

Mount Pleasant Central School District

Algebra 2R, Math



We believe that students should learn the mathematical practice standards by showing the connections between real world problems and mathematical solutions by modeling, explorations and discovery.

How can we communicate mathematical understanding of the real-world using appropriate complex algebraic language/models? In this class, students will study advanced algebra topics that build on their work with functions and geometric principles. Our main goal is to have students continue to explore functions, including absolute value, polynomials, exponential and logarithmic functions, and expand their understanding of polynomials, complex numbers, radical expressions, and rational expressions and equations. We emphasize connecting mathematical concepts through multiple representations and encourage critical thinking and problem solving, promoting independent thinking. The ultimate goal is for students to master the ability to justify and communicate their reasoning process and solutions. Assessment will be primarily through summative assessments and performance-based tasks.

Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
Algebra Foundations	September	*Variables *Terms *Expressions *Solving linear expressions	-Term -Exponent -Coefficient -Variable	Interpret the structure of expressions. (AII-A.SSE)	Show foundational components of Algebra 1 skills.	Algebra 1	An exam with focused questions on skill and application.
Functions	September	*Function notation *Composition *Domain and range *One-to-one *Inverse *Key features	-Definitions of function, one-to-one function, domain, range, and inverse -Function notation, -Composition -Domain and range -One to one -Inverse -Key features	Understand the concept of a function and use function notation. (AII-F.IF)	*Students will distinguish when a relation is a function. *Students will evaluate functions at various inputs using a variety of representations.	Recognizing the visual and algebraic connection between function input and domain, function outputs and range.	An exam with focused questions on skill and application.
Linear Functions	October	*Direct variation *Average rate of change	-Factor (verb vs. noun) -Conjugate -GCF -Grouping	Construct and compare linear, quadratic, and exponential models and solve problems.	-Students will create linear models of real-world applications.	Understanding how to manipulate functions into a standard linear form.	An exam with focused questions on skill and application.

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				(AII-F.LE)	-Students will interpret relationships between multiple lines based on slope and intercept.	Identifying the components of the linear form are and can be applied to.	
Exponentials and Logarithms	October	*Exponential equations *Exponent relationships with logarithmic functions	Base Exponent Inverse	Analyze functions using different representations. (AII-F.IF)	Students will apply exponential and logarithmic properties to solve equations.	Exponential functions and logarithmic functions are inverses of one another.	Exam with focused questions on skill and application.
Sequence and Series	November	*Summation notation *Arithmetic series *Geometric series	Arithmetic, Geometric Nth term Sum	Build a function that models a relationship between two quantities. (AII-F.BE)	Students will model series and sequences. Students will calculate sums and specific values in a sequence.	Exploring how to create equations to symbolize patterns and implement them.	Exam with focused questions on skill and application.
Quadratic Functions	December - February	*Factoring *Complete the square	- Turning point/vertex - Zeros - Vertex form - Factored form - Standard form	Write expressions in equivalent forms to reveal their characteristics. (AII-A.SSE)	*Students will describe key features of a quadratic function (turning point/vertex, maximum/minimum,	Functions of a variety of forms and degrees can be factored into building block components which can be used to further	Exam with focused questions on skill and application.

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					intercepts). *Students will express quadratic equations in various forms (standard, factored, vertex).	understand the function itself.	
Transformations	February	*Shifting and reflecting parent functions.	Horizontal Vertical Reflect Translate Dilate	Build new functions from existing functions. (AII-F.B)	*Students will model a new function based on a parent function and known movements.	Applying knowledge of transformation to understand how a graph has been moved without using calculations.	Exam with focused questions on skill and application.
Radicals and Quadratic Formula	March	*Square root functions *Quadratic equation	Root Radicand Inverse	Understand solving equations as a process of reasoning and explain the reasoning. (AII-A.RE)	Students will simplify radicals and apply knowledge to quadratic equations.	Radicals of multiple degrees share similar properties that have a variety of applications.	Exam with focused questions on skill and application.
Complex Numbers	April	*Imaginary numbers *Complex numbers	Real numbers Imaginary numbers Cycle	Perform arithmetic operations with complex numbers. (AII-N.CN)	Students will simplify complex expressions with multiple operations.	Imaginary numbers exist and open a new avenue of algebraic focus in a complex world.	Exam with focused questions on skill and application.

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Polynomials & Rational Functions	May - June	*Power functions *Graphs *Zeroes of a polynomial	Zeroes Minimum Maximum Rational numbers, Irrational numbers	Interpret the structure of expressions. (AII.A.SSE)	Students will describe end behavior of polynomial function. Students will describe root behavior of polynomial functions.	Polynomial equations of varying degrees can be broken into components that can be used to describe the visual depiction of that function.	Exam with focused questions on skill and application.
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