Lesson Plan

Grade 10 Academic Math **Lesson: 5 - 3**

Unit: Transformations of Quadratic **Topic: Multiple Quadratic Transformations**

- ***homework check:*** **Principles of Mathematics 10 p. 262 # 1 – 5**

- ***note:*** **Multiple Quadratic Transformations**

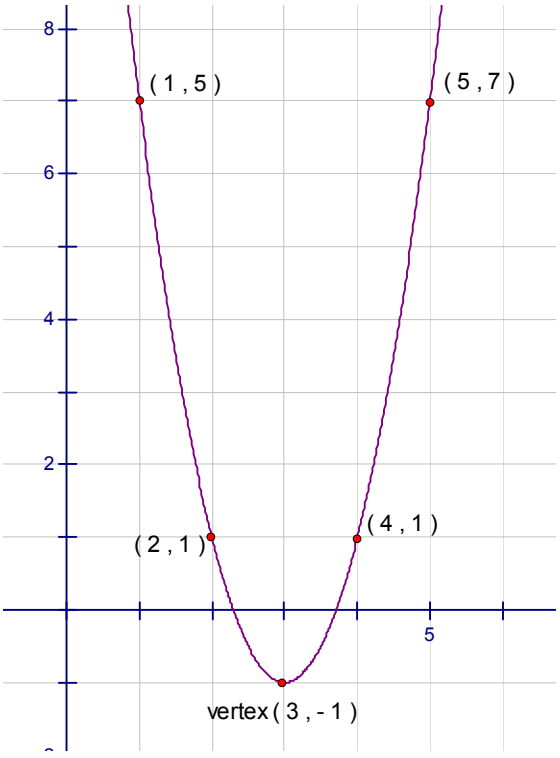
In order to graph a quadratic that undergoes multiple transformations, we start by describing each of the transformation separately in order to get a picture of what has happened to the original graph of $y = x^2$. These descriptions will help to locate the vertex and apply the stretch/compression or reflection. The goal here is to graph each quadratic without the need to construct a table of values. Recall: when a quadratic is in the form: $y = a(x-h)^2 + k$

'a' controls the vertical stretch/compression/reflection
'h' controls the horizontal translation left or right
'k' controls the vertical translation up or down

Check out this link: Angry Birds Level 1
http://www.teachmathematics.net/page/11419/angry-birds-2
This link will allow us to test our understanding of how each transformation works.

Now that we have a better understanding of each transformation, use this knowledge to describe the transformations and graph the quadratics. Remember to refer back to your basic shape when graphing any new quadratic in this form. Describe each of the transformations and graph the following quadratics using the established patterns.

a) $y = 2(x-3)^2 - 1$
vertical stretch by 2
horizontal translation to the right 3
vertical translation down 1



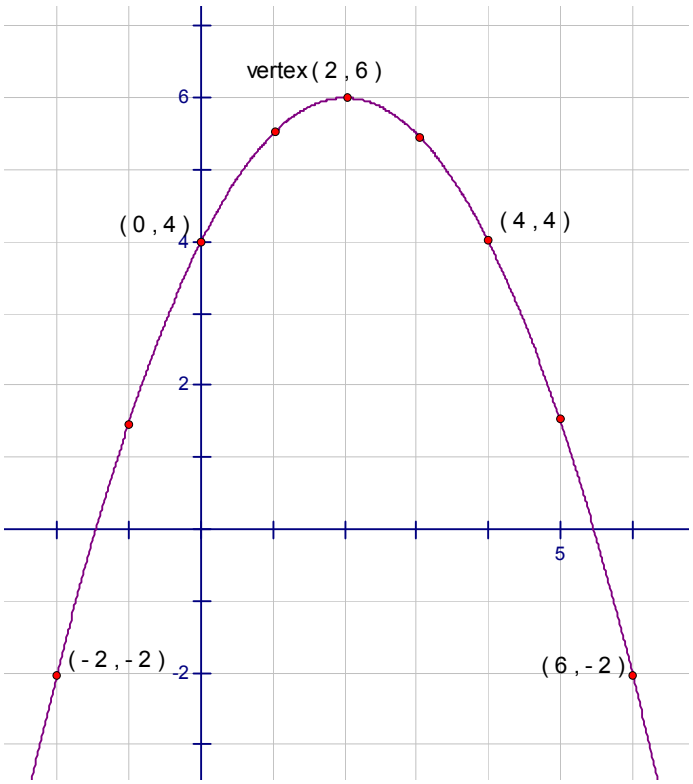
b) $y = \frac{-1}{2}(x-2)^2 + 6$

vertical reflection

vertical compression by $\frac{1}{2}$

horizontal translation to the right by 2

vertical translation up 6



Quadratics are used in video game design every day. What happens if our Angry Bird must hit a pig on another level… or begin his flight in a different place… Explore these scenarios using the Angry Birds link.

- ***homework assignment:*** **<u>Principles of Mathematics 10</u> p. 269 # 1 – 4, 6, 8, 10, 15**