

Massachusetts State Core Curriculum
Standards adopted 2000
Algebra I

Strand	Reference	Description	High School Algebra Boardworks Presentations
Number Sense and Operations	AI.N.1	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 of and the nth power of a positive real number; and the density of the set of rational numbers in the set of real numbers. (10.N.1)	Calculating with integers Multiplying parentheses The distributive property Factoring Factoring quadratic expressions Exponents and roots Exponent laws Set notation
	AI.N.2	Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., $3(24 - 1) = 45$, $4 3 - 5 + 6 = 14$; apply such simplifications in the solution of problems. (10.N.2)	Exponents Exponent laws Absolute value functions
	AI.N.3	Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., An equation: The square root of 3 squared minus 1 is similar to 2.8.. (10.N.3)	Exponents and roots
	AI.N.4	Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers. (10.N.4)	–
	AI.P.1	Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonacci Numbers), linear, quadratic, and exponential functional relationships. (10.P.1)	Sequences and rules Arithmetic sequences Quadratic sequences 1 Quadratic sequences 2 Geometric sequences Other types of sequences

**Patterns,
Relations, and
Algebra**

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.	Solving linear equations Inequalities Solving linear inequalities Inequalities and regions
AI.P.3	Demonstrate an understanding of relations and functions. Identify the domain, range, dependent, and independent variables of functions.	Functions and relations Domain, range and composite functions
AI.P.4	Translate between different representations of functions and relations: graphs, equations, point sets, and tabular.	Linear graphs Slopes and intercepts The equation of a straight line
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 equation 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. (10.P.2)	Linear graphs Slopes and intercepts Parallel and perpendicular lines The equation of a straight line
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. (10.G.8)	Parallel and perpendicular lines The equation of a straight line
AI.P.7	Add, subtract, and multiply polynomials. Divide polynomials by monomials. (10.P.3)	Operations with polynomials Dividing polynomials
AI.P.8	Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms, factoring (e.g., $a^2 - b^2 = (a + b)(a - b)$, $x^2 + 10x + 21 = (x + 3)(x + 7)$, $5x^4 + 10x^3 - 5x^2 = 5x^2(x^2 + 2x - 1)$), identifying and canceling common factors in rational expressions, and applying the properties of positive integer exponents. (10.P.4)	Factoring Factoring quadratic expressions Quadratic equations and factoring Simplifying rational functions Operations with algebraic fractions Improper fractions Partial fractions

AI.P.9	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. (10.P.5)	Solving quadratic equations
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. (10.P.6)	Solving linear equations Using equations to solve problems Inequalities Solving linear inequalities Inequalities and regions Absolute value functions
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. (10.P.7)	Direct proportion Inverse proportion Compound percentages Using equations to solve problems Problems leading to quadratic equations Problems leading to systems of equations Real-life graphs Exponential growth and decay
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. (10.P.8)	Systems of equations and graphs The elimination method for systems of equations The substitution method for systems of equations Systems of linear and quadratic equations Problems leading to systems of equations

Data Analysis, Statistics, and Probability	AI.D.1	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. (10.D.1)	The mode The mean The median The range and interquartile range Which measure of central tendency Comparing data Scatter plots Bar graphs Histograms
	AI.D.2	Approximate a line of best fit (trend line) given a set of data (e.g., scatterplot). Use technology when appropriate. (10.D.2)	Scatter plots Lines of best fit
	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. (10.D.3)	Methods of sampling 1 Methods of sampling 2