



Honors Algebra 2 UNIT PLANNER



Unit title	DOE Unit 3 - Polynomial Functions	Unit duration	3 weeks
Essential Questions (OR GUIDING QUESTIONS?)			
<ul style="list-style-type: none">• What is the Remainder Theorem and what does it tell us?• What is the Rational Root Theorem and what does it tell us?• What is the Fundamental Theorem Algebra and what does it tell us?• How can we solve polynomial equations?• Which sets of numbers can be solutions to polynomial equations?• What is the relationship between zeros and factors?• What characteristics of polynomial functions can be seen on their graphs?• How can we solve a system of a linear equation with a polynomial equation?			
Assessments			
Quiz on shape of polynomial functions, even and odd Unit assessment			
Content Standards			
<p><u>Use complex numbers in polynomial identities and equations.</u> MGSE9-12.N.CN.9 Use the Fundamental Theorem of Algebra to find all roots of a polynomial equation.</p> <p><u>Interpret the structure of expressions</u> MGSE9-12.A.SSE.1 Interpret expressions that represent a quantity in terms of its context. MGSE9-12.A.SSE.1a Interpret parts of an expression, such as terms, factors, and coefficients, in context. MGSE9-12.A.SSE.1b Given situations which utilize formulas or expressions with multiple terms and/or factors, interpret the meaning (in context) of individual terms or factors. MGSE9-12.A.SSE.2 Use the structure of an expression to rewrite it in different equivalent forms. 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 $(x^2 - y^2)(x^2 + y^2)$.</p> <p><u>Understand the relationship between zeros and factors of polynomials</u> MGSE9-12.A.APR.2 Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$. MGSE9-12.A.APR.3 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.</p>			

Interpret functions that arise in applications in terms of the context

MGSE9-12.F.IF.4 Using tables, graphs, and verbal descriptions, interpret the key characteristics of a function which models the relationship between two quantities. Sketch a graph showing key features including: intercepts; interval where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. *(Limit to polynomial functions.)*

Analyze functions using different representations

MGSE9-12.F.IF.7 Graph functions expressed algebraically and show key features of the graph both by hand and by using technology. *(Limit to polynomial functions.)*

MGSE9-12.F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

Learning Activities and Experiences

Topic	Resource	Content Covered	Standards Addressed	
Characteristics of / Graphing Polynomials	3-1 Graphing Polynomial Functions Pearson enVision pg. 131 – 138	<ul style="list-style-type: none"> Graph polynomial functions and show key features of the graph. Predict the end behaviour of polynomial functions by interpreting the leading coefficients and degrees. Sketch graphs showing key features, given a verbal description. 	MGSE9-12.A.SSE.1 MGSE9-12.A.SSE.1a MGSE9-12.A.SSE.1b MGSE9-12.F.IF.4 MGSE9-12.F.IF.7 MGSE9-12.F.IF.7c	
	3-7 Transformations of Polynomial Functions Pearson enVision pg. 179 – 186	<ul style="list-style-type: none"> Recognize even and odd functions from their graphs and algebraic equations. Identify the effect on the graphs of cubic and quartic functions of replacing $f(x)$, with $f(x) + k$, $kf(x)$, and $f(x + k)$. 	MGSE9-12.F.IF.4 MGSE9-12.F.IF.7 MGSE9-12.F.IF.7c	
	Additional Resources: <ul style="list-style-type: none"> DOE Framework Tasks (and MHS edits) <ul style="list-style-type: none"> Polynomial Patterns Task Polynomial Potpourri Representing Polynomials 			
	3-5 Zeros of Polynomial Functions Pearson enVision pg. 162 – 169	<ul style="list-style-type: none"> Identify the zeros of a function by factoring or using synthetic division. Use the zeros of a polynomial function to sketch its graph. 	MGSE9-12.N.CN.9 MGSE9-12.A.APR.2 MGSE9-12.A.APR.3 MGSE9-12.F.IF.7c	
	3-Act Task What are the Rules Pearson enVision pg. 170	<ul style="list-style-type: none"> 		
	3-6 Theorems about Roots of Polynomial Equations Pearson enVision pg. 171 – 178	<ul style="list-style-type: none"> Extend polynomial theorems and identities to find the real and complex solutions of polynomial equations. Write polynomial functions using conjugates. 	MGSE9-12.N.CN.9 MGSE9-12.A.APR.2 MGSE9-12.F.IF.7c MGSE9-12.A.SSE.2	

	<p>Additional Resources:</p> <ul style="list-style-type: none"> ● DOE Framework Tasks (and MHS Edits) <ul style="list-style-type: none"> ○ Factors, Zeros, Roots, Oh My! ○ Polynomial Project Culminating Task Pt. 1, Pt. 2
Personalized Learning and Differentiation	
<p>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.</p> <ul style="list-style-type: none"> -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	
<p>Savvas Algebra 2 Textbook & Resources</p> <p>GADOE Task and Resources</p>	