

Unit 4: Polynomials and Factoring

Algebra 1

15 Class Meetings

Created July 2020; Revised May 2022

Essential Questions

- How are the properties of real numbers related to polynomials?
- How can polynomials be simplified and applied to solve problems?

Enduring Understandings with Unit Goals

EU 1: Properties of real numbers apply to polynomials.

- Combine polynomials by adding, subtracting, and multiplying.

EU 2: Factoring is the inverse of multiplying polynomials.

- Factor polynomials with monomials.
- Factor polynomials as the product of two binomials

Standards

Common Core State Standards/College and Career Readiness Anchor Standards :

- **HS.A.APR.A.1:** Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
- **HS.A.SSE.A.1.A:** Interpret parts of an expression, such as terms, factors, and coefficients.
- **HS.A.SSE.B.3.A:** Factor a quadratic expression to reveal the zeros of the function it defines.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

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Unit Content Overview

1. Adding and Subtracting

- Find the Degree of a Monomial and Polynomial
- Add and Subtracting Monomials
- Add and Subtract Polynomials

2. Multiplying Monomials and Polynomials

- Multiply a Monomial and a Trinomial

3. Multiplying Binomials

- Use the Distributive Property
- Use the FOIL method to multiply two binomials
- Multiply a Trinomial and a Binomial

4. Factoring Out a GCF

- Find a Greatest Common Factor
- Factor Out a Monomial

5. Factoring $ax^2 + bx + c$

- Factor a quadratic expression where $b > 0$, $c > 0$
- Factor a quadratic expression where $b < 0$, $c > 0$
- Factor a quadratic expression where $c < 0$
- Factor a quadratic expression where $a = 1$, and $a \neq 1$

Interdisciplinary Connection:

- Language Arts- Accountable Talk, Word Problems

Daily Learning Objectives with *TWPS Activities*

Students will be able to...

- Classify a polynomial (Degree, terms, parts of a polynomial expression)
 - *Do Now: Solving a Multi-Step Equations (revisited)*
- Add and subtract polynomials by utilizing the properties of real numbers
 - *Do Now: Error Analysis #1 – Combine Like Terms*
- Multiply by a monomial (monomial, binomial, trinomial, and polynomial)
 - *Do Now: Error Analysis #2 – Combine Like Terms*
- Multiply two binomials
 - *Do Now: Area Models (revisited)*
- Multiply a trinomial by a binomial
 - *Do Now: Equivalent Equations*
- Factor using the Distributive Property
 - *Do Now: The Distributive Property (revisited)*
- Factor by grouping
 - *Do Now: Factoring using the Distributive Property*

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- Factor trinomials of the form $ax^2 + bx + c$ ***
 - Do Now: Using Proportionality to complete a table of values
 - Do Now: Unit Rate (revisited)
 - Do Now: Unit Rate (revisited)
- Factor Special Case Trinomials
 - Do Now: Writing an inequality

Instructional Strategies/Differentiated Instruction

- Whole-group instruction
- Creating authentic connections for students
- Rephrasing and restatement of information and concepts
- Guided notes
- Student-led instruction
- Small group instruction
- Independent problem-solving
- Collaborative problem-solving
- Cross-curricular problem solving (independent and collaborative)
- Accountable Talk
- Manipulatives
- Homework

EL DIFFERENTIATED INSTRUCTION:

- Word Walls with visuals
- TWPS (Think, Write, Pair, Share)
- Pre-reading strategies
- Culturally responsive teaching
- Explicit Modeling
- Key Vocabulary
- Graphic Organizers
- Strategic Grouping
- Non-verbal Assessments

Assessments

FORMATIVE ASSESSMENTS:

- Warm-ups (SBAC)
- Accountable Talk Discussions
- Daily Think-Write-Pair Share (TWPS)
- Daily Do Now
- Warm-ups (SBAC prep)
- ABCD Cards
- Whiteboards
- Mid-class check-ins
- Exit Slips
- Student-led instruction

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SUMMATIVE ASSESSMENTS:

- Quiz on EU 1
- Unit 9 Test
- IAB (Performance Task) – Baseball Tickets

Unit Task

Unit Task Name: Baseball Tickets

Description: In this IAB Performance Task, students are given a scenario involving season tickets and single tickets for three different locations to a baseball game. Students are to answer 6 different questions based on the information provided.

Evaluation: ISAAC Problem Solving Rubric

Unit Resources

- Flipped Google Classroom Videos
- Worksheets
- Calculator
- Laptops
- SBAC Prep Online
- Kahn Academy
- Match Fishtank
- Map.Mathshell.org
- Online resources