Unit 12: Polynomials

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Week 38**
Length: **2 Weeks**
Status: **Published**

Unit Overview

In this unit, students will be introduced to polynomials. Students will classify and state the degree of polynomials. They will learn how to place polynomials in ascending and descending order and how to add and subtract polynomials by combining like terms and by the column method. Students also will learn to multiply and divide polynomials.

Standards

MA.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.
MA.6.EE.A.2b	Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
MA.6.EE.A.3	Apply the properties of operations to generate equivalent expressions.

Essential Questions

- Why is important to have a strong foundation in integer rules before learning about polynomials?
- What visual aides are available to assist in multiplying polynomials?

Application of Knowledge and Skills...

Students will know that...

- A monomial refers to a single term; a binomial refers to two terms; and a trinomial refers to three terms.
- The degree of a polynomial is the degree of the largest term.
- When adding or subtracting polynomials, either combine the like terms, or use the column method.
- When dividing polynomials, expand the problem into multiple division problems; then follow the rules of exponents for dividing with exponents.

- When multiplying a monomial and a bi/trinomial, utilize the distributive property. When multiplying with exponents you must add the exponents together.
- When multiplying two binomials, set up a Punnett Square or utilize the FOIL method.
- When placing polynomials in descending order, order the terms beginning with the largest exponent.

Students will be skilled at...

Students will be able to:

- Add or subtract polynomials.
- Classify a polynomial as a monomial, binomial, or trinomial.
- Discover the degree of the polynomial by finding the term with the largest exponent.
- Multiply polynomials (monomial to bi/trinomial and binomial to a binomial).
- Order polynomials in either ascending or descending order.
- Simplify a polynomial expression by dividing.

Assessments

Digits Readiness Assessments:

The readiness assessment screens students on their understanding of the prerequisite content of a unit. Students are then assigned invidualized intervention lessons to address specific needs.

- Do Now Exercises Diagnostic: Instructional/Assessment Focus The purpose of these do now exercises is to review and remediate when necessary the concepts/skills/knowledge learned throughout the unit.
- Polynomial Posters Formative: Other written assessments Students will work in groups to create a poster that represents a specific concept related to polynomials. The students will present the poster to the class. All posters will be displayed.
- Polynomials Geometry Formative: Other written assessments This assessment wil require students to apply their knowledge of geometry to polynomials. Students will simplify expressions for the perimeter and the area of geometric figures.
- Unit Test Summative: Written Test Students will be assessed on the skills/concepts/knowledge in this unit.

Activities

- **Polynomials Puzzle:** in this activity taken from the activity generator, in pairs, students will simplify polynomial expressions by using FOIL. Students will match puzzle pieces depicting the simplified expression and the original expression.
- **Interactive Smartboard** presentations will include polynomial operations and classifications. Students will manipulate various polynomials and place them in the correct classification. Students will also combine various monomials that are considered “like terms” and will manipulate polynomial expressions to add or subtract.
- **Smart pal** review games will include all types of polynomial operations.
- Digits cd grade 8

Launch Activity: Mathematics of Sound r4: In this activity students will solve problems about sound to simplify powers with positive and negative exponents.

Activities to Differentiate Instruction

- **Polynomial Geometry:** in this worksheet, students will be challenged to apply the concept of geometry to polynomials. Students will write and simplify expressions for the area or perimeter of geometric figures.

Small group sessions to review polynomial concepts.

- **Digits Supported Materials:**
    - Math XL Printables
    - Leveled Homework G and K
    - Help Me Solve This: This function scaffolds math problems by asking prompting question at each individual step.
    - View An Example: This function provides a fully worked out step-by-step solution of a similar problem.
    - Readiness Assessment: After a student completes the readiness assessment intervention lessons are individually assigned to address prerequisite skills .
    - Tools: On line manipulatives

Integrated/Cross-Disciplinary Instruction

- **Science:** compare the Punnett Square used to multiply binomials to the one they have utilized in science class.

Resources

Digits teacher materials and support: www.pearsonrealize.com

Digits student access and support: www.MyMathUniverse.com

SMART Exchange

Smartboard Lessons

-373Punchline/Pizzazz worksheets (self correcting)

Kuta generated worksheets dealing with percents and percent applications

Kuta generated worksheets dealing with polynomial operations

Polynomial puzzle directions and game pieces

Polynomial Geometry worksheet

Calculators

21st Century Skills

CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
CRP.K-12.CRP12.1	Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.