First Nine Weeks		
Grade: MS	**Subject: Algebra I**	**Year: 2016-2017**

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
	<u>Expressions and Operations</u> • Express the square roots and cube roots of whole numbers and the square root of a monomial algebraic expression in simplest radical form **(A.3)**	• Express square roots of a whole number in simplest form. • Express the cube root of a whole number in simplest form. • Express the principal square root of a monomial algebraic expression in simplest form where variables are assumed to have positive values.			
	• Represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables **(A.1)**	• Translate verbal quantitative situations into algebraic expressions and vice versa. • Model real-world situations with algebraic expressions in a variety of representations (concrete, pictorial, symbolic, verbal). • Evaluate algebraic expressions for a given replacement set to include rational numbers. • Evaluate expressions that contain absolute value, square roots, and cube roots.			
	<u>Equations and Inequalities</u> • Solve literal equations (formulas) for a given variables **(A.4a)**	• Solve a literal equation (formula) for a specified variable.			

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	• Justify steps used in simplifying expressions and solving equations, using field properties and axioms of equality that are valid for the set of real numbers and its subsets **(A.4b)** • Solve multistep linear equations algebraically and graphically **(A.4d)** • Solve systems of two linear equations in two variables algebraically and graphically **(A.4e)** • Solve real-world problems involving equations and systems of equations **(A.4f)**	• Simplify expressions and solve equations, using the field properties of the real numbers and properties of equality to justify simplification and solution. • Solve multistep linear equations in one variable. • Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator. • Given a system of two linear equations in two variables that has a unique solution, solve the system by substitution or elimination to find the ordered pair which satisfies both equations. • Given a system of two linear equations in two variables that has a unique solution, solve the system graphically by identifying the point of intersection. • Determine whether a system of two linear equations has one solution, no solution, or infinite solutions. • Write a system of two linear equations that models a real-world situation.			

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		• Interpret and determine the reasonableness of the algebraic or graphical solution of a system of two linear equations that models a real-world situation. • Determine if a linear equation in one variable has one, an infinite number, or no solutions.			

Second Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
	<u>Equations and Inequalities</u> • Solve multistep linear inequalities algebraically and graphically **(A.5a)** • Justify steps used in solving inequalities, using axioms of inequality and properties of order that are valid for the set of real numbers and its subsets **(A.5b)** • Solve real-world problems involving inequalities **(A.5c)** • Solve systems of inequalities **(A.5d)**	• Solve multistep linear inequalities in one variable. • Justify steps used in solving inequalities, using axioms of inequality and properties of order that are valid for the set of real numbers. • Solve real-world problems involving inequalities. • Solve systems of linear inequalities algebraically and graphically.			
	<u>Functions</u> • Determine whether a relation is a function **(A.7a)** • Domain and range **(A.7b)** • Zeros of a function **(A.7c)** • Find the values of a function for elements in its domain **(A.7e)**	• Determine whether a relation, represented by a set of ordered pairs, a table, or a graph is a function. • Identify the domain, range, and zeros of a function presented algebraically or graphically. • For each x in the domain of f, find $f(x)$.			

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	• Make connections between and among multiple representations of functions including concrete, verbal, numeric, graphic and algebraic **(A.7f)**	• Represent relations and functions using concrete, verbal, numeric, graphic, and algebraic forms. Given one representation, students will be able to represent the relation in another form. • Detect patterns in data and represent arithmetic and geometric patterns algebraically.			
	<u>Equations and Inequalities</u> • Determine the slope of a line , the graph the line, or two points on the line. Slope will be described as a rate of change and will be positive, negative, zero, or undefined. **(A.6a)** • Write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line. **(A.6b)**	• Graph linear equations and inequalities in two variables, including those that arise from a variety of real-world situations. • Use the parent function $y = x$ and describe transformations defined by changes in the slope or y-intercept. • Find the slope of the line, given the equation of a linear function. • Find the slope of a line, given the coordinates of two points on the line. • Find the slope of a line, given the graph of a line. • Recognize and describe a line with a slope that is positive, negative, zero, or undefined.			

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		• Use transformational graphing to investigate effects of changes in equation parameters on the graph of the equation. • Write an equation of a line when given the graph of a line. • Write an equation of a line when given two points on the line whose coordinates are integers. • Write an equation of a line when given the slope and a point on the line whose coordinates are integers. • Write an equation of a vertical line as $x = a$. • Write the equation of a horizontal line as $y = c$.			
	• Find x- and y-intercepts and graph. **(A.7d)**	• Identify the intercepts of a function presented algebraically or graphically.			

Third Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
	<u>Expressions and Operations</u> • Apply the laws of exponents to perform operations on expressions. **(A.2a)** • Add, subtract, multiply, and divide polynomials. **(A.2b)** • Factoring completely first- and second-degree binomials and trinomials in one or two variables. Graphing calculators will be used as a tool for factoring and for confirming algebraic factorizations. **(A.2c)**	• Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents. • Model sums, differences, products, and quotients of polynomials with concrete objects and their related pictorial representations. • Relate concrete and pictorial manipulations that model polynomial operations to their corresponding symbolic representations. • Find sums and differences of polynomials. • Find products of polynomials. The factors will have no more than five total terms (i.e. $(4x+2)(3x+5)$ represents four terms and $(x+1)(2x^2+x+3)$ represents five terms). • Find the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor. • Factor completely first- and second-degree polynomials with integral coefficients. • Identify prime polynomials.			

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		• Use the *x*-intercepts from the graphical representation of the polynomial to determine and confirm its factors.			
	<u>Equations and Inequalities</u> • Solve quadratic equations algebraically and graphically. **(A.4c)**	• Solve quadratic equations. • Identify the roots or zeros of a quadratic function over the real number system as the solution(s) to the quadratic equation that is formed by setting the given quadratic expression equal to zero. • Confirm algebraic solutions to linear and quadratic equations, using a graphing calculator.			
	<u>Functions</u> • The student, given a situation in a real-world context, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically. **(A.8)**	• Given a situation, including a real-world situation, determine whether a direct variation exists. • Given a situation, including a real-world situation, determine whether an inverse variation exists. • Write an equation for a direct variation, given a set of data. • Write an equation for an inverse variation, given a set of data. • Graph an equation representing a direct variation, given a set of data.			

Fourth Nine Weeks

# Days	SOL	Student Essential Knowledge and Skills	Resources	Vocabulary	Bloom's
	Statistics • The student, given a set of data, will interpret variation in real-world contexts and calculate and interpret mean absolute deviation, standard deviation, and z-scores. **(A.9)**	• Analyze descriptive statistics to determine the implications for the real-world situations from which the data derive. • Given data, including data in a real-world context, calculate and interpret the mean absolute deviation of a data set. • Given data, including data in a real-world context, calculate variance and standard deviation of a data set and interpret the standard deviation. • Given data, including data in a real-world context, calculate and interpret z-scores for a data set. • Explain ways in which standard deviation addresses dispersion by examining the formula for standard deviation. • Compare and contrast mean absolute deviation and standard deviation in a real-world context.			
	• The student will compare and contrast multiple univariate data sets, using box-and-whisker plots. **(A.10)**	• Compare, contrast, and analyze data, including data from real-world situations displayed in box-and-whisker plots.			

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	• The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve real-world problems, using mathematical models. Mathematical models will include linear and quadratic functions. **(A.11)**	• Write an equation for a curve of best fit, given a set of no more than twenty data points in a table, a graph, or real-world situation. • Make predictions about unknown outcomes, using the equation of the curve of best fit. • Design experiments and collect data to address specific, real-world questions. • Evaluate the reasonableness of a mathematical model of a real-world situation.			