

Before we begin, are there any questions from last day's work?

Today's Learning Goal(s):

By the end of the class, I will be able to:

- understand the roles of "a", "h" & "k" for vertex form: $y = a(x - h)^2 + k$
- understand the 3 basic transformations:
reflections, stretches/compressions, and translations

Note: There is no handout today.

Copy the goals on a blank sheet of paper.

Follow the instructions in the Google Classroom stream.

Discuss Gizmos Fix.

**When finished the Desmos activity, complete the "Graphic Organizer".
(Use pencil, so you can modify your answers if necessary.)**

pp. 178-179 #6, 7, 8, 9, 10* (graph this relation too, for s from 0 to 100, by 10's).

Enrichment: p.179 #13, 14

MPM 2DI

The roles of a , h & k in $y = a(x - h)^2 + k$

Date: Oct. 27 / 16

Based on class discussion, complete the following graphic organizer to summarize the roles of a , h and k .

<p>Role of a:</p> <p>Direction of Opening (Reflection):</p> <ul style="list-style-type: none"> When a is positive, the parabola opens <u>upwards</u> When a is negative, the parabola opens <u>downwards</u> <p>Shape (Vertical Stretch or Compression):</p> <ul style="list-style-type: none"> If $a > 1$ or $a < -1$, then the graph of $y = a(x - h)^2 + k$ is vertically <u>stretched</u>, which means it has a <u>thinner</u> opening than $y = 1(x - h)^2 + k$. If a is between -1 and 1, then the graph of $y = a(x - h)^2 + k$ is vertically <u>compressed</u>, which means it has a <u>wider</u> opening than $y = 1(x - h)^2 + k$. 	<p>Role of h:</p> <p>Properties (Horizontal Translation):</p> <ul style="list-style-type: none"> If $h > 0$, then the graph of $y = a(x - h)^2 + k$ is translated <u>horizontally</u> h units to the <u>right</u>. If $h < 0$, then the graph of $y = a(x - h)^2 + k$ is translated <u>horizontally</u> h units to the <u>left</u>. <p>Relation to the Vertex:</p> <ul style="list-style-type: none"> The value of h is the <u>x</u> - coordinate of the vertex.
<p>$y = a(x - h)^2 + k$</p>	
<p>Role of k:</p> <p>Properties (Vertical Translation):</p> <ul style="list-style-type: none"> If $k > 0$, then the graph of $y = a(x - h)^2 + k$ is translated <u>vertically</u> k units <u>up</u>. If $k < 0$, then the graph of $y = a(x - h)^2 + k$ is translated <u>vertically</u> k units <u>down</u>. <p>Relation to the Vertex:</p> <ul style="list-style-type: none"> The value of k is the <u>y</u> - coordinate of the vertex. 	<p>vertex (h, k)</p> <p>Example: $y = -2(x - 3)^2 + 5$</p> <p>State:</p> <ul style="list-style-type: none"> Coordinates of the vertex: <u>$(3, 5)$</u> $h=3$ $k=5$ Direction of opening: <u>downwards</u> Transformations (NOTE: there are 4): <p><u>vertically stretched by a factor of 2</u></p> <p><u>reflection in the x-axis</u></p> <p><u>vertical translation 5 units up</u></p> <p><u>horizontal translation 3 units right</u></p>