OPERATIONS WITH REAL NUMBERS	Standard	Core Concepts	Key terms	examples
MA.A1.1.1	Compare real number expressions.	• Mathematicians look for patterns and represent them with rules • In order to evaluate numerical expressions, you must use order of operations	• Commutative property • Associative property • Distributive property	
MA.A1.1.2	Simplify square roots using factors.	• Rational numbers can be written in different forms • A perfect square is the product of a rational number multiplied by itself	• Radical • Factor • Square root • Radicand • Irrational numbers	

OPERATIONS WITH REAL NUMBERS	Standard	Core Concepts	Key terms	examples
MA.A1.1.3	Understand and use the distributive, associative, and commutative properties.	• You can use the commutative, associative, and distributive properties to evaluate expressions • Commutative and associative properties are used to evaluate expressions by rearranging and simplifying • The distributive property provides a process to handle variables in parentheses	• variables	
MA.A1.1.4	Use the laws of exponents for rational numbers.	• Rules of exponents are applied to simplify expressions and equations • Equivalent expressions and equations can be generated	• Exponent • Base	

OPERATIONS WITH REAL NUMBERS	Standard	Core Concepts	Key terms	examples
MA.A1.1.5	Use dimensional (unit) analysis to organize conversions and computations.	• Rates are ratios of two quantities with different rates • You can use ratios to find equivalent rates and unit rates • Unit rates are useful for comparisons • Cross-products can be used to solve proportions	• Ratio • Rate • Cross-products	

LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.2.1	Solve linear equations.	• Linear functions represent situations with a constant rate of change • Many real-world functional relationships can be represented by equations	• Slope • X-intercept • Y-intercept	
MA.A1.2.2	Solve equations and formulas for a specified variable.	• In order to evaluate numerical expressions, you must use order of operations • Inverse operations are used to simplify equations	• Transforming equations	

LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.2.3	Find solution sets of linear inequalities when possible numbers are given for a variable.	• Many real-world situations can be represented using linear models • Lines have specific properties that relate to information about the situation represented • Variables represent unknown numbers that can be solved for, with sufficient information	• Linear Inequality • Substitution	
MA.A1.2.4	Solve linear inequalities using properties of order.	• Inverse operations are used to simplify linear inequalities • When multiplying or dividing across the inequality symbol, the symbol must be switched to the opposite direction	•	

LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.2.5	Solve combined linear inequalities.	• Inequalities with one variable can be graphed on a number line • Inequality symbols are used to determine solution sets	• Combined inequalities • Conjunction • Disjunction	
MA.A1.2.6	Solve word problems that involve linear equations, formulas, and inequalities.	• Equations can have no solution, one solution, or multiple solutions • Real world problems can be analyzed or solved using an expression, equation, or inequality	•	

RELATIONS AND FUNCTIONS	Standard	Core Concepts	Key terms	examples
MA.A1.3.1	Sketch a reasonable graph for a given relationship.	• The value of one variable may be uniquely determined by the value of another variable	• Hyperbola • Parabola • Scatterplot	
MA.A1.3.2	Interpret a graph representing a given situation.	• Many real-world functional relationships can be represented by equations • Non-linear functions have a graph that is not a line or part of a line		
MA.A1.3.3	Understand the concept of a function, decide if a given relation is a function, and link equations to functions.	• A function is a relationship pairing each input value with exactly one output value	• Function notation	

RELATIONS AND FUNCTIONS	Standard	Core Concepts	Key terms	examples
MA.A1.3.4	Find the domain and range of a relation.	• A relation is a pairing of numbers in one set, called the domain, with numbers in another set, called the range • Each number in the domain is an input (x-coordinate) • Each number in the range is an output (y-coordinate)	• Domain • Range	

GRAPHING LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.4.1	Graph a linear equation.	• Patterns can come in a model that creates a line on a graph • The value of one variable may be uniquely determined by the value of another variable	• Slope • X-intercept • Y-intercept	
MA.A1.4.2	Find the slope, x-intercept and y-intercept of a line given its graph, its equation, or two points on the line.	• Linear functions represent situations with a constant rate of change • Intercepts are where lines intercept the x- and y-axis on a coordinate plane	•	

GRAPHING LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.4.3	Write the equation of a line in slope-intercept form. Understand how the slope and y-intercept of the graph are related to the equation.	• A linear equation of the form y=mx+b is said to be in slope-intercept form • The slope is m and the y-intercept is b • In a real-life problem involving a linear equation, the y-intercept is often an initial value, and the slope is the rate of change	•	
MA.A1.4.4	Write the equation of a line given appropriate information.	• Two non-vertical parallel lines have the same slope • Two non-vertical perpendicular lines have slopes that are negative reciprocals • Formulas are used to determine parts of a line	•	

GRAPHING LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.4.5	Write the equation of a line that models a data set and use the equation (or the graph of the equation) to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.	• A best-fitting line is the line that lies as close as possible to the data points • Equations of linear models can be used to solve problems in the context of bivariate measurement data	• Line of best fit	
MA.A1.4.6	Graph a linear inequality in two variables.	• An ordered pair (x, y) is a solution of a linear inequality if substituting the values of x and y into the inequality produces a true statement	• Boundary line	

PAIRS OF LINEAR EQUATIONS AND INEQUALITIES	**Standard**	**Core Concepts**	**Key terms**	**examples**
MA.A1.5.1	Use a graph to estimate the solution of a pair of linear equations in two variables.	• A solution of a linear system in two variables is an ordered pair that is a solution of each equation in the system • A linear system has a solution at each point where the graphs of the equations in the system intersect • Linear systems can have one solution, no solution, or infinitely many solutions	• System of linear equations	
MA.A1.5.2	Use a graph to find the solution set of a pair of linear inequalities in two variables.	• A linear system has a solution at each point where the graphs of the equations in the system intersect		

PAIRS OF LINEAR EQUATIONS AND INEQUALITIES	**Standard**	**Core Concepts**	**Key terms**	**examples**
MA.A1.5.3	Understand and use the substitution method to solve a pair of linear equations in two variables.	• Graphically solving a system of linear equations gives an approximate solution. An algebraic approach will give an exact solution • Inverse operations are used to simplify equations • Equal expressions can be substituted for each other	•	
MA.A1.5.4	Understand and use the addition or subtraction method to solve a pair of linear equations in two variables.	• To solve a system of equations by elimination we transform the system such that one variable "cancels out • Linear systems can have one solution, no solution, or infinitely many solutions	•	

PAIRS OF LINEAR EQUATIONS AND INEQUALITIES	Standard	Core Concepts	Key terms	examples
MA.A1.5.5	Understand and use multiplication with the addition or subtraction method to solve a pair of linear equations in two variables.	• Multiplying and dividing are used to create equivalent equations • Equivalent equations are equations with the same solutions	• Equivalent equations	
MA.A1.5.6	Use pairs of linear equations to solve word problems.	• A solution to linear system must satisfy all equations • Variables represent unknown or changing quantities		

POLYNOMIALS	Standard	Core Concepts	Key terms	examples
MA.A1.6.1	Add and subtract polynomials.	• Monomials with the same variables are like terms, and can be added or subtracted • The distributive property is used to simplify expressions or equations with parenthesis present	• Degree • Like terms • Monomial • Binomial • Trinomial • Polynomial	
MA.A1.6.2	Multiply and divide monomials.	• Exponents indicate the number of times the based is used as a factor • Commutative and associative properties are used to evaluate expressions by rearranging and simplifying	•	

POLYNOMIALS	Standard	Core Concepts	Key terms	examples
MA.A1.6.3	Find powers and roots of monomials (only when the answer has an integer exponent).	• To find a power of a power, you multiply the exponents • To find a power of a product, you find the power of each factor and then multiply	•	
MA.A1.6.4	Multiply polynomials.	• The distributive property is used to multiply a polynomial by a monomial • Monomials with the same variables are like terms, and can be added or subtracted	•	F.O.I.L. (first outside inside last)
MA.A1.6.5	Divide polynomials by monomials.	• To divide a monomial by a monomial, divide the coefficients (or simplify them as you would a fraction) and divide the variables with like bases by subtracting their exponents • To divide a polynomial by a monomial, divide each term of the polynomial by the monomial.	•	

POLYNOMIALS	Standard	Core Concepts	Key terms	examples
MA.A1.6.6	Find a common monomial factor in a polynomial.	• The greatest common factor of a polynomial is the GCF of its terms • Each term of a polynomial is divisible by monomial factors • Factors are numbers we multiply together to get another number	• Greatest common factor	
MA.A1.6.7	Factor the difference of two squares and other quadratics.	• Some trinomials and binomials can be broken into its factors • Special binomials and trinomials have special factoring patterns • A perfect square is the product of a rational number multiplied by itself	•	

POLYNOMIALS	Standard	Core Concepts	Key terms	examples
MA.A1.6.8	Understand and describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression.	• A polynomial is a sum of monomials • Zeros of a quadratic function are the members of the solution set of the related quadratic equation • The x-intercept is the x-coordinate of a point where a graph intersects the x-axis	• Quadratic function • X-intercept • factor	

ALGEBRAIC FUNCTIONS	Standard	Core Concepts	Key terms	examples
MA.A1.7.1	Simplify algebraic ratios.	• The ratio of one number to another is the quotient when the first number is divided by the second number (not zero) • Equivalent fractions are created when you divide or multiply the numerator and denominator by the same number	• Ratio	
MA.A1.7.2	Solve algebraic proportions.	• A proportion is an equation that states that two ratios are equal • Cross-products involves multiplying the means and extremes of a proportion	• Proportion • Means • Extremes	

QUADRATIC, CUBIC AND RADICAL EQUATIONS	Standard	Core Concepts	Key terms	examples
MA.A1.8.1	Graph quadratic, cubic, and radical equations.	• Polynomials are named by the term with the highest degree • Formulas are used to determine points on a graph	• Degree	
MA.A1.8.2	Solve quadratic equations by factoring.	• Factors are terms multiplied together to produce a product • Some trinomials and binomials can be broken into its factors • Quadratic equations can be solved when one side of the equation equals zero	• Quadratic equation	

QUADRATIC, CUBIC AND RADICAL EQUATIONS	Standard	Core Concepts	Key terms	examples
MA.A1.8.3	Solve quadratic equations in which a perfect square equals a constant.	• The square of a binomial is a perfect trinomial	• Perfect trinomial	
MA.A1.8.4	Complete the square to solve quadratic equations.	• Completing the square is a method of transforming a quadratic equation so that it is in the form of a perfect trinomial • Equations can be balanced by adding the same number to both sides		
MA.A1.8.5	Derive the quadratic formula by completing the square.	• Inverse operations are used to transform equations	• Quadratic formula	

QUADRATIC, CUBIC AND RADICAL EQUATIONS	Standard	Core Concepts	Key terms	examples
MA.A1.8.6	Solve quadratic equations by using the quadratic formula.	• A quadratic equation can have two, one, or no real number roots • A parabola can have two, one, or no x-intercepts • The graph of a quadratic equation is a parabola	• Discriminant	
MA.A1.8.7	Use quadratic equations to solve word problems.	• Unrealistic solutions to quadratic equations should be eliminated • Quadratic equations are used in situations where two things are multiplied together and they both depend of the same variable.		

QUADRATIC, CUBIC AND RADICAL EQUATIONS	Standard	Core Concepts	Key terms	examples
MA.A1.8.8	Solve equations that contain radical expressions.	• Squaring is the inverse operation to finding a square root • Radicals must be rationalized out of the denominator of a fraction	•	
MA.A1.8.9	Use graphing technology to find approximate solutions of quadratic and cubic equations.	• A cubic equation has a term of degree 3 as its term of highest degree	• Cubic equation	

MATHEMATICAL REASONING AND PROBLEM SOLVING	Standard	Core Concepts	Key terms	examples
MA.A1.9.1	Use a variety of problem solving strategies, such as drawing a diagram, making a chart, guess-and- check, solving a simpler problem, writing an equation, and working backwards.	• Solutions to problems can be determined using a variety of strategies	•	
MA.A1.9.2	Decide whether a solution is reasonable in the context of the original situation.	• Unreasonable solutions should be evaluated and eliminated, if necessary		
MA.A1.9.3	Use the properties of the real number system and the order of operations to justify the steps of simplifying functions and solving equations.	• Many solutions can be checked by substituting the solution into the original problem	•	

MATHEMATICAL REASONING AND PROBLEM SOLVING	Standard	Core Concepts	Key terms	examples
MA.A1.9.4	Understand that the logic of equation solving begins with the assumption that the variable is a number that satisfies the equation, and that the steps taken when solving equations create new equations that have, in most cases, the same solution set as the original. Understand that similar logic applies to solving systems of equations simultaneously.	• Solutions to linear systems satisfy all equations in the system	•	
MA.A1.9.5	Decide whether a given algebraic statement is true always, sometimes, or never (statements involving linear or quadratic expressions, equations, or inequalities).	• Theorems are statements that are shown to be true by use of a logically developed arguments		

MATHEMATICAL REASONING AND PROBLEM SOLVING	Standard	Core Concepts	Key terms	examples
MA.A1.9.6	Distinguish between inductive and deductive reasoning, identifying and providing examples of each.	• Inductive reasoning involves making a general statement based on a number of observations • Deductive reasoning uses known facts, definitions, and accepted properties in a logical order to reach a conclusion or to show that a statement is true	•	
MA.AI.9.7	Identify the hypothesis and conclusion in a logical deduction.	• Logical arguments are based on statements that can be expressed in the form: "if statement p is true, then statement q is false"	• converse	
MA.A1.9.8	Use counterexamples to show that statements are false, recognizing that a single counterexample is sufficient to prove a general statement false.	• Proving that a statement is false requires just one counterexample • Proving that a statement is true requires a deductive proof		