Algebra 2 Lesson 5-3: Transforming Parabolas Mrs. Snow, Instructor

Parent function: $y = x^2$
Vertex form – $y = a(x - h)^2 + k$
Vertex: (<i>h</i> , <i>k</i>)

Just as our other functions, the x-element of the vertex translates the parabola horizontally left or right. The y-element translates the parabola vertically up or down.

Note: While we like to graph using the calculator, using the vertex form in some cases may even be faster than using a graphing calculator.



When	$y = x^2$	or $y = a(x - x)$	$(h)^2 + k$:
1.	$y = -ax^2$		reflection across the x-axis (flips upside down) Negative is a sad face.
2.	a>1		the graph stretches (gets skinny)
3.	0 <a<1 (a fraction)</a<1 		the graph will shrink (gets broad or wide)
4.	h>0 or h<0	remember the equation form $(x - \sum_{h=1}^{n} h \ge 1)^2$	positive h shift right →→ negative h graph shifts left ◆→→
5.	k>0 or k<0		positive k shift up negative k shift down or
6.	vertex= (h,k)		
7.	axis of symme	try: line x=h	





Translation:

Graph:
$$f(x) = (x - 2)^2 + 3$$

The vertex is:
Notice that the graph has both a vertical and a horizontal shift. The graph moves _____2 units and _____3 units.
Reflection:
Graph: $g(x) = -(x - 2)^2 + 3$?
The vertex is:
This is called a **reflection** along the horizontal axis. We can generalize by saying that any quadratic equation with a negative sign in front of the x² term will open downward or be upside down.

Leading Coefficient:

Graph $y = 3x^2$

Notice the effect of a number in front of a quadratic equation: the graph got skinnier (compressed).

Graph $y = \frac{1}{4}x^2$,

The graph gets fatter (stretches).

In general, if the constant, "a", is larger than 1 the graph will get skinny.

For values between 0 and 1 the graph will get wider.



Write an equation of a parabola in vertex form from a graph

