



Correlation to Algebra 1 Michigan Merit Curriculum

	Mathematics Curriculum Framework	Lesson Number	Lesson Title
Standard L1: Reasoning about Numbers, Systems, and Quantitative Situations			
L1.1.1	Know the different properties that hold in different number systems and recognize that the applicable properties change in the transition from the positive integers to all integers, to the rational numbers, and to the real numbers.	MPA-124	Classifying Numbers in the Real Number System
		HA1-025	Comparing and Ordering Real Numbers
		HA1-030	Using Opposites and Absolute Values
L1.1.2	Explain why the multiplicative inverse of a number has the same sign as the number, while the additive inverse of a number has the opposite sign.	HA1-040	The Addition Rule for Real Numbers
		HA1-045	Subtracting Real Numbers
		HA1-050	Multiplying Real Numbers
		HA1-055	Dividing Real Numbers
		HA1-062	Adding, Subtracting, Multiplying, and Dividing Real Numbers
L1.1.3	Explain how the properties of associativity, commutativity, and distributivity, as well as identity and inverse elements, are used in arithmetic and algebraic calculations.	HA1-085	Simplifying Expressions Using the Properties of Real Numbers
L1.1.4	Describe the reasons for the different effects of multiplication by, or exponentiation of, a positive number by a number less than 0, a number between 0 and 1, and a number greater than 1.	HA1-860	Using the Laws of Exponents
		HA1-065	Evaluating Expressions Containing Exponents
L1.1.5	Justify numerical relationships (e.g., show that the sum of even integers is even; that every integer can be written as $3m+k$, where k is 0, 1, or 2, and m is an integer; or that the sum of the first n positive integers is $n(n+1)/2$).	HA1-130	Identifying Postulates, Theorems, and Properties
		HA1-447	Identifying Number Patterns
L1.2.2	Interpret representations that reflect absolute value relationships (e.g. $ x - a \leq b$, or $a \pm b$) in such contexts as error tolerance.	HA1-887	Applications of Absolute Value, Step, and Constant Functions
		HA1-950	Graphing Absolute Value Functions
		HA1-215	Solving Absolute Value Inequalities
L1.2.4	Organize and summarize a data set in a table, plot, chart, or spreadsheet; find patterns in a display of data; understand and critique data displays in the media.	HA1-447	Identifying Number Patterns
		HA1-448	Finding the n th Term of a Pattern
Standard L2: Calculation, Algorithms, and Estimation			
L2.1.1	Explain the meaning and uses of weighted averages (e.g., GNP, consumer price index, grade point average).	HA1-541	Analyzing Data Using the Measures of Central Tendency and the Range
L2.1.2	Calculate fluently with numerical expressions involving exponents. Use the rules of exponents, and evaluate numerical expressions involving rational and negative exponents, and transition easily between roots and exponents.	HA1-860	Using the Laws of Exponents
		HA1-861	Simplifying Expressions with Negative and Zero Exponents
		HA1-065	Evaluating Expressions Containing Exponents
		HA1-480	Finding the Square Roots of Rational Numbers
		HA1-490	Simplifying Square Roots of Monomials

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L2.1.3	Explain the exponential relationship between a number and its base 10 logarithm and use it to relate rules of logarithms to those of exponents in expressions involving numbers.	HA1-492 HA1-853	Simplifying Square and Cube Roots Applying the Laws of Logarithms
L2.1.4	Know that the complex number i is one of two solutions to $x^2 = -1$.	HA1-910	Complex Numbers
L2.1.5	Add, subtract, and multiply complex numbers. Use conjugates to simplify quotients of complex numbers.	HA1-915	Algebraic Operations with Complex Numbers
L2.1.6	Recognize when exact answers aren't always possible or practical. Use appropriate algorithms to approximate solutions to equations (e.g., to approximate square roots).	MPA-065	Estimating Square Roots
		MPA-133	Distinguishing Between Exact and Approximate Answers
		MPA-134	Calculating with Precision, Accuracy, and Significant Digits
		HA1-536	Solving Quadratic Equations Using the Graphing Calculator
Standard L3: Measurement and Precision			
L3.1.2	Describe and interpret logarithmic relationships in such contexts as the Richter scale, the pH scale, or decibel measurements (e.g., explain why a small change in the scale can represent a large change in intensity). Solve applied problems.	HA1-853	Applying the Laws of Logarithms
		HA1-855	Solving Exponential Equations
Standard A1: Expressions, Equations, and Inequalities			
A1.1.1	Give a verbal description of an expression that is presented in symbolic form, write an algebraic expression from a verbal description, and evaluate expressions given values of the variables.	HA1-005	Evaluating Algebraic Expressions
		HA1-065	Evaluating Expressions Containing Exponents
		HA1-095	Translating Word Phrases into Algebraic Expressions
		HA1-070	Evaluating Formulas for Given Values of the Variables
		HA1-075	Simplifying Algebraic Expressions by Combining Like Terms
		HA1-085	Simplifying Expressions Using the Properties of Real Numbers
		HA1-079	Using a Concrete Model to Simplify Algebraic Expressions
		HA1-090	Simplifying Expressions Using the Property of -1
		HA1-080	Simplifying and Evaluating Algebraic Expressions Containing Grouping Symbols
A1.1.2	Know the definitions and properties of exponents and roots and apply them in algebraic expressions.	HA1-860	Using the Laws of Exponents
		HA1-861	Simplifying Expressions with Negative and Zero Exponents
		HA1-480	Finding the Square Roots of Rational Numbers
		HA1-490	Simplifying Square Roots of Monomials
		HA1-492	Simplifying Square and Cube Roots
A1.1.3	Factor algebraic expressions using, for example, greatest common factor, grouping, and the special product identities (e.g., differences of squares and cubes).	HA1-270	Factoring the Greatest Common Monomial Factor from a Polynomial
		HA1-271	Factoring Trinomials and the Differences of Squares Using Algebra Tiles
		HA1-275	Factoring the Difference Between Two Squares and Perfect Square Trinomials
		HA1-276	Factoring Sums and Differences of Cubes
		HA1-280	Factoring $x^2 + bx + c$ When c is Greater Than Zero
		HA1-285	Factoring $x^2 + bx + c$ When c is Less Than Zero
		HA1-290	Factoring $ax^2 + bx + c$
		HA1-291	Factoring Quadratic Equations Using the Graphing Calculator
		HA1-295	Factoring by Removing a Common Factor and Grouping
		HA1-300	Factoring a Polynomial Completely

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A1.1.6	Use the properties of exponents and logarithms, including the inverse relationship between exponents and logarithms, to transform exponential and logarithmic expressions into equivalent forms.	HA1-856	Translating Exponential and Logarithmic Equations
A1.2.1	Write and solve equations and inequalities with one or two variables to represent mathematical or applied situations.	HA1-104	Translating Word Statements into Equations
		HA1-115	Using the Addition and Subtraction Properties for Equations
		HA1-120	Using the Multiplication and Division Properties for Equations
		HA1-124	Using a Concrete Model to Solve One- and Two-Step Equations
		HA1-125	Solving Equations Using More Than One Property
		HA1-140	Solving Equations by Combining Like Terms
		HA1-144	Using a Concrete Model to Solve Equations with Variables on Both Sides
		HA1-145	Solving Equations with Variables on Both Sides
		HA1-382	Solving Linear Equations Using the Graphing Calculator
		HA1-150	Writing an Equation to Solve Word Problems
		HA1-155	Writing an Equation to Solve Consecutive Integer Problems
		HA1-160	Writing an Equation to Solve Distance, Rate, and Time Problems
		HA1-165	Using Equations to Solve Percent Problems
		HA1-170	Solving Percent of Change Problems
		HA1-135	Evaluating Formulas
		HA1-105	Translating Word Statements into Inequalities
		HA1-180	Graphing Equations and Inequalities on the Number Line
		HA1-185	Solving Inequalities Using the Addition and Subtraction Properties
		HA1-190	Solving Inequalities Using the Multiplication and Division Properties
		HA1-195	Solving Inequalities Using More Than One Property
		HA1-200	Combined Inequalities
		HA1-205	Solving Combined Inequalities
A1.2.2	Associate a given equation with a function whose zeros are the solutions of the equation.	HA1-436	Identifying Relations
		HA1-437	Identifying Relations as Functions
		HA1-955	Analyzing Linear Functions
		HA1-935	Analyzing Graphs of Quadratic Functions
A1.2.3	Solve linear and quadratic equations and inequalities, including systems of up to three linear equations with three unknowns. Justify steps in the solutions, and apply the quadratic formula appropriately.	HA1-104	Translating Word Statements into Equations
		HA1-115	Using the Addition and Subtraction Properties for Equations
		HA1-120	Using the Multiplication and Division Properties for Equations
		HA1-124	Using a Concrete Model to Solve One- and Two-Step Equations
		HA1-125	Solving Equations Using More Than One Property
		HA1-185	Solving Inequalities Using the Addition and Subtraction Properties
		HA1-190	Solving Inequalities Using the Multiplication and Division Properties
		HA1-195	Solving Inequalities Using More Than One Property
		HA1-200	Combined Inequalities
		HA1-205	Solving Combined Inequalities
		HA1-305	Solving Polynomial Equations by Factoring
		HA1-525	Solving Quadratic Equations Involving Perfect Square Expressions
		HA1-530	Solving Quadratic Equations by Completing the Square
		HA1-535	Developing the Quadratic Formula and Using it to Solve Equations
		HA1-536	Solving Quadratic Equations Using the Graphing Calculator
		HA1-455	Solving Systems of Linear Equations by Graphing
		HA1-460	Solving Systems of Linear Equations by the Substitution Method
		HA1-465	Solving Systems of Linear Equations by the Addition/Subtraction Method

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		HA1-470	Solving Systems of Linear Equations by the Multiply/Add/Subtract Method
		HA1-806	Solving Systems of Linear Equations Using the Graphing Calculator
		HA1-475	Graphing the Solution Set of a System of Linear Inequalities
		HA1-870	Solving Problems with Systems of Linear Equations and Inequalities
		HA1-852	Solving Systems of Linear Equations in Three Variables Using the Gauss-Jordan Method
A1.2.4	Solve absolute value equations and inequalities (e.g., solve $ x - 3 \leq 6$) and justify.	HA1-210	Solving Equations Involving Absolute Value
		HA1-215	Solving Absolute Value Inequalities
A1.2.6	Solve power equations (e.g., $(x + 1)^3 = 8$) and equations including radical expressions (e.g., $3x - 7 = 7$), justify steps in the solution, and explain how extraneous solutions may arise.	HA1-510	Solving Radical Equations
A1.2.8	Solve an equation involving several variables (with numerical or letter coefficients) for a designated variable. Justify steps in the solution.	HA1-175	Solving Literal Equations
Standard A2: Functions			
A2.1.1	Recognize whether a relationship (given in contextual, symbolic, tabular, or graphical form) is a function and identify its domain and range.	HA1-436	Identifying Relations
		HA1-437	Identifying Relations as Functions
		HA1-438	Finding the Domain and Range of Functions
A2.1.2	Read, interpret, and use function notation and evaluate a function at a value in its domain.	HA1-439	Using Function Notation
A2.1.3	Represent functions in symbols, graphs, tables, diagrams, or words and translate among representations.	HA1-402	Translating Among Multiple Representations of Functions
A2.1.4	Recognize that functions may be defined by different expressions over different intervals of their domains. Such functions are piecewise-defined (e.g., absolute value and greatest integer functions).	HA1-950	Graphing Absolute Value Functions
		HA1-887	Applications of Absolute Value, Step, and Constant Functions
A2.1.5	Recognize that functions may be defined recursively. Compute values of and graph simple recursively defined functions (e.g., $f(0) = 5$, and $f(n) = f(n-1) + 2$).	HA1-439	Using Function Notation
A2.1.6	Identify the zeros of a function and the intervals where the values of a function are positive or negative. Describe the behavior of a function as x approaches positive or negative infinity, given the symbolic and graphical representations.	HA1-935	Analyzing Graphs of Quadratic Functions
		HA1-536	Solving Quadratic Equations Using the Graphing Calculator
A2.1.7	Identify and interpret the key features of a function from its graph or its formula(e), (e.g., slope, intercept(s), asymptote(s), maximum and minimum value(s), symmetry, and average rate of change over an interval).	HA1-380	Graphing Linear Equations
		HA1-385	Finding the Slope of a Line from its Graph or from the Coordinates of Two Points
		HA1-395	Finding the Equation of a Line Parallel or Perpendicular to a Given Line
		HA1-398	Graphing Linear Equations Using Slope and y-Intercept or Slope and a Point
		HA1-935	Analyzing Graphs of Quadratic Functions
A2.2.1	Combine functions by addition, subtraction, multiplication, and division.	HA2-446	Performing Operations with Functions
A2.2.2	Apply given transformations (e.g., vertical or horizontal shifts, stretching or shrinking, or reflections about the x - and y -axes) to basic functions and represent symbolically.	HA1-401	How Variations of "m" and "b" Affect the Graph of $y = mx + b$
		HA1-927	Graphing $f(x) = ax^2$ Using Dilations
		HA1-928	Graphing $f(x) = ax^2$ Using Dilations and Reflections
		HA1-929	Graphing $f(x) = ax^2 + c$ Using Dilations, Reflections, and Vertical Translations
A2.2.3	Recognize whether a function (given in tabular or graphical form) has an inverse and recognize simple inverse pairs (e.g., $f(x) = x^3$ and $g(x) = x^{1/3}$).	HA2-443	Finding the Inverses of Linear and Quadratic Functions
A2.3.1	Identify a function as a member of a family of functions based on its symbolic or graphical representation. Recognize that different families of functions have different asymptotic behavior at infinity and describe these behaviors.	HA1-401	How Variations of "m" and "b" Affect the Graph of $y = mx + b$
		HA1-927	Graphing $f(x) = ax^2$ Using Dilations
		HA1-928	Graphing $f(x) = ax^2$ Using Dilations and Reflections

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		HA1-929	Graphing $f(x) = ax^2 + c$ Using Dilations, Reflections, and Vertical Translations
A2.3.2	Describe the tabular pattern associated with functions having constant rate of change (linear) or variable rates of change.	HA1-380	Graphing Linear Equations
		HA1-441	Applications of Functions and Relations Involving Distance, Rate, and Time
		HA1-442	Interpreting Graphs of Functions in Real-Life Situations
		HA1-955	Analyzing Linear Functions
		HA1-447	Identifying Number Patterns
A2.4.1	Write the symbolic forms of linear functions (standard [i.e., $Ax + By = C$, where $B \neq 0$], point-slope, and slope-intercept) given appropriate information and convert between forms.	HA1-394	Interchanging Linear Equations Between Standard Form and Slope-Intercept Form
A2.4.2	Graph lines (including those of the form $x = h$ and $y = k$) given appropriate information.	HA1-380	Graphing Linear Equations
A2.4.3	Relate the coefficients in a linear function to the slope and x- and y-intercepts of its graph.	HA1-385	Finding the Slope of a Line from its Graph or from the Coordinates of Two Points
		HA1-394	Interchanging Linear Equations Between Standard Form and Slope-Intercept Form
		HA1-395	Finding the Equation of a Line Parallel or Perpendicular to a Given Line
		HA1-398	Graphing Linear Equations Using Slope and y-Intercept or Slope and a Point
A2.4.4	Find an equation of the line parallel or perpendicular to given line through a given point. Understand and use the facts that nonvertical parallel lines have equal slopes and that nonvertical perpendicular lines have slopes that multiply to give -1 .	HA1-395	Finding the Equation of a Line Parallel or Perpendicular to a Given Line
A2.5.1	Write the symbolic form and sketch the graph of an exponential function given appropriate information (e.g., given an initial value of 4 and a rate of growth of 1.5, write $f(x) = 4(1.5)^x$).	HA1-820	Graphing Exponential Functions (Future Release)
		HA1-825	Exponential Growth and Decay (Future Release)
A2.5.4	Understand and use the fact that the base of an exponential function determines whether the function increases or decreases and how base affects the rate of growth or decay.	HA1-820	Graphing Exponential Functions (Future Release)
		HA1-825	Exponential Growth and Decay (Future Release)
A2.5.5	Relate exponential and logarithmic functions to real phenomena, including half-life and doubling time.	HA1-825	Exponential Growth and Decay (Future Release)
		HA1-855	Solving Exponential Equations
		HA1-857	Solving Logarithmic Equations
A2.6.1	Write the symbolic form and sketch the graph of a quadratic function given appropriate information (e.g., vertex, intercepts, etc.).	HA1-935	Analyzing Graphs of Quadratic Functions
A2.6.2	Identify the elements of a parabola (vertex, axis of symmetry, and direction of opening) given its symbolic form or its graph and relate these elements to the coefficient(s) of the symbolic form of the function.	HA1-935	Analyzing Graphs of Quadratic Functions
		HA1-927	Graphing $f(x) = ax^2$ Using Dilations
		HA1-928	Graphing $f(x) = ax^2$ Using Dilations and Reflections
A2.6.3	Convert quadratic functions from standard to vertex form by completing the square.	HA1-530	Solving Quadratic Equations by Completing the Square
A2.6.4	Relate the number of real solutions of a quadratic equation to the graph of the associated quadratic function.	HA1-905	Quadratic Equations with Irrational Roots
		HA1-925	Using the Discriminant to Analyze the Solution of a Quadratic Equation
A2.6.5	Express quadratic functions in vertex form to identify their maxima or minima and in factored form to identify their zeros.	HA1-536	Solving Quadratic Equations Using the Graphing Calculator
		HA1-805	Applying Algebra Concepts
		HA1-945	Real-World Applications of Quadratic Functions
A2.7.1	Write the symbolic form and sketch the graph of power functions.	HA1-820	Graphing Exponential Functions (Future Release)
A2.7.2	Express direct and inverse relationships as functions (e.g., $y = kx^n$ and $y = kx^{-n}$, $n > 0$) and recognize their characteristics (e.g., in $y = x^8$, note that doubling x results in multiplying y by a factor of 8).	HA1-820	Graphing Exponential Functions (Future Release)

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A2.7.3	Analyze the graphs of power functions, noting reflectional or rotational symmetry.	HA1-820	Graphing Exponential Functions (Future Release)
A2.8.1	Write the symbolic form and sketch the graph of simple polynomial functions.	HA1-820	Graphing Exponential Functions (Future Release)
A2.8.2	Understand the effects of degree, leading coefficient, and number of real zeros on the graphs of polynomial functions of degree greater than 2.	MPA-150	Identifying and Graphing Linear and Nonlinear Functions
A2.8.3	Determine the maximum possible number of zeroes of a polynomial function and understand the relationship between the x-intercepts of the graph and the factored form of the function.	HA1-935	Analyzing Graphs of Quadratic Functions
		HA1-536	Solving Quadratic Equations Using the Graphing Calculator
Standard A3: Mathematical Modeling			
A3.1.1	Identify the family of function best suited for modeling a given real-world situation [e.g., quadratic functions for motion of an object under the force of gravity or exponential functions for compound interest. In the example above, recognize that the appropriate general function is exponential ($P = P_0at$)].	HA1-945	Real-World Applications of Quadratic Functions
		HA1-940	Applications of Quadratic Equations
		HA1-820	Graphing Exponential Functions (Future Release)
A3.1.2	Adapt the general symbolic form of a function to one that fits the specifications of a given situation by using the information to replace arbitrary constants with numbers. In the example above, substitute the given values $P_0 = 300$ and $a = 1.02$ to obtain $P = 300(1.02)^t$.	HA1-825	Exponential Growth and Decay (Future Release)
A3.1.3	Using the adapted general symbolic form, draw reasonable conclusions about the situation being modeled. In the example above, the exact solution is 365.698, but for this problem, an appropriate approximation is 365.	HA1-825	Exponential Growth and Decay (Future Release)
		HA1-855	Solving Exponential Equations
*A3.1.4	Use methods of linear programming to represent and solve simple real-life problems.	HA1-945	Real-World Applications of Quadratic Functions
Standard S2: Bivariate Data-Examining Relationships			
S2.1.1	Construct a scatterplot for a bivariate data set with appropriate labels and scales.	MPA-132	Interpreting and Creating Scatterplots
		HA1-892	Data Analysis Using the Graphing Calculator
S2.1.2	Given a scatterplot, identify patterns, clusters, and outliers. Recognize no correlation, weak correlation, and strong correlation.	HA1-965	Determining the Best-Fitting Line
S2.1.3	Estimate and interpret Pearson's correlation coefficient for a scatterplot of a bivariate data set. Recognize that correlation measures the strength of linear association.	HA1-965	Determining the Best-Fitting Line
S2.1.4	Differentiate between correlation and causation. Know that a strong correlation does not imply a cause-and-effect relationship. Recognize the role of lurking variables in correlation.	HA1-965	Determining the Best-Fitting Line
S2.2.1	For bivariate data that appear to form a linear pattern, find the least squares regression line by estimating visually and by calculating the equation of the regression line. Interpret the slope of the equation for a regression line.	HA1-965	Determining the Best-Fitting Line
		HA1-892	Data Analysis Using the Graphing Calculator
		HA1-877	Drawing Inferences and Making Predictions from Tables and Graphs
S2.2.2	Use the equation of the least squares regression line to make appropriate predictions.	HA1-965	Determining the Best-Fitting Line

MM1-Fundamentals of Mathematics

MPA- Pre-Algebra

HA1-Algebra 1

Note: Standards were taken from the Michigan Merit Curriculum for Algebra 1 Version 8.06 for Michigan Department of Education - Course requirements document adopted by the Michigan State Board of Education in 2006.