



Algebra 2 Level 2 - Unit 4 - Polynomial Functions

Unit Focus

Students will perform operations on polynomials, adding, subtracting, multiplying and dividing. They will be able to graph polynomial functions by factoring to find the zeroes and understanding end behavior and multiplicities.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
Common Core Mathematics: 9-12 - 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. (CCSS.MATH.CONTENT.HSA.APR.A.1) - 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 $p(x)$. (CCSS.MATH.CONTENT.HSA.APR.B.2) - 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. (CCSS.MATH.CONTENT.HSA.APR.B.3) - Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1) - Use appropriate tools strategically. (CCSS.MATH.MP.5) - Attend to precision. (CCSS.MATH.MP.6) Madison Public Schools Profile of a Graduate - Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying assumptions, patterns, and relationships in order to make inferences. (POG.1.2) - Idea Generation: Studying a problem, need or model (mentor text, political piece, documents, art work, etc.) to consider limitations and imagine new solutions/transformations. (POG. 2.1)	<i>Students will be able to independently use their learning to...</i> T1 manipulate equations/expressions or objects to create order and establish relationships. T2 make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution. T3 work respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective.	
	Meaning	
	Understanding(s)	Essential Question(s)
	<i>Students will understand that...</i> U1 Mathematicians examine relationships to discern a pattern, generalizations, or structure. U2 Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions.	<i>Students will keep considering...</i> Q1 How can I break a problem down into manageable parts? Q2 What does the graph/function tell me? Q3 Does this solution make sense? Q4 Is there another way to represent this?
	Acquisition of Knowledge and Skill	
	Knowledge	Skill(s)
	<i>Students will know...</i> K1 properties of polynomial functions - exponents and end behavior K2 how to find real and complex zeros of a function K3 how to identify multiplicity of a function K4 understand usefulness of the remainder theorem to evaluate complicated functions K5 understand the Fundamental Theorem of Algebra K6 Vocabulary: multiplicity, roots, synthetic division	<i>Students will be skilled at...</i> S1 determining right and left end behaviors from leading term S2 using rational roots theorem to determine possible zeros S3 using long and synthetic division to determine complete factorization of a polynomial S4 sketching a graph of a polynomial function, using end behavior, degree, x and y intercepts, zeros and multiplicities S5 "building a polynomial function" from a graph or from a set of parameters such as degree and zeros (including complex)