

5.2 TRANSLATING PARABOLAS**Learning Targets**

1. Recognize and graph quadratic functions of the form $y = a(x-h)^2 + k$
2. Solve a quadratic equation of the form $a(x-h)^2 + k = 0$
3. Write the equation of a quadratic function of the form $y = a(x-h)^2 + k$ when given a point on the graph.

Example 1: Try graphing the following parabolas on your calculator. Describe how each is different than $y = x^2$

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

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

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

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

If a quadratic equation is in the form $y = a(x-h)^2 + k \dots$

The vertex is at _____. (The vertex is the highest ... or lowest ... point of the parabola)

If _____, then the parabola opens UP.

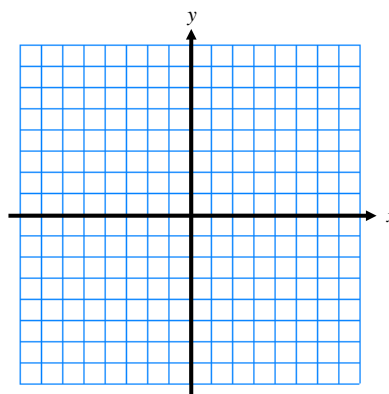
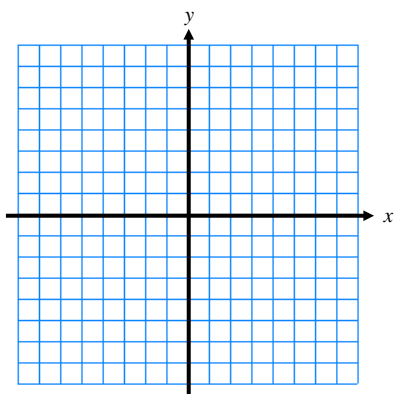
If _____, then the parabola opens DOWN.

The bigger the a value gets (in absolute value) the _____ the graph gets.
(You find the other points on the parabola like you did last time)

Example 2: Graph the following quadratic equations.

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

b) $y = -3(x-2)^2 + 7$



Example 3: Solve the following quadratic equations.

a) $(x-2)^2 + 8 = 17$

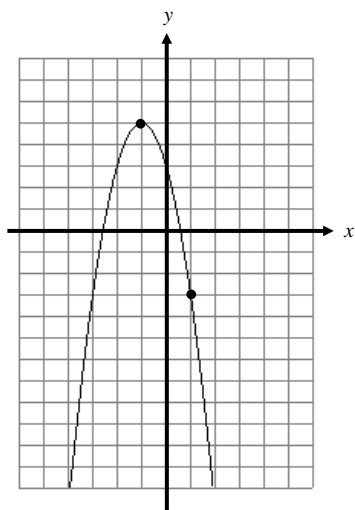
b) $2(x+3)^2 - 5 = 13$

c) $-4(x-8)^2 + 1 = -7$

d) $9 - \frac{2}{3}(x+1)^2 = 2$

Example 4: Write each of the graphs below in the form $y = a(x-h)^2 + k$.

a)



b)

