

**Georgia State Core Curriculum**  
**Standards adopted 2009**  
**Mathematics 1**

Strand	Heading	Reference	Description	High School Algebra Boardworks presentations
	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.	
			a. Represent functions using function notation.	Function notation Functions and relations
			b. Graph the basic functions $f(x) = x^n$ , where $n = 1$ to $3$ , $f(x) = x$ , $f(x) =  x $ , and $f(x) = 1/x$	Graphs of important non-linear functions Plotting and sketching graphs Absolute value functions
			c. Graph transformations of basic functions including vertical shifts, stretches, and shrinks, as well as reflections across the x- and y- axes.	Transforming functions part 1 Transforming functions part 2
			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.	Functions and relations Domain, range and composite functions Plotting and sketching graphs
			e. Relate to a given context the characteristics of a function, and use graphs and tables to investigate its behavior.	Graphs of important non-linear functions Plotting and sketching graphs
			f. Recognize sequences as functions with domains that are whole numbers.	Sequences and rules Arithmetic sequences Geometric sequences
			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.	Slopes and intercepts
			h. Determine graphically and algebraically whether a function has symmetry and whether it is even, odd, or neither.	Even, odd and periodic functions

Algebra

	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 $y = g(x)$ .	Function notation Using graphs to solve equations
MM1A2	Students will simplify and operate with radical expressions, polynomials, and rational expressions.	
	a. Simplify algebraic and numeric expressions involving square root.	Manipulating formulas Radicals Manipulating radicals
	b. Perform operations with square roots.	Radicals Manipulating radicals
	c. Add, subtract, multiply, and divide polynomials.	Operations with polynomials Dividing polynomials The factor theorem
	d. Expand binomials using the Binomial Theorem.	Binomial coefficients
	e. Add, subtract, multiply, and divide rational expressions.	Simplifying rational functions Operations with algebraic fractions Improper fractions
	f. Factor expressions by greatest common factor, grouping, trial and error, and special products limited to the formulas below.	The distributive property Factoring quadratic expressions Multiplying parentheses
	$(x + y)^2 = x^2 + 2xy + y^2$	Factoring quadratic expressions
	$(x - y)^2 = x^2 - 2xy + y^2$	The distributive property
	$(x + y)(x - y) = x^2 - y^2$	Factoring quadratic expressions
	$(x + a)(x + b) = x^2 + (a + b)x + ab$	Factoring quadratic expressions The distributive property
	$(x + y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$	Multiplying parentheses
	$(x - y)^3 = x^3 - 3x^2y + 3xy^2 - y^3$	Multiplying parentheses
	g. Use area and volume models for polynomial arithmetic.	-
MM1A3	Students will solve simple equations.	
	a. Solve quadratic equations in the form $ax^2 + bx + c = 0$ , where $a = 1$ , by using factorization and finding square roots where applicable.	Factoring Factoring quadratic expressions Quadratic equations and factoring Solving quadratic equations

			b. Solve equations involving radicals such as $\sqrt{x + b} = c$ , using algebraic techniques.	Manipulating formulas Radicals Manipulating radicals
			c. Use a variety of techniques, including technology, tables, and graphs to solve equations resulting from the investigation of $x^2 + bx + c = 0$	Solving quadratic equations Graphs of quadratic functions
			d. Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.	Algebraic fractions Equations involving algebraic fractions
<b>Data analysis and probability</b>	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.	
			a. Apply the addition and multiplication principles of counting.	Introduction to probability Permutations Combinations
			b. Calculate and use simple permutations and combinations.	Introduction to probability Permutations Combinations
		MM1D2	Students will use the basic laws of probability.	
			a. Find the probabilities of mutually exclusive events.	Introduction to probability Combined events part 1 Combined events part 2
			b. Find the probabilities of dependent events.	Dependent events
			c. Calculate conditional probabilities.	Probabilities from tables and Venn diagrams Probability notation
			d. Use expected value to predict outcomes.	Probability from experiments
		MM1D3	Students will relate samples to a population.	
			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.	The mode The mean The median Which measure of central tendency? The range and interquartile range Standard deviation
b. Compare the averages of the summary statistics from a large number of samples to the corresponding population parameters.	Methods of sampling part 1 Methods of sampling part 2			

		c. Understand that a random sample is used to improve the chance of selecting a representative sample.	Methods of sampling part 1 Methods of sampling part 2
	MM1D4	Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).	Standard deviation