



Alignment Document

State of Georgia And Aventa Learning Pre-Algebra

Pre-Algebra 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
MM1	Mathematics 1		
MM1A	Students will explore functions and solve simple equations. Students will simplify and operate with radical, polynomial, and rational expressions.		
MM1A1	Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.		
MM1A1.a	Represent functions using function notation.		
MM1A1.b	Graph the basic functions $f(x) = x$ to the n power, where $n = 1$ to 3 , $f(x) =$ square root of x , $f(x) = x $, and $f(x) = 1/x$.		
MM1A1.c	Graph transformations of basic functions including vertical shifts, stretches, and shrinks, as well as reflections across the x - and y -axes.		
MM1A1.d	Investigate and explain the characteristics of a function: domain, range, zeros, intercepts, intervals of increase and decrease, maximum and minimum values, and end behavior.		
MM1A1.e	Relate to a given context the characteristics of a function, and use graphs and tables to investigate its behavior.		

MM1A1.f	Recognize sequences as functions with domains that are whole numbers.		
MM1A1.g	Explore rates of change, comparing constant rates of change (i.e., slope) versus variable rates of change. Compare rates of change of linear, quadratic, square root, and other function families.		
MM1A1.h	Determine graphically and algebraically whether a function has symmetry and whether it is even, odd, or neither.		
MM1A1.i	Understand that any equation in x can be interpreted as the equation $f(x) = g(x)$, and interpret the solutions of the equation as the x -value(s) of the intersection point(s) of the graphs of $y = f(x)$ and $y = g(x)$.		
MM1A2	Students will simplify and operate with radical expressions, polynomials, and rational expressions.	Polynomials	Evaluating Polynomials
		Polynomials	Adding and Subtracting
		Polynomials	Multiplying
MM1A2.a	Simplify algebraic and numeric expressions involving square root.	Factoring and Geometric Formulas	Geometric Formula
MM1A2.b	Perform operations with square roots.		
MM1A2.c	Add, subtract, multiply, and divide polynomials.	Polynomials	Adding and Subtraction
		Polynomials	Multiplying
MM1A2.d	Expand binomials using the Binomial Theorem.	Polynomials	Multiplying
MM1A2.e	Factor expressions by greatest common factor, grouping, trial and error, and special products limited to the formulas below.	Factoring and Geometric Formulas	Factoring
MM1A2.f.1	$(x + y)^2 = x^2 + 2xy + y^2$		
MM1A2.f.2	$(x - y)^2 = x^2 - 2xy + y^2$		
MM1A2.f.3	$(x + y)(x - y) = x^2 - y^2$		
MM1A2.f.4	$(x + a)(x + b) = x^2 + (a + b)x + ab$		

MM1A2.f.5	$(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$		
MM1A2.f.6	$(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$		
MM1A2.f	Use area and volume models for polynomial arithmetic.		
MM1A3	Students will solve simple equations.	Equations	Solving Simple Equations
MM1A3.a	Solve quadratic equations in the form $ax^2 + bx + c = 0$ where $a = 1$ by using factorization and finding square roots where applicable.		
MM1A3.b	Solve equations involving radicals such as square root of $x + b = c$, using algebraic techniques.	Factoring and Geometric Formulas	Geometric Formula
MM1A3.c	Use a variety of techniques, including technology, tables and graphs to solve equations resulting from the investigation of $x^2 + bx + c = 0$.		
MM1A3.d	Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.		
MM1G	Students will explore, understand, and use the formal language of reasoning and justification. Students will apply properties of polygons, and determine distances and points of concurrence.		
MM1G1	Students will investigate properties of geometric figures in the coordinate plane.		
MM1G1.a	Determine the distance between two points.		
MM1G1.b	Determine the distance between a point and a line.		
MM1G1.c	Determine the midpoint of a segment.		
MM1G1.d	Understand the distance formula as an application of the Pythagorean theorem.		
MM1G1.e	Use the coordinate plane to investigate properties of and verify conjectures related to triangles and quadrilaterals.		

MM1G2	Students will understand and use the language of mathematical argument and justification.	Number Basics	Rounding
		Equations	Linear Equations
MM1G2.a	Use conjecture, inductive reasoning, deductive reasoning, counterexamples, and indirect proof as appropriate.		
MM1G2.b	Understand and use the relationships among a statement and its converse, inverse, and contrapositive.		
MM1G3	Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.	Factoring and Geometric Formulas	Geometric Formula
MM1G3.a	Determine the sum of interior and exterior angles in a polygon.		
MM1G3.b	Understand and use the triangle inequality, the side-angle inequality, and the exterior-angle inequality.		
MM1G3.c	Understand and use congruence postulates and theorems for triangles (SSS, SAS, ASA, AAS, HL).		
MM1G3.d	Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.		
MM1G3.e	Find and use points of concurrency in triangles: incenter, orthocenter, circumcenter, and centroid.		
MM1D	Students will use counting techniques and determine probability. Students will demonstrate understanding of data analysis by posing questions to be answered by collecting data. Students will organize, represent, investigate, interpret, and make inferences from data.		
MM1D1	Students will determine the number of outcomes related to a given event	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects



MM1D1.a	Apply the addition and multiplication principles of counting.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D1.b	Calculate and use simple permutations and combinations.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D2	Students will use the basic laws of probability	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D2.a	Find the probabilities of mutually exclusive events.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D2.b	Find the probabilities of dependent events.		
MM1D2.c	Calculate conditional probabilities.		
MM1D2.d	Use expected value to predict outcomes.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D3	Students will relate samples to a population.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D3.a	Compare summary statistics (mean, median, quartiles, and interquartile range) from one sample data distribution to another sample data distribution in describing center and variability of the data distributions.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects
MM1D3.b	Compare the averages of the summary statistics from a large number of samples to the corresponding population parameters.		
MM1D3.c	Understand that a random sample is used to improve the chance of selecting a representative sample.	Probability and Data Analysis	Probability
		Probability and Data Analysis	Data Analysis Projects

MM1D4	Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).		
MM1P	The following process standards are essential to mastering each of the mathematics content standards. They emphasize critical dimensions of the mathematical proficiency that all students need.		
MM1P1	Students will solve problems (using appropriate technology).		
MM1P1.a	Build new mathematical knowledge through problem solving.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Multiplying
		Decimals and Percents	Decimals
MM1P1.b	Solve problems that arise in mathematics and in other contexts.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Decimals and Percents	Fraction Basics
		Fractions	Adding and Subtracting
MM1P1.c	Apply and adapt a variety of appropriate strategies to solve problems.	Word Problems	Strategies
		Number Basics	Rounding
		Decimals and Percents	Percents
		Decimals and Percents	Fraction Basics
		Fractions	Multiplying and Dividing
MM1P1.d	Monitor and reflect on the process of mathematical problem solving.	Factoring and Geometric Formulas	Factoring
		Polynomials	Multiplying
		Number Basics	Significant Digits
		Basics	Integer Math



MM1P2	Students will reason and evaluate mathematical arguments.	Factoring and Geometric Formulas	Factoring
		Polynomials	Multiplying
		Word Problems	Translating English to Math
		Decimals and Percents	Decimals
		Basics	Integer Math
MM1P2.a	Recognize reasoning and proof as fundamental aspects of mathematics.		
MM1P2.b	Make and investigate mathematical conjectures.		
MM1P2.c	Develop and evaluate mathematical arguments and proofs.		
MM1P2.d	Select and use various types of reasoning and methods of proof.		
MM1P3	Students will communicate mathematically.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1P3.a	Organize and consolidate their mathematical thinking through communication.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing



		Basics	Integer Math
MM1P3.b	Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1P3.c	Analyze and evaluate the mathematical thinking and strategies of others.		
MM1P3.d	Use the language of mathematics to express mathematical ideas precisely.	Factoring and Geometric Formulas	Factoring
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1P4	Students will make connections among mathematical ideas and to other disciplines.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Decimals and Percents	Decimals
		Decimals and Percents	Percents



MM1P4.a	Recognize and use connections among mathematical ideas.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
MM1P4.b	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
MM1P4.c	Recognize and apply mathematics in contexts outside of mathematics.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding,
		Word Problems	Translating English to Math
		Word Problems	Strategies
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
MM1.MRC	Students will enhance reading in all curriculum areas by:		
MM1.MRC.a	Reading in all curriculum areas	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Adding and Subtracting



MM1.MRC.a.	Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas		
MM1.MRC.a.	Read both informational and fictional texts in a variety of genres and modes of discourse		
MM1.MRC.a.	Read technical texts related to various subject areas	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding
		Word Problems	Translating English to Math
		Word Problems	Strategies
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
MM1.MRC.b	Discussing books		
MM1.MRC.b.	Discuss messages and themes from books in all subject areas.		
MM1.MRC.b.	Respond to a variety of texts in multiple modes of discourse.	Factoring and Geometric Formulas	Factoring
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.b.	Relate messages and themes from one subject area to messages and themes in another area.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding



		Word Problems	Translating English to Math
		Word Problems	Strategies
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
MM1.MRC.b.	Evaluate the merit of texts in every subject discipline.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.b.	Examine author's purpose in writing.		
MM1.MRC.b.	Recognize the features of disciplinary texts.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.c	Building vocabulary knowledge	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits



		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.c.	Demonstrate an understanding of contextual vocabulary in various subjects.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.c.	Use content vocabulary in writing and speaking.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.c.	Explore understanding of new words found in subject area texts.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals



		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.d	Establishing context	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.d.	Explore life experiences related to subject area content.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Factoring and Geometric Formulas	Geometric Formulas
		Number Basics	Rounding
		Word Problems	Translating English to Math
		Word Problems	Strategies
		Decimals and Percents	Decimals
		Decimals and Percents	Percents
		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
MM1.MRC.d.	Discuss in both writing and speaking how certain words are subject area related.	Equations	Linear Equations
		Probability and Data Analysis	Data Analysis Projects
		Polynomials	Definitions
		Polynomials	Multiplying
		Number Basics	Rounding
		Number Basics	Significant Digits
		Decimals and Percents	Decimals
		Decimals and Percents	Percents



		Fractions	Fraction Basics
		Fractions	Multiplying and Dividing
		Basics	Integer Math
MM1.MRC.d.	Determine strategies for finding content and contextual meaning for unknown words.	Word Problems	Translating English to Math