



Unit 7 Polynomial Operations and Models Algebra 1

Last Update: August 1, 2025

Archdiocesan Curriculum > Grade > Math -Algebra > Length of unit 13 to 14 days

Stage 1: Desired Results						
General Information This unit focuses on performing polynomial operations, including multiplication of monomials, binomials, and trinomials, and identifying and simplifying like terms through addition and subtraction. Students also explore special products and use polynomial expressions to model and solve real-world mathematical problems. Mathematical Practices: - MP1 – Make sense of problems and persevere in solving them. - MP2 – Reason abstractly and quantitatively. - MP4 – Model with mathematics. - MP6 – Attend to precision. - MP7 – Look for and make use of structure.	Essential Question(s) - How do the properties of exponents help simplify expressions involving monomials? - What patterns can be identified when multiplying binomials and trinomials? - How can identifying like terms help in simplifying polynomial expressions? - What makes certain binomial products “special,” and how can recognizing them simplify calculations? - How can polynomials be used to model and solve real-world problems?					
	Enduring Understanding/Knowledge Students will: - Multiply monomials and raise monomials to powers to solve real-world problems. - Multiply monomials, binomials, and trinomials. - Find special products of binomials. Review/Assess - Identify like terms in polynomials in the process of addition or subtraction. - Model mathematical and real-world problems with polynomials. Review/Assess	Vocabulary <table><tr><th>New</th><th>Review</th></tr><tr><td> - degree of a monomial - monomial - binomial - degree of a polynomial - leading coefficient - polynomial - standard form of a polynomial - trinomial - perfect-square trinomial - figurate numbers </td><td> - exponent - term - coefficient - variable - expression - like terms - distributive property </td></tr></table>		New	Review	- degree of a monomial - monomial - binomial - degree of a polynomial - leading coefficient - polynomial - standard form of a polynomial - trinomial - perfect-square trinomial - figurate numbers
New	Review					
- degree of a monomial - monomial - binomial - degree of a polynomial - leading coefficient - polynomial - standard form of a polynomial - trinomial - perfect-square trinomial - figurate numbers	- exponent - term - coefficient - variable - expression - like terms - distributive property					
Connections to Catholic Identity / Other Subjects Religion/Catholic Identity: - Catholic Teaching: The Value of Discipline and Structure - The Catholic faith emphasizes discipline as a way of growing in virtue and holiness. Learning the rules of exponents and the systematic approach to simplifying polynomials encourages a similar discipline in intellectual life. - Connection: Just as math has rules and structures (e.g., laws of exponents), Catholicism emphasizes living a life of discipline and order. The structure within algebraic expressions mirrors the structure in our lives as we seek to live according to God’s	Differentiation Enrichment Multiply monomials and raise monomials to powers to solve real-world problems – Challenge students to apply exponent rules in scientific contexts such as physics formulas or compound interest models. Multiply monomials, binomials, and trinomials – Extend to higher-degree polynomials and explore the structure of polynomial division or factoring of resulting products. Find special products of binomials – Have students create and prove general rules for special products (e.g., $(a+b)^2=a^2+2ab+b^2$$(a+b)^2 = a^2 + 2ab + b^2$$(a+b)^2=a^2+2ab+b^2$) and apply them in					

commandments. • Catholic Reference: "Whoever loves discipline loves knowledge, but whoever hates correction is stupid" (Proverbs 12:1). Other Subject Here: • Art : Students can create a tower cake. They can perform arithmetic operations on polynomials. They will find the volume of each cyclical tower. They will use the volume of the cylinder formula. Then the students can rewrite the volume as the product of a monomial and polynomial.	reverse to factor polynomials. • Identify like terms in polynomials in the process of addition or subtraction – Introduce students to combining polynomials with more complex variable combinations or negative exponents. • Model mathematical and real-world problems with polynomials – Assign modeling tasks using polynomial functions to analyze real-world scenarios such as area, profit, or population growth using higher-degree equations. Support • Multiply monomials and raise monomials to powers to solve real-world problems – Use color-coded exponents and step-by-step anchor charts. Start with numeric monomials before moving to variables. • Multiply monomials, binomials, and trinomials – Provide guided notes and use algebra tiles or area models to represent each multiplication step visually. • Find special products of binomials – Use patterns and graphic organizers to support recognition of perfect squares and difference of squares with scaffolded practice. • Identify like terms in polynomials in the process of addition or subtraction – Begin with highlighting and sorting like terms. Use matching activities and manipulatives to group terms. • Model mathematical and real-world problems with polynomials – Start with contextual word problems using only two terms. Offer sentence frames to guide students in writing expressions.
--	---

Standards & Benchmarks

Polynomial Multiplication:

A2.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.

A1.A-SSE.A.2

Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

A2.A-SSE.A.2

Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

CCSS.Math.Content.HSA-SSE.A.2

Use the structure of an expression to identify ways to rewrite it.

CCSS.Math.Content.HSA-SSE.A.1.b

Interpret complicated expressions by viewing one or more of their parts as a single entity.

Polynomial Addition and Subtraction:

A1.A-REI.A.1

Explain each step in solving equations as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (A1 and A2)

A2.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.

A2.A-REI.A.1

Explain each step in solving an equation as following from the equality of numbers asserted at the previous step,

starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. (A1 and A2)

CCSS.Math.Content.HSF-BF.A.1.a

Determine an explicit expression, a recursive process, or steps for calculation from a context.

CCSS.Math.Content.HSA-REI.A.1

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Teaching Ideas/Resources

Websites/Resources:

Classifying Polynomials:

- Classifying by degree and term worksheet [Link](#)

Adding and Subtracting Polynomials:

- Adding and Subtracting Mashup Math worksheet [Link](#)

Multiplying Polynomials:

- Binomial by Binomial Mashup Math worksheet [Link](#)

General Links for all Units

- Delta Math: [Link](#)
- Kuta Math: [Link](#)
- Blooket: [Link](#)
- Desmos: [Link](#)
- PlayPosit: [Link](#)
- NearPod: [Link](#)
- Gimkit: [Link](#)
- Mashup Math: [Link](#)