Mathematics I

State Standard Number	State Standard Area/Description	Course Name/Unit Name	Course Topic Description
MM1A	Students will explore functions and solve simple equations. Students will simplify and operate with radical, polynomial, and rational expressions.	Introduction to Functions/Graphing Functions	Throughout Units
MM1A1	Students will explore and interpret the characteristics of functions, using graphs, tables, and simple algebraic techniques.	Introduction to Functions/Graphing Functions	Throughout Units
MM1A1.a	Represent functions using function notation.	Introduction to Functions	Section B
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.	Graphing Functions	Section A
MM1A1.c	Graph transformations of basic functions including vertical shifts, stretches, and shrinks, as well as reflections across the x- and y-axes.	Graphing Functions	Section B
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.	Introduction to Functions	Section A
MM1A1.f	Recognize sequences as functions with domains that are whole numbers.	Introduction to Functions	Section A
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.		

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MM1A1.h	Determine graphically and algebraically whether a function has symmetry and whether it is even, odd, or neither.	Graphing Functions	Section C
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.	Throughout Course	
MM1A2.a	Simplify algebraic and numeric expressions involving square root.	Radical Functions	Section A
MM1A2.a	Simplify algebraic and numeric expressions involving square root.	Radical Functions	Section A
MM1A2.b	Perform operations with square roots.	Radical Functions	Section B
MM1A2.c	Add, subtract, multiply, and divide polynomials.	Operations with Polynomial Functions	Sections A and B

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MM1A2.d	Expand binomials using the Binomial Theorem.	Statistics	Section C
MM1A2.e	Add, subtract, multiply, and divide rational expressions.	Rational Functions	Sections A and B
MM1A2.f	Factor expressions by greatest common factor, grouping, trial and error, and special products limited to the formulas below. $(x + y)^2 = x^2 + 2xy + y^2$; $(x - y)^2 = x^2 - 2xy + y^2$; $(x + y)(x - y) = x^2 - y^2$; $(x + a)(x + b) = x^2 + (a + b)x + ab$; $(x + y)^3 = x^3 +3x^2y + 3xy^2 + y^3$; $(x - y)^3 = x^3 -3x^2y + 3xy^2 - y^3$	Linear, Quadratic and Polynomial Functions	Section B
MM1A2.g	Use area and volume models for polynomial arithmetic.	Operations with Polynomial Functions	Section A
MM1A3	Students will solve simple equations.	Throughout Course	
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.	Linear, Quadratic and Polynomial Functions	Section C
MM1A3.b	Solve equations involving radicals such as square root of $x + b = c$, using algebraic techniques.	Linear, Quadratic and Polynomial Functions	Section C

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MM1A3.c	Use a variety of techniques, including technology, tables, and graphs to solve equations resulting from the investigation of $x^2 + bx + c = 0$.	Linear, Quadratic and Polynomial Functions	Section C
MM1A3.d	Solve simple rational equations that result in linear equations or quadratic equations with leading coefficient of 1.	Rational Functions	Section C
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.	Throughout Geometry Units	
MM1G1	Students will investigate properties of geometric figures in the coordinate plane.	Throughout Geometry Units	
MM1G1.a	Determine the distance between two points.	Geometry: Introduction	Section A
MM1G1.b	Determine the distance between a point and a line.	Geometry: Introduction	Section A
MM1G1.c	Determine the midpoint of a segment.	Geometry: Introduction	Section B
MM1G1.d	Understand the distance formula as an application of the Pythagorean theorem.	Geometry: Introduction	Section A

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MM1G1.e	Use the coordinate plane to investigate properties of and verify conjectures related to triangles and quadrilaterals.	Geometric Figures	Journal Assignments
MM1G2	Students will understand and use the language of mathematical argument and justification.	Throughout Course	
MM1G2.a	Use conjecture, inductive reasoning, deductive reasoning, counterexamples, and indirect proof as appropriate.	Geometry: Introduction	Section D
MM1G2.b	Understand and use the relationships among a statement and its converse, inverse, and contrapositive.	Geometry: Introduction	Section D
MM1G3	Students will discover, prove, and apply properties of triangles, quadrilaterals, and other polygons.	Geometry Figures	Through Unit
MM1G3.a	Determine the sum of interior and exterior angles in a polygon.	Geometric Figures	Section A
MM1G3.b	Understand and use the triangle inequality, the side-angle inequality, and the exterior-angle inequality.	Geometric Figures	Section C
MM1G3.c	Understand and use congruence postulates and theorems for triangles (SSS, SAS, ASA, AAS, HL).	Geometric Figures	Section C

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MM1G3.d	Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.	Geometric Figures	Section B
MM1G3.e	Find and use points of concurrency in triangles: incenter, orthocenter, circumcenter, and centroid.	Geometric Figures	Section C
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.	Throughout Probability Unit	
MM1D1	Students will determine the number of outcomes related to a given event.	Throughout Probability Unit	
MM1D1.a	Apply the addition and multiplication principles of counting.	Probability	Section B
MM1D1.b	Calculate and use simple permutations and combinations.	Probability	Section B
MM1D2	Students will use the basic laws of probability.	Throughout Probability Unit	
MM1D2.a	Find the probabilities of mutually exclusive events.	Probability	Section A
MM1D2.b	Find the probabilities of dependent events.	Probability	Section A

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MM1D2.c	Calculate conditional probabilities.	Probability	Section A
MM1D2.d	Use expected value to predict outcomes.	Probability	Sections A and B
MM1D3	Students will relate samples to a population.	Throughout Statistics Unit	
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.	Statistics	Section A
MM1D3.b	Compare the averages of the summary statistics from a large number of samples to the corresponding population parameters.	Statistics	Section B
MM1D3.c	Understand that a random sample is used to improve the chance of selecting a representative sample.	Statistics	Section B
MM1D4	Students will explore variability of data by determining the mean absolute deviation (the average of the absolute values of the deviations).	Statistics	Section A
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.	Throughout Course	
MM1P1	Students will solve problems (using appropriate technology).	Throughout Course	

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MM1P1.a	Build new mathematical knowledge through problem solving.	Introduction to Functions	Section B-Application
MM1P1.b	Solve problems that arise in mathematics and in other contexts.	Introduction to Functions	Section B-Application
MM1P1.c	Apply and adapt a variety of appropriate strategies to solve problems.	Introduction to Functions	Section C: Think and Click-Operations on Functions to Real World Situations
MM1P1.d	Monitor and reflect on the process of mathematical problem solving.	Introduction to Functions	Section C: Think and Click-Operations on Functions to Real World Situations
MM1P2	Students will reason and evaluate mathematical arguments.	Geometry: Introduction	Section C
MM1P2.a	Recognize reasoning and proof as fundamental aspects of mathematics.	Geometry: Introduction	Section C
MM1P2.b	Make and investigate mathematical conjectures.	Geometry: Introduction	Section C

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MM1P2.c	Develop and evaluate mathematical arguments and proofs.	Geometry: Introduction	Section C
MM1P2.d	Select and use various types of reasoning and methods of proof.	Geometry: Introduction	Section C
MM1P3	Students will communicate mathematically.	Throughout Course	Assignments
MM1P3.a	Organize and consolidate their mathematical thinking through communication.	Throughout Course	Assignments
MM1P3.b	Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Throughout Course	Assignments
MM1P3.c	Analyze and evaluate the mathematical thinking and strategies of others.	Throughout Course	Assignments
MM1P3.d	Use the language of mathematics to express mathematical ideas precisely.	Throughout Course	Assignments
MM1P4	Students will make connections among mathematical ideas and to other disciplines.	Throughout Course	Real World Applications

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MM1P4.a	Recognize and use connections among mathematical ideas.	Throughout Course	Assignments
MM1P4.b	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Throughout Course	Assignments
MM1P4.c	Recognize and apply mathematics in contexts outside of mathematics.	Throughout Course	Real World Applications
MMIP5	Students will represent mathematics in multiple ways.	Throughout Course	Assignments
MMIP5.a	Create and use representations to organize, record, and communicate mathematical ideas.	Throughout Course	Assignments
MMIP5.b	Select, apply, and translate among mathematical representations to solve problems.	Throughout Course	Real World Applications
MMIP5.c	Use representations to model and interpret physical, social, and mathematical phenomena.	Throughout Course	Real World Applications
MRC	Students will enhance reading in all curriculum areas by:		

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MRC.a	Reading in all curriculum areas		
MRC.a.1	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		
MRC.a.2	Read both informational and fictional texts in a variety of genres and modes of discourse		
MRC.a.3	Read technical texts related to various subject areas		
MRC.b	Discussing books		
MRC.b.1	Discuss messages and themes from books in all subject areas.		
MRC.b.2	Respond to a variety of texts in multiple modes of discourse.		
MRC.b.3	Relate messages and themes from one subject area to messages and themes in another area.		

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MRC.b.4	Evaluate the merit of texts in every subject discipline.		
MRC.b.5	Examine author's purpose in writing.		
MRC.b.6	Recognize the features of disciplinary texts.		
MRC.c	Building vocabulary knowledge	Throughout Course	Vocabulary Lists
MRC.c.1	Demonstrate an understanding of contextual vocabulary in various subjects.	Throughout Course	Vocabulary Lists
MRC.c.2	Use content vocabulary in writing and speaking.	Throughout Course	Vocabulary Lists
MRC.c.3	Explore understanding of new words found in subject area texts.	Throughout Course	Vocabulary Lists
MRC.d	Establishing context	Throughout Course	Vocabulary Lists

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MRC.d.1	Explore life experiences related to subject area content.	Throughout Course	Real World Applications
MRC.d.2	Discuss in both writing and speaking how certain words are subject area related.		
MRC.d.3	Determine strategies for finding content and contextual meaning for unknown words.	Throughout Course	Vocabulary Lists