

## Grade 8

Distance Learning Module 5: Week of: April 27<sup>th</sup> – May 1st

## Mathematics - Grade 8 Algebra- Modified from Unit F - Beyond Straight Lines

### Targeted Goals from Stage 1: Desired Results

#### Content Knowledge:

- Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. (CCSS.MATH.CONTENT.HSA.SSE.B.3)
- Graph functions expressed symbolically and show key features of the graph. (CCSS.MATH.CONTENT.HSF.IF.C.7)
- Graph quadratic functions and show intercepts, maxima, and minima. (CCSS.MATH.CONTENT.HSF.IF.C.7.A)
- Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. (CCSS.MATH.CONTENT.HSF.IF.C.8)
- Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. (CCSS.MATH.CONTENT.HSF.IF.C.8.A)

#### Vocabulary:

- **Standard Form of Parabola**  $y = ax^2 + bx + c$
- **Vertex Form of Parabola**  $y = a(x + h)^2 + k$
- **Vertex** - Turning point, minimum or maximum value of a parabola
- **Axis of Symmetry** - Vertical line that goes through the vertex (splits parabola into 2 symmetrical halves)
- **Completing the Square** - Technique to transform parabola equation from Standard Form to Vertex Form and thus identify the vertex
- **$(-b/2a, f(-b/2a))$**  - Alternative way to find the vertex from Standard Form, (It's like how you use the ***a*** and ***b*** in the quadratic formula)
- **$-b/2a$**  : way to calculate x coordinate of vertex from standard form
- **$f(-b/2a)$**  : way to calculate y coordinate of vertex from standard form. It's function notation. Means to substitute your x - coordinate calculation into the standard form equation and solve for the y.

**Skills:** Identify vertex of parabola, Identify axis of symmetry, Identify maximum and minimum point, graph a parabola in Vertex Form, Complete the Square

#### Expectation:

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom/ Khan Academy)
<p>Monday:</p> <ul style="list-style-type: none"> <li>● Watch videos on basic concepts of parabolas</li> <li>● Practice with basics of parabolas</li> </ul>	<p>Instruction:</p> <p>Parabolas Intro (Khan) Vertex Form Introduction (Khan)</p>	<p><b>DO NOT use these links to Khan Academy. Log into your Khan account and complete these assignments through your individual teacher's Khan class. Teachers will assign these in their Khan classes.</b></p> <p>Identifying parts of parabola practice 1 (Khan) Identifying parts of parabola practice 2 (Khan)</p>
<p>Tuesday:</p> <ul style="list-style-type: none"> <li>● Watch videos on graphing of parabolas</li> <li>● Practice graphing parabolas</li> </ul>	<p>Instruction:</p> <p>Graphing Quadratics: Vertex Form (Khan) Rapid Graph of Parabola 1 (youtube) Rapid Graph of Parabola 2 (youtube)</p> <p>Practice:</p> <p>Graphing a parabola in vertex form (worksheet with answers) <b>you do not have to do all of the problems</b></p>	<p><b>DO NOT use this link to Khan Academy. Log into your Khan account and complete the assignment through your individual teacher's Khan class. Teachers will assign these in their Khan classes.</b></p> <p>Graphing Quadratics in Vertex Form Practice (Khan)</p>
<p>Wednesday:</p> <ul style="list-style-type: none"> <li>● Watch videos on how the <b><math>a</math>, <math>h</math>, and <math>k</math></b> affect the graph of a parabolas</li> <li>● Practice changing the <b><math>a</math>, <math>h</math>, and <math>k</math>.</b></li> </ul>	<p>Instruction:</p> <p>Effects of changing <math>a</math> (youtube) Intro to parabola transformations (Khan) Shifting parabolas (Khan)</p> <p>Practice:</p> <p>Desmos PracticeActivity sheet (This has a</p>	<p><b>DO NOT use this link to Khan Academy. Log into your Khan account and complete the assignment through your individual teacher's Khan class. Teachers will assign these in their Khan classes.</b></p> <p>Shift Parabolas Practice (Khan)</p>

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom/ Khan Academy)
	really good game)	
<p>Thursday:</p> <p>Completing the Square Part 1</p> <ul style="list-style-type: none"> <li>● Watch videos on how to complete the square</li> <li>● Practice completing the square</li> </ul>	<p>Instruction:</p> <p><b>Khan Completing the square for Vertex form(youtube)</b></p> <p><b>Worked example: Rewriting expressions by completing the square(Khan)</b></p> <p><b>Worked example: completing the square (leading coefficient not 1)(Khan)</b></p> <p>Practice: Completing the Square Practice Problems</p>	<p><b>DO NOT use these links to Khan Academy. Log into your Khan account and complete these assignments through your individual teacher's Khan class. Teachers will assign these in their Khan classes.</b></p> <p>Completing the square (intro)(Khan) Completing the square (intermediate)</p>
<p>Friday:</p> <p>Completing the Square Part 2</p> <ul style="list-style-type: none"> <li>● Watch videos on how to complete the square</li> <li>● Watch videos on <math>-b/2a</math> method</li> <li>● Practice completing the square and or <math>-b/2a</math> method</li> </ul>	<p>Instruction:</p> <p>Completing the Square 1 (youtube) Completing the Square 2 (youtube) <math>-b/2a</math> method (youtube)</p> <p>Practice:</p> <p>Mixed Review Practice worksheet (problems 1 4, 7, 19, 20 only)</p>	<p>Google Form Check-in (quiz)</p>

**Week criteria for success** (attach student checklists or rubrics):

1. I can identify the vertex of a parabola in vertex form and determine whether it is a minimum or maximum point.
2. I can quickly sketch the graph a parabola vertex form
3. I can find the vertex of a parabola in Standard Form by either Completing the Square or  $-b/2a$  method.

**Supportive resources and tutorials for the week** (plans for re-teaching):

Mr. Potter's smartboard notes pdf      PDF of classroom notes with examples, practice problems and answers

Mrs. Gwiazda's Google Slides