

Grade 9

Distance Learning Module 5: Week of: April 27 - May 1

Introduction to Parabolas and Graphing from Standard Form

Mathematics: Algebra I, Level 2 - Modified from [Unit F - Beyond Straight Lines](#)

Targeted Goals from Stage 1: Desired Results

Content Knowledge: The graph of a quadratic function is a parabola. Parabolas have properties and parts that define them, such as a vertex, axis of symmetry, direction, and corresponding points.

Vocabulary: vertex, axis of symmetry, corresponding points, y-intercepts, x-intercepts (solutions, zeros)

Skills: Solving $y = ax^2 + bx + c$ by graphing, finding the vertex of $y = ax^2 + bx + c$, finding the x- and y-intercepts of $y = ax^2 + bx + c$

Expectation:

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
Monday: Parts of (and features of) a parabola	Khan Academy: Parabolas intro Intro to parabolas (video)	Khan Academy: Parabolas intro (practice) Interpret a quadratic graph (practice)
Tuesday: Graphing $y = ax^2 + c$	Live instruction: Graphing a quadratic function when $b=0$ • using a table • minimum of 5 points • identify vertex, axis of symmetry, direction • Identify how many x-intercepts (zeros) there are, and how you know	Graph by hand using a table of values with 5 ordered pairs: 1. $y = 3x^2$ 2. $y = -2x^2$ 3. $y = x^2 - 10$ 4. $y = -\frac{1}{2}x^2 - 2$ Identify the vertex and axis of symmetry. State whether the parabola opens up or down, and how you know. Identify how many x-intercepts there are.

Description of Task (s):	Resources and Materials:	Daily Checks (Return to Google Classroom or snapshots from a cell phone)
Wednesday: Day 2 of graphing $y = ax^2 + c$	Office hours and supplemental resource Slide Share Please note: The author of this slide show should have used a smooth curve to draw these parabolas!	Brief Google Classroom Quiz
Thursday: Graphing $y = ax^2 + bx + c$ (finding the vertex and y-intercept)	Live instruction: Graphing any quadratic in standard form - Find the vertex using $x = \frac{-b}{2a}$ - Identify the axis of symmetry, y-intercept, direction - Identify how many x-intercepts (zeros) there are, and how you know - minimum of 5 points	Graphing Quadratic Functions Practice - Day 1
Friday: Day 2 of graphing $y = ax^2 + bx + c$ (including using Desmos to graph)	Mini-lesson: Using Desmos to verify graphs done by hand (tables and equations)	Graphing Quadratic Functions Practice - Day 2

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

By the end of this module, students will be able to:

- identify parts of a parabola
- graph quadratic functions in standard form (by hand and using technology)
- identify x-intercepts (“zeros”) of a quadratic function and when they do and don’t exist

Supportive resources and tutorials for the week (plans for re-teaching): Khan Academy, Kuta Software worksheets, live office hours