Honors Algebra 2 UNIT PLANNER

Unit title	DOE Unit 2 – Operations with Polynomials	Unit duration	4 weeks

Essential Questions (OR GUIDING QUESTIONS?)

- How can we write a polynomial in standard form?
- How can we write a polynomial in factored form?
- How do we add, subtract, multiply, and divide polynomials?
- In which operations does closure apply?
- How can we apply Pascal's Triangle to expand $(x+y)^n$?
- How are a function and its inverses related?

Assessments

Common Formative Assessment – TOTD Operations with Polynomials, TOTD Operations with Functions

Common Summative Assessment – Unit assessment

Content Standards

Perform arithmetic operations on polynomials

MGSE9-12.A.APR.1 Add, subtract, and multiply polynomials; understand that polynomials form a system analogous to the integers in that they are closed under these operations.

Use polynomial identities to solve problems

MGSE9-12.A.APR.4 Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ *can be used to generate Pythagorean triples.*

MGSE9-12.A.APR.5 Know and apply that the Binomial Theorem gives the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined using Pascal's Triangle.

Rewrite rational expressions

MGSE9-12.A.APR.6 Rewrite simple rational expressions in different forms using inspection, long division, or a computer algebra system; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x).

Build a function that models a relationship between two quantities

MGSE9-12.F.BF.1 Write a function that describes a relationship between two quantities.

MGSE9-12.F.BF.1b Combine standard function types using arithmetic operations in contextual situations (Adding, subtracting, and multiplying functions of different types).

MGSE9-12.F.BF.1c Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*

MGSE9-12.N.CN.8 Extend polynomial identities to include factoring with complex numbers. *For example, rewrite $x^2 + 4$ as $(x + 2i)(x – 2i)$*

Build new functions from existing functions – **Will be introduced and continued with the DOE Unit 5 Exponential and Logarithmic Relationships**
MGSE9-12.F.BF.4 Find inverse functions.
MGSE9-12.F.BF.4a Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) =2(x^3)$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.
MGSE9-12.F.BF.4b Verify by composition that one function is the inverse of another.
MGSE9-12.F.BF.4c Read values of an inverse function from a graph or a table, given that the function has an inverse.

Learning Activities and Experiences

Topic	Resource	Content Covered	Standards Addressed
Operations on Polynomials	**3-2 Adding, Subtracting, and Multiplying Polynomials Pearson enVision pg. 139 - 145**	• Add, subtract, and multiply polynomials and understand that polynomials are closed under these operations • Compare a polynomial function represented algebraically with one represented graphically.	**MGSE9-12.A.APR.1** **MGSE9-12.F.BF.1**
	5-5 Function Operations Pearson enVision pg. 273 - 280	• Combine functions by addition, subtraction, multiplication or division, and identify the domain of the result. • Compose functions, specifying the order in which the functions are applied and describing the domain of the composition.	**MGSE9-12.A.APR.1** **MGSE9-12.A.APR.6** **MGSE9-12.F.BF.1b** **MGSE9-12.F.BF.1c**
	3-4 Dividing Polynomials Pearson enVision pg. 154 - 161	• Divide polynomial expressions using long division. • Use synthetic division to rewrite rational expressions.	**MGSE9-12.A.APR.6**
	Additional Resources:		
Identities & Binomial Theorem	**3-3 Polynomial Identities Pearson enVision pg. 146 - 153**	• Prove polynomial identities and use them to multiply and factor polynomials. • Expand binomials using the Binomial Theorem and coefficients determined by Pascal's Triangle.	**MGSE9-12.A.APR.4** **MGSE9-12.A.APR.5** **MGSE9-12.F.IF.8**
	Additional Resources:		

Personalized Learning and Differentiation

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

-SWD/504- Accommodations provided
-ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports
-Intervention Support- Re-teaching Activities in Small Groups with Progress Monitoring
-Extensions- Enrichment Tasks and Projects

Resources
Savvas Algebra 2 Textbook & Resources
GADOE Task and Resources