Algebra II – Unit 4: Polynomial Functions

Phoenixville Area School District

Stage 1 Desired Results

PA Core Standards:

CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents.

CC.2.1.HS.F.7 Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.

CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.

CC.2.2.HS.D.4 Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.

CC.2.2.HS.D.5 Use polynomial identities to solve problems.

Transfer

TRANSFER GOALS

Students will be able to independently use their learning to…

- *Number Sense:* Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns.
- *Fluency:* Demonstrate automatic recall of addition, subtraction, multiplication, and division of rational numbers.
- *Problem-Solving:* Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response.
- *Reasoning:* Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies.

Meaning

UNDERSTANDINGS

Students will understand that…

- Mathematicians flexibly use symbols, numbers, words, and visual representations while maintaining the integrity of the relationship between quantities.
- Variables represent the unknown so that mathematicians can generalize a pattern rather than being limited to looking at specific values.
- Algebraic rules and properties determine how expressions are simplified and how equations are solved.
- Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic) are used to model relationships between quantities in real-world situations.
- Patterns and functions can be generalized and represented using; verbal models, tables, equations, and graphs.

ESSENTIAL QUESTIONS

Students will keep considering...

- What is the question asking? How do I get there?
- What is the nature of the relationship? How do I represent it?
- What does this quantity/number/ expression/value mean? What are the ways to represent it? Is there a best way?
- What tools should I use here to be most efficient and effective?
- What counts as an adequate solution? Does my answer make sense?

CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations. CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.	***Knowledge and Skills Acquisition***	
	KNOWLEDGE *Students will know…* • How to simplify expressions using integer exponent properties • How to write, evaluate, graph, and analyze polynomial functions • How to add, subtract, multiply, and divide polynomials • How to find all of the real and imaginary zeroes of a polynomial function • How to apply the Fundamental Theorem of Algebra to write, graph, and analyze polynomial functions VOCABULARY • Polynomial • Long and Synthetic Division • Rational Zero Theorem • Remainder Theorem • Fundamental Theorem of Algebra	SKILLS *Students will be skilled at…* • Simplifying expressions involving integer exponents through multiple choice and open response questions • Writing, evaluating, graphing, and analyzing polynomial functions through multiple choice, matching, and open response questions • Adding, subtracting, multiplying, and dividing polynomial expressions through open response questions • Using the Rational Zero Theorem and the Fundamental Theorem of Algebra to find all of the zeros of a polynomial functions and write a polynomial function through open response and constructed response questions

Stage 2 – Evidence			
Code A/M/T	**Evaluative Criteria**	**Assessment Evidence**	
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the desired results?*	PERFORMANCE TASK(S) *Students will demonstrate understanding (meaning making and transfer) through complex performance by...* **[Performance Assessment Title]** [Performance Assessment Description] • *Goal:* Your task is to... • *Role/Audience:* You are a... • *Situation/Product:* You will... • *Success Criteria:* Your [product] must include...	Differentiation Considerations:
A/M/T Acquisition Meaning Making Transfer	*What criteria will be used in each assessment to evaluate attainment of the desired results?*	OTHER EVIDENCE **[Unit Test]** • [Multiple Choice] • [True/False] • [Matching] • [Constructed Response Prompts:]	Differentiation Considerations: