School District of Loyal
DC Intermediate Algebra (Algebra 2)
Grade: 10-11
Student Learning Targets

Class: DC Intermediate Algebra (Algebra 2)

Students who demonstrate understanding can:		
WI State Standards	**Standard:**	**Student Learning Targets:**
M.N.CN.A.1	Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form *a* + *bi* with *a* and *b* real. Understand why complex numbers exist.	**Students will be able to:** ● Identify whether or not a number is complex. ● Identity situations in which complex numbers will be necessary.
M.N.CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	**Students will be able to:** ● Simplify expressions including complex numbers. ● Solve problems including complex numbers.
M.N.CN.A.3	Find the conjugate of a complex number; use conjugates to find moduli (absolute values) and quotients of complex numbers.	**Students will be able to:** ● Write the complex conjugate of a given complex number. ● Use complex conjugates to simplify expressions and solve equations using complex numbers.
M.N.CN.C.7	Solve quadratic equations with real coefficients that have complex solutions. Recognize when the quadratic formula gives complex solutions and write them as *a* ± *bi* for real numbers a and b.	**Students will be able to:** ● Solve a quadratic equation with imaginary solutions ● Use the quadratic formula to determine the imaginary solutions to a polynomial.
M.N.CN.C.9	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	**Students will be able to:** ● Identify the quantity of solutions - real or complex - for any given polynomial. ● Prove that all quadratic functions have exactly 2 solutions, real or complex.
M.A.APR.A.1	Add, subtract, and multiply polynomials.	**Students will be able to:** ● Use varying methods such as distribution or the box method to multiply polynomials with 3 or more terms.

M.A.APR.C.4	Rewrite simple rational expressions in different forms, using inspection, long division, and remainders.	**Students will be able to:** ● Write a rational function as a sum or difference of whole or rational terms.
M.A.APR.D.7	Add, subtract, multiply, and divide rational expressions.	**Students will be able to:** ● Simplify expressions involving rational variables.
M.A.REI.B.3	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	**Students will be able to:** ● Solve equations involving rational variables. ● Identify any extraneous solutions for a rational equation, and explain why those solutions are extraneous.
M.A.REI.B.4	Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula, factoring, and graphing as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	**Students will be able to:** ● Rewrite a quadratic equation in standard form to vertex form by completing the square. ● Rewrite a quadratic equation in vertex form to standard form by distribution. ● Rewrite a quadratic equation in standard form to factored form by using the quadratic formula if there are imaginary solutions or by factoring. ● Understand how each of the three forms of quadratic functions pertain to the parabolic graph.
M.F.IF.B.6	Calculate and interpret the average rate of change of a linear or nonlinear function. Estimate rate of change from a graph.	**Students will be able to:** ● Find the average rate of change for nonlinear functions given two points. ● Estimate average rate of change given a graph or table.
M.F.IF.C.7 M.F.IF.C.7a (F2Y)	Graph functions expressed symbolically and show the provided key features of the graph using an efficient method for: ● Linear and quadratic functions, showing intercepts, maxima, minima ● Exponential functions showing intercepts and end behavior ● Radical functions ● Piecewise-defined functions, including absolute value and step functions ● Polynomial functions, identifying zeros and end behavior	**Students will be able to:** ● Graph a quadratic equation in standard, factored, or vertex form. ● Identify key parts of a quadratic graph, such as the zeros, axis of symmetry, vertex, and y-intercept. ● Graph exponential functions using a minimum of two reference points. ● Identify key portions of an exponential function, including any intercepts and the end behavior. ● Graph a radical function using the appropriate reference points and end behavior for the index of the radical. ● Graph a piecewise-defined function for the correct domain values.

	• Rational functions, identifying zeros, asymptotes, and end behavior • Logarithmic functions, showing intercepts and end behavior • Trigonometric functions, showing period, midline, and amplitude.	• Understand that an absolute value function is a 2-domain piecewise function. • Graph an absolute value function, identifying its vertex, possible zeros, and slope of each ray. • Understand that a step function and floor function are identical. • Graph a step function • Identify the number of turning points of a polynomial function using its relationship with the Fundamental Theorem of Algebra. • Graph a polynomial function using the function's zeros, y-intercept, and end behavior. • Find all the asymptotes of a rational function, vertical and horizontal. • Use the asymptotes of a rational function and the subsequent end behavior of that function to graph it. • Graph a logarithmic function from at least two reference points. • Identify the end behavior of a given logarithmic function. • Identify the period, midline, and amplitude of a trigonometric function from an equation. • Graph at least two periods of a harmonic function.
M.F.IF.C.8 (F2Y)	Write a function defined by an expression in equivalent terms to reveal and explain different properties of the function, using factorizations of quadratics and properties of exponents.	**Students will be able to:** • Simplify complex functions using factoring and exponent properties. • Understand the consequences of certain simplifications such as cancelling binomials to create discontinuities in a graph.
M.F.BF.B.3	Identify the effect on the graph using transformations. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	**Students will be able to:** • Transform linear, quadratic, rational, exponential, polynomial, logarithmic, trigonometric, and piecewise-defined functions on a coordinate plane. • Identify whether a function is even, odd, or neither.
M.F.BF.B.4	Identify and create inverse functions, using tables, graphs, and symbolic methods to solve for the other variable.	**Students will be able to:** • Find the inverse of any function given as a table, graph, or equation. • Isolate a given variable for a function.

M.F.BF.B.5	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	**Students will be able to:** ● Use exponents and logarithms interchangeably. ● Use logarithms to solve exponential equations ● Use exponentials to solve logarithmic equations.