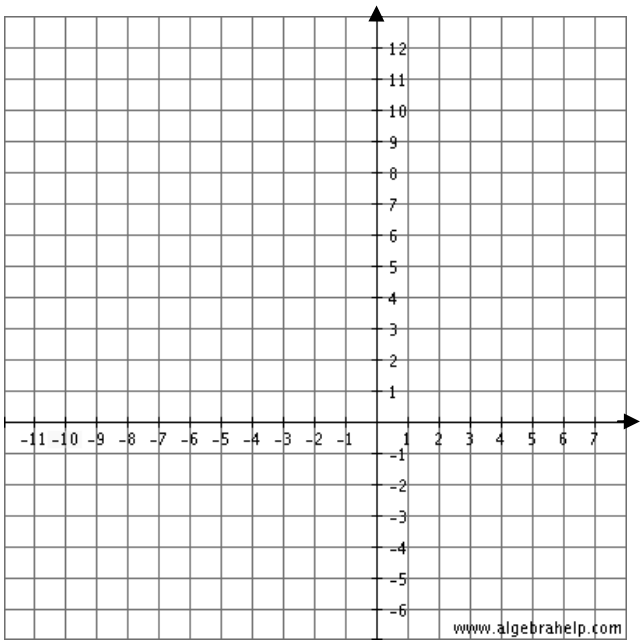
Assigned Work: WS 4-7; p. 212 #2 (e to j), #3 (a to f), #9

Method 2: Graphing Using Vertex and Two Points

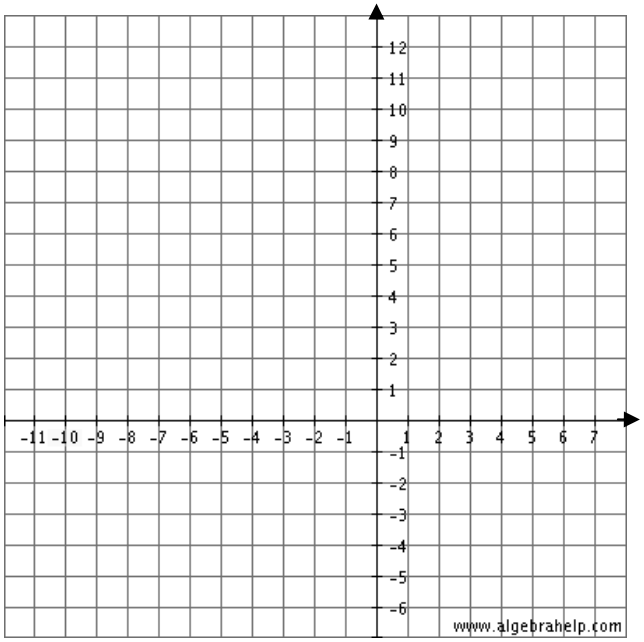
Step 1 - Identify the coordinates of the vertex
Step 2 - Determine the *x*-coordinates of two other points
- 2 units to the **left** of the vertex, and 2 units to the **right** of the vertex

Step 3 - Substitute the *x*-values from step 2 into $y = a(x-h)^2 + k$ to find two points on the parabola
Step 4 - Plot the two points and the vertex on the same set of axes
Step 5 - Connect the points with a smooth curve and put arrows at both end of the parabola
Step 6 - Label the parabola and the axes

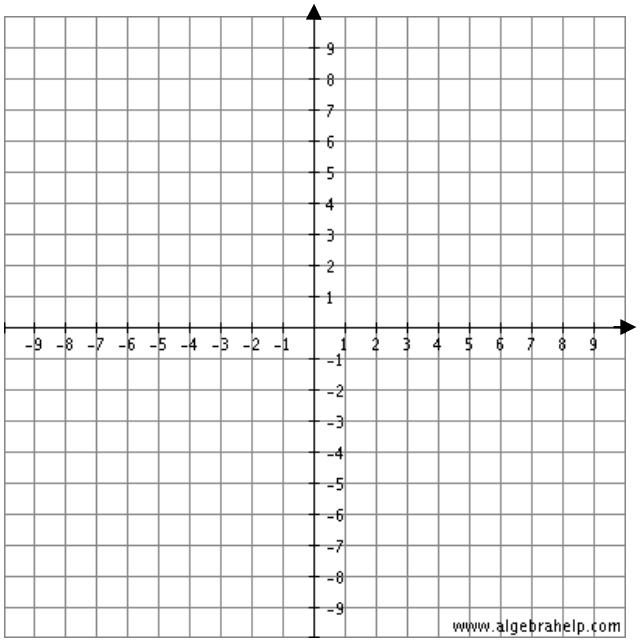
5. $y = 2(x-6)^2 + 3$



6. $y = -0.5(x+9)^2 - 2$



7. $y = -(x+2)^2 - 1$



8. $y = 0.25(x+1)^2 - 5$