MATH
Learning Expectations for Algebra I

CRLS Learning Expectations	Mass. Standard	Topic/Theme	Key Understandings	Assessments/Evidence
	AI.N.1	Number Sense & Operations	Students will: Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nth roots of positive real numbers for any positive integer n; the inverse relationship between taking the nth root and the nth power of a positive real number; and the density of the set of rational numbers in the set of real numbers.	
	AI.N.2		Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., $3(24-1)=45$, $4\left|3-5\right|+6=14$; apply such simplifications in the solution of problems.	
	AI.N3		Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator.	
	AI.N4		Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.	
	AI.P.1	Patterns, Relations, & Algebra	Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonnacci Numbers), linear, quadratic, and exponential functional relationships.	
	AI.P.2		Use properties of the real number system to judge the validity of equations and inequalities, to prove or disprove statements, and to justify every step in a sequential argument.	

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	AI.P.3	Patterns, Relations, & Algebra	Students will: Demonstrate an understanding of relations and functions. Identify the domain, range, dependent, and independent variables of functions.	
	AI.P.4		Translate between different representations of functions and relations; graphs, equations, point sets, and tabular.	
	AI.P.5		Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x-and y-intercepts from its graph or from a linear equations that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope.	
	AI.P.6		Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the "point slope" form of the equation.	
	AI.P.7		Add, subtract, and multiply polynomials. Divide polynomials by monomials.	
	AI.P.8		Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms, factoring (e.g., a2-b2=(a+b)(a-b), x2+10x+21=(x+3)(x+7), 5x4+10x3-5x2= 5x2 (x2+2x-1)), identifying and canceling common factors in rational expressions, and applying the properties of positive integer exponents.	

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	AI.P.9	Patterns, Relations, & Algebra	Students will: Find solutions to quadratic equations (with real roots) by factoring, completing the square, or using the quadratic formula. Demonstrate an understanding of the equivalence of the methods.	
	AI.P.10		Solve equations and inequalities including those involving absolute value of linear expressions (e.g., $\|x-2\|>5$) and apply to the solution of problems.	
	AI.P.11		Solve everyday problems that can be modeled using linear, reciprocal, quadratic, or exponential functions. Apply appropriate tabular, graphical, or symbolic methods to the solution. Include compound interest, and direct and inverse variation problems. Use technology when appropriate.	
	AI.P.12		Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.	
	AI.D.1	Data Analysis, Statistics, & Probability	Students will: Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data.	
	AI.D.2		Approximate a line of best fit (trend line) given a set of data (e.g., scatterplot). Use technology when appropriate.	
	AI.D.3		Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.	