

OVERVIEW OF ALGEBRA I NEXT GENERATION LEARNING STANDARDS

Standards that are shared with Algebra II are labeled [I&II] below.

ALGEBRA (48-61%)

Linear Equations and Inequalities

- Solve one-variable linear equations and simple inequalities (A-REI.3)
- Justify steps in solving linear or quadratic equations (A-REI.1) [I&II]
- Solve systems of linear equations algebraically and graphically (A-REI.6) [I&II]
- Relate an equation's graph to its solutions and write the eqn. of a line (A-REI.D.10)
- Approximate, justify, interpret graphical solution to $f(x) = g(x)$ (linear, polynomial, abs. value, exponential) (A-REI.11) [I&II]
- Solve inequalities and systems of inequalities graphically (A-REI.12)

Quadratic Equations

- Interpret expressions and their parts in context (A-SSE.1, A-SSE.1b)
- Write polynomial in standard form and identify terms, coefficients, degree, leading coefficient, constant (A-SSE.1a)
- Rewrite univariate expressions in equivalent forms (incl. factoring GCF, diff. of 2 squares, $x^2 + bx + c$ trinomials) (A-SSE.2) [I&II]
- Write expressions in equivalent forms to reveal properties (A-SSE.3) [I&II]
- Use properties of exponents to rewrite exponential expressions with integer or linear exponents. (A-SSE.3c) [I&II]
- Add, subtract, multiply polynomials (A-APR.1)
- Solve quadratic equations by inspection, taking square roots, factoring, completing the square, quadratic formula, graphing (and simplify radicals) (A-REI.4) [I&II]
- Solve a quadratic-linear system (parabola only) with rational solutions (A-REI.7a)
- Identify zeroes of quadratic and cubic (only in linear-quadratic product form) polynomials (A-APR.B.3) [I&II]
- Rearrange formulas to highlight a quantity (A-CED.4)

Algebra and Modeling

(linear, quadratic, exponential equations)

- Create one-variable equations and simple inequalities for modeling (A-CED.1) [I&II]
- Create two-variable equations and simple inequalities (A-CED.2)
- Represent constraints by and interpret solutions to equations, inequalities, and systems (A-CED.3)

FUNCTIONS (24-32%)

Exponential Functions

- Distinguish between situations modeled with linear and with exponential functions (F-LE.1)
- Construct linear and exponential functions (including arithmetic and geometric sequences) (F-LE.2) [I&II]
- Observe that exponential growth outpaces linear and quadratic growth (F-LE.3)
- Use properties of exponents to rewrite exponential expressions (A-SSE.3c) [I&II]

Properties of Functions

(linear, quadratic, square root, cube root, piecewise, and exponential functions)

- Identify relations as functions (F-IF.1)
- Evaluate functions, use and interpret function notation (F-IF.2)
- Identify explicit sequences as functions using subscript notation (F-IF.3) [I&II]
- Sketch graphs of functions given verbal description, interpret key features of graphs and tables (F-IF.4) [I&II]
- Determine a function's domain from its graph, identify domain in context (F-IF.5)
- Calculate and interpret average rate of change of a function over an interval (F-IF.6) [I&II]
- Graph functions and show key features (F-IF.7), e.g. intercepts, zeros, increasing and decreasing intervals, positive and negative intervals, extrema, symmetries (F-IF.7a) [I&II]
- Graph square root, piecewise functions (incl. step, absolute value) and show features (F-IF.7b)
- Write a function in different forms to reveal its properties (F-IF.8) [I&II]
- Find and interpret quadratics' zeros, extrema, and symmetry (F-IF.8a)
- Compare functions represented in different ways (F-IF.9) [I&II]

Functions and Modeling

- Write a function to describe a relationship (F-BF.1) [I&II]
- Determine function, explicit sequence, or calculations from context. (F-BF.1a) [I&II]
- Transform linear, quadratic, square root, absolute value, exponential functions (F-BF.3) [I&II]
- Interpret parameters of linear or exponential function in context (F-LE.5) [I&II]

NUMBER & QUANTITY (4-10%)

Sums and Products of Rational Numbers

- Perform arithmetic operations and write equivalent forms of rational numbers and square roots (include rationalizing denominators) (N-RN.3a)
- Categorize the sum of product of rational or irrational numbers (N-RN.3b)

Quantities and Modeling

- Convert quantities between units and interpret the result (N-Q.1)
- Choose a level of accuracy for measurement (N-Q.3)

STATISTICS (7-15%)

Univariate Data

- Represent data with dotplots, histograms, boxplots (S-ID.1)
- Compare center (mean, median) and spread (IQR, sample standard deviation) for data sets (S-ID.2)
- Interpret differences in shape, center, spread, outliers for data sets (S-ID.3)

Bivariate Data

- Create two-way tables, interpret relative (including joint, marginal, conditional) frequencies (S-ID.5)
- Create scatterplots (S-ID.6) [I&II]
- Fit linear functions to data, solve problems in context (S-ID.6a) [I&II]

Linear Models

- Interpret slope and intercept of a linear model in context (S-ID.7)
- Calculate and interpret correlation coefficient for linear fit (S-ID.8)
- Distinguish between correlation and causation (S-ID.9)