MATHEMATICS
Algebra One

Number and Operation

Content Standard 1: **The student interprets multiple uses and forms of numbers and how they relate to each other, fluently uses computational tools and strategies, estimates when appropriate, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
The student: • uses addition, subtraction, multiplication, division, exponentiation, and root-extraction in forming and working with numerical and algebraic expressions [M1a]; • represents numbers in decimal or fractional form and in scientific notation, graphs numbers on the number line and ordered pairs in the coordinate plane [M1e]; • uses concepts such as prime, relatively prime, factor, divisor, multiple, and divisibility in solving problems involving integers [M1j]; • uses a variety of methods to estimate the values of quantities met in applications, and rounds numbers used in applications to an appropriate degree of accuracy [M6b].	The student: • uses number systems such as natural, integer, rational and real numbers; • uses concepts such as prime, factor, divisor, multiple and divisibility in algebraic expressions; • computes with exponential and radical expressions; • * solves problems involving enumeration; • applies the concepts of ratios, proportions, and percents to situations involving simple and compound interest, discounts, commissions, and patterns of growth; • * identifies the results of an algorithm.	The student: • demonstrates the appropriate use of calculators to enhance mathematical concepts and as a problem solving tool: - solves problems according to the order of operations and the properties of operations in working with algebraic expressions; - checks solutions after making reasonable estimates in appropriate units of quantities encountered in real-life problems.

* Indicates skills that are aligned with the Stanford-9 Achievement Test, Task 1 Level

Patterns, Functions and Algebra

Content Standard 2: **The student generalizes patterns and functional relationships, uses symbols to represent mathematical situations, analyzes change in real and abstract situations, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
The student:	The student:	The student:
• models given situations with formulas and functions, and interprets given formulas and functions in terms of situations [M3a];	• recognizes and represents number patterns algebraically;	• demonstrates the appropriate use of graphing calculators to enhance mathematical concepts and as a problem solving tool:
• utilizes the concepts of slope, evaluation, and inverse in working with functions [M3c];	• uses manipulatives, models and simulations to represent mathematical problems and situations;	- sets the range of the window and uses the ZOOM functions;
• understands and uses linear functions as a mathematical representation of proportional relationships [M3f];	• writes and solves problems about situations that can be expressed as a proportional relationship, including percents;	- graphs, examines, and traces linear, quadratic, and exponential functions;
• defines, uses, and manipulates expressions involving variables, parameters, constants, and unknowns in work with formulas, functions, equations, and inequalities [M3h];	• represents situations that involve variable quantities with expressions, equations, inequalities and matrices;	- solves systems of equations; - uses the Calculator Based Laboratory to gather data and explore mathematics concepts.
• represents functional relationships in formulas, tables, and graphs, and translates between pairs of these [M3i];	• uses tables and graphs as tools to interpret expressions, equations and inequalities; • * uses the data in a table to make predictions and to identify graphs that represent functions;	• demonstrates the appropriate use of computers to enhance mathematical concepts and as a problem solving tool: - uses secondary Math Lab Toolkit and similar software packages;
• solves equations symbolically, graphically, and numerically, especially linear, quadratic, and exponential equations [M3j];		

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Patterns, Functions and Algebra

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Performance Standards	Essential Skills	Technology Integration
• uses the quadratic formula for solving quadratic equations [M3j]; • uses functions to analyze patterns and represent their structure [M3o].	• * represents given situations with a linear, quadratic, exponential, or trigonometric function and make projections about the situation based on the function; • * determines the maximum or minimum points of a graph and estimate the area under a curve; • * identifies the equation of a function, given a table of values; • * solves problems involving sequences with recurrence relations and infinite sequences; • discovers, describes, generalizes, and uses basic types of functions, including linear, exponential, periodic, power, rational, squares, and square roots; • simplifies variable expressions involving powers, and order of operations on rational numbers; • applies the addition, multiplication, and equality axioms of real numbers to simplify expressions and gives reasons for statements;	- routinely uses tools, software and on-line resources to gather, evaluate, analyze organize, and convey information pertinent to academic and personal interests; - uses a spreadsheet to create graphs for a set of data; - enters formulas in a spreadsheet to solve problems; - creates graphs in a spreadsheet showing the relationships between various functions; - enters data of functions with various parameter changes in a spreadsheet and analyze the resulting graphs.

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Patterns, Functions and Algebra

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Performance Standards	Essential Skills	Technology Integration
	- simplifies sums, differences, products, and quotients of rational expressions; - solves open sentences in one variable over the set of rational numbers and represents the solution set; * solves linear equations, inequalities and equations with radical; * uses equations, formulas, and inequalities to solve real life problems presented in words; * evaluate polynomials; - add, subtract, multiply and divide polynomials and apply the laws of exponents for multiplication and division; - applies the greatest common factor and special factor patterns to factor polynomials completely; - applies slope-intercept form of an equation in two variables. Explains meaning of slope especially in equations that model real life situations;	

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MATHEMATICS
Algebra One

Patterns, Functions and Algebra

Content Standard 2:   **The student generalizes patterns and functional relationships, uses symbols to represent mathematical situations, analyzes change in real and abstract situations, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
	- explores equations by factoring, using the quadratic formula and with graphing calculators; * describes the changes in graphs that corresponds to changes in the parameters of y = mx + b.	

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Data Analysis, Statistics, and Probability

Content Standard 3:   **The student collects, organizes, represents, evaluates and interprets data; makes predictions based on data, applies basic understandings of chance and probability, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
The student:	The student:	The student:
• uses sampling techniques to draw inferences about large populations [M4c];	• * identifies the measures of central tendency and their effect on a set of data;	• demonstrates the appropriate use of graphing calculators to enhance mathematical concepts and as a problem solving tool:
• makes an inference about a population from a sample that involves uncertainty and uses statistics to estimate the size of that uncertainty [M4d];	• * constructs and draws inferences from charts, tables, and graph;	- collects, organizes, plots, and calculates statistics;
• formulates hypotheses to answer a question and uses data to test hypotheses [M4e];	• * summarizes data and makes predictions from a statistical sample;	- uses the probability and statistics menus.
• interprets representations of data, compares distribution of data, and critiques conclusions and the use of statistics, both in school materials and in public documents [M4f];	• uses line of best fit to predict linear data;	• demonstrates the appropriate use of computers to enhance mathematical concepts and as a problem solving tool;
	• gathers, explores, graphically represents and interprets data;	• enters data into spreadsheets to create graphs.
• creates models of probabilistic situations and understands the role of assumptions in this process [M4h];	• uses simulations, experiments and graph results to explore probabilities of independent and dependent events;	
• uses concepts such as equally likely, sample space, outcome, and event in analyzing situations involving chance [M4i].	• * uses experimental and theoretical probability to represent and solve problems;	
	• * finds probability given a graph of distributions or table of outcomes; including normal distributions.	

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Geometry and Spatial Sense

Content Standard 4:   **The student analyzes characteristics of two- and three- dimensional geometric objects, uses visual and spatial reasoning to analyze mathematical situations, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
The student: • knows, uses and derives formula for perimeter, circumference, area, surface area, and volume for many types of figures [M2e].	The student: • * explores various types of geometric figures and applies properties to find the measures of corresponding sides and angles; • * computes area, surface area, and volume of various plane and solid figures including rectangles and rectangular solids, circles, cones, spheres, pyramids, and prisms; • * finds the area of a closed figure within a closed figure; • * identifies the coordinates of endpoints caused by transformations: rotations, translations, and reflections; • * finds the midpoints of a segment given its coordinates; • * find the area of a rectangle or triangle given the coordinates of the vertices;	The student: • demonstrates the appropriate use of computers to enhance mathematical concepts and as a problem solving tool: - transforms various geometric figures using geometry software packets; - inserts formulas in a spreadsheet and calculate results given different values for variables in a formula; • creates a database to classify a set of figures in terms of congruence and similarity.

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MATHEMATICS
Algebra One

Geometry and Spatial Sense

Content Standard 4:   **The student analyzes characteristics of two- and three- dimensional geometric objects, uses visual and spatial reasoning to analyze mathematical situations, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
	* finds the circumference of a circle given the midpoints of a diameter or radius; * finds the dimensions of a polygon given the coordinates of the polygon; * finds the measures of corresponding parts of similar figures; * uses the Pythagorean Theorem and trigonometric ratios to find values and solve problems; - algebraically describes relationships derived from geometric figures (e. g.: numbers of diagonals in polygons) or figural patterns. (e. g.: triangular or square numbers).	

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MATHEMATICS
Algebra One

Measurement

Content Standard 5:   **The student selects and uses appropriate tools and units for systems of measurement, applies a variety of techniques to determine measurements, and solves real life and career-related problems.**

Performance Standards	Essential Skills	Technology Integration
The student: • uses quotient measures, such as speed and density, that give "per unit" amounts; and uses product measures, such as person-hours [M2j]; • compares slope (rise over run) and angle of elevation as measures of steepness [M2j]; • solves problems involving scale, such as in maps and diagrams [M2n]; • represents constant rates as the slope of a straight line graph and interprets slope as the amount of one quantity (y) per unit amount of another (x) [M3e]; • works with rates of many kinds, expressed numerically, symbolically, and graphically[M3d].	The student: • uses quotient measures such as slope, speed, density, "per unit amounts", and product measures such as work hours and foot-pounds; • * uses sine, cosine, and tangent ratios when appropriate with and without a calculator.	The student: • demonstrates the appropriate use of graphing calculators to enhance mathematical concepts and as a problem solving tool: - uses the trigonometric function keys to solve problems.

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