Unit 5: Graphing Polynomial Functions

Content Area: **Math**
Course(s):
Time Period:
Length: **4 classes**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Graphing Polynomial Function

Learning Objectives

- Objective 1 - Define quantities for descriptive modeling problems. (Incorporate appropriate units).
- Objective 10 - Use the zeros to construct a rough graph of a polynomial function.
- Objective 11 - Sketch a graph using the key features of a function.
- Objective 12 - Interpret key features from a graph or a table of values.
- Objective 13 - Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- Objective 14 - Write a function shown as an expression in equivalent forms.
- Objective 15 - Reveal different properties of a function by expressing it in different forms.
- Objective 16 - Use factoring and completing the square on quadratic functions to show zeroes, extreme, values, and symmetry.
- Objective 17 - Interpret zeroes, extreme values, and symmetry of a quadratic in context.
- Objective 2 - Identify zeros of polynomials using factoring.
- Objective 3 - Use the zeros to construct a rough graph of a polynomial function.
- Objective 4 - Sketch a graph using the key features of a function.
- Objective 5 - Interpret key features from a graph or a table of values.
- Objective 6 - Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- Objective 7 - Graph polynomial functions by hand and using technology.
- Objective 8 - Show key features including intercepts, maxima, minima, zeroes, end behavior.
- Objective 9 - Identify zeroes using factoring.

Essential Skills

- Essential Skill 1 - The artist will be able to define quantities for descriptive modeling problems. (Incorporate appropriate units)
- Essential Skill 10 - The artist will be able to reveal different properties of a function by expressing it in different forms.
- Essential Skill 11 - The artist will be able to use factoring and completing the square on quadratic functions to show zeroes, extreme, values, and symmetry.
- Essential Skill 12 - The artist will be able to interpret zeroes, extreme values, and symmetry of a quadratic in context.
- Essential Skill 2 - The artist will be able to identify zeros of polynomials using factoring.
- Essential Skill 3 - The artist will be able to use the zeros to construct a rough graph of a polynomial function.
- Essential Skill 4 - The artist will be able to sketch a graph using the key features of a function.
- Essential Skill 5 - The artist will be able to interpret key features from a graph or a table of values. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- Essential Skill 6 - The artist will be able to graph polynomial functions by hand and using technology.
- Essential Skill 7 - The artist will be able to show key features including intercepts, maxima, minima, zeroes, end behavior.
- Essential Skill 8 - The artist will be able to identify zeroes using factorization.
- Essential Skill 9 - The artist will be able to write a function shown as an expression in equivalent forms.

Standards

MATH.9-12.A.APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
MATH.9-12.N.Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.
MATH.9-12.F.IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
MATH.9-12.F.IF.C.7.c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
MATH.9-12.F.IF.C.8.a	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.

Instructional Tasks/Activities

- increasing/decreasing intervals and relative/absolute maximum/minimum and turning points
- Academic games & Competitions
- Arts inspired projects
- Finding zeros
- Formative Assessments
- Graphing polynomials

- Ladder Activity
- Polynomial Analysis
- Polynomials - Identify single root, double root and triple root.
- Worksheets

Assessment Procedure

- Classroom Total Participation Technique
- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Chromebook
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Forms
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz

- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load

- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment
- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

The honors track will move at a faster pace for this unit. They will have more in depth critical thinking and analysis type questions. They will also be able to compare and contrast the similarities and differences of a linear function versus a cubic function.

Resources

- https://njctl.org/courses/math/algebra-ii/