

PRE-ALGEBRA GRADES 9-12

Standard 1. Use a variety of strategies to solve problems

objectives below address standards
A1.4.1, A1.4.5, A3.4.4, A3.4.7

- 1.1 Translate word problems into math equations and solve them
- 1.2 Take real life problems and write math sentences to describe them
- 1.3 Use formulas to solve problems
- 1.4 Apply problem-solving strategies (patterns, tables, diagrams, simplifying, trial and error) to solve problems

Standard 2. Perform basic operations with rational numbers

objectives below address standards
A1.4.1, A1.4.3, A1.4.5, A1.4.7, A3.4.3, A3.4.4, A4.4.5

- 2.1 Adds, subtracts, multiplies, and divides whole numbers, decimals, fractions, and integers (negative numbers)
- 2.2 chooses appropriate operations to solve problems
- 2.3 Uses grouping symbols properly
- 2.4 Performs operations with exponents
- 2.5 Uses scientific notation to represent numbers
- 2.6 Uses a calculator to perform operations with rational numbers

ALGEBRA 1

GRADES 9-12

Standard 1. The student will be able to

Objectives below address standards
A1.4.7, A3.4.4, A1.4.1, A4.4.3, A4.4.5, A4.4.1, A4.4.2

- 1.1 Understand and work with order of operations, commutative, associative, distributive, and identity properties
- 1.2 Understand closure, exponential notation, and equivalency with regard to the solving of equations.
- 1.3 Understand rational and irrational numbers, polynomials, and factoring
- 1.4 Understand systems of equations, sets, and compound sentences
- 1.5 Understand rational, radical and complex expressions
- 1.6 Understand relations, functions, and quadratic equations

Standard 2. The student will be able to

objectives below address standards
A3.4.4, A3.4.6, A4.4.1, A1.4.7, A4.4.2, A4.4.3

- 2.1 Use the addition property, the multiplication property, and others to solve linear equations
- 2.2 Graph linear equations by using ordered pairs

ALGEBRA 1.5 GRADES 9-12

Standard 1. Be able to solve, graph and analyze linear equations and inequalities

- 1.1 Be able to write and equivalent equation or inequality in simplest form
- 1.2 Recognize and use slope intercept, and standard forms of equations
- 1.3 Be able to identify ordered pairs to graph a line or in a solution set
- 1.4 Know the relationship between ordered pairs, graphs, and equations
- 1.5 Define slope intercepts, domain and range

Standard 2. Be able to solve, graph and analyze systems of equation/inequalities by various methods

- 2.1 Be able to solve by graphing, substitution and linear combination
- 2.2 Know and be able to identify types of solutions

GEOMETRY GRADES 9-12

Standard 1. Understand and use the basic terms, symbols, properties, and postulates of geometry.

Objectives below address standard
A5.4.2

- 1.1 Know the undefined terms of geometry
- 1.2 Know the basic definitions of geometry
- 1.3 Be able to identify the basic geometry symbols.
- 1.4 Know the basic properties and postulates upon which geometry is built.

Standard 2. Be able to use logical reasoning through proofs.

Objectives below address standard
C1.4.1, D1.4.3

- 2.1 Distinguish between postulates, theorems, properties, conjectures and definitions and explain the function of each
- 2.2 Know the difference between deductive and inductive reasoning
- 2.3 Be able to plan a two-column, flow, or paper graph deductive proof.
- 2.4 Know and be able to write different types of conditional (if-then) statements
- 2.5 Know and be able to use the method of indirect proof

Standard 3. Solves multi step algebraic equations

- 3.1 Uses the order of operations to

simplify equations
3.2 Uses inverse operations and properties of equality
3.3 Transforms equations using grouping symbols
3.4 Uses commutative, associative, and distributive properties to simplify equations

Standard 4. Solves problems involving geometric shapes and solids

objectives below address standards **A2.4.1, A2.4.2, A3.4.7, A5.4.4**

4.1 Measures lengths, areas and volumes in conventional and metric units
4.2 Converts between units within a measurement system.
4.3 Calculates perimeters and areas of triangles, quadrilaterals, polygons and circles
4.4 Calculate the volume of prisms and other geometric solids
4.5 Know the vocabulary of geometry
4.6 solve problems using geometric principles

2.3 Define and identify slopes, intercepts, domain and range with regards to graphing linear equations
2.4 Graph linear equations using a table of values, the x and y intercept

method, and the point-slope method
2.5 Graph and identify parallel and perpendicular lines

Standard 3. The student will be able to

Objectives below address standards **A1.4.1, A1.4.7**

3.1 Identify rational and irrational numbers
3.2 Add, subtract, multiply, and divide rational numbers
3.3 Use reciprocals in solving equations dealing with rational numbers
3.4 Utilize those properties necessary to work with rational numbers
3.4 Utilize those properties necessary to work with rational numbers

Standard 4. The student will be able to

Objectives below address standards **A1.4.4**

4.1 Multiply and divide accurately using exponents
4.2 Learn to deal with “0” as an exponent
4.3 Use addition, subtraction, multiplication, and division to evaluate polynomials

Standard 3. Be able to solve graph and analyze quadratic equations

3.1 Be able to write an equivalent

equation or inequality in simplest form
3.2 Be able to determine ordered pairs in a solution set
3.3 Be able to relate ordered pairs, graphs, and equations
3.4 Be able to solve by factoring in combination with the zero product property
3.5 Be able to solve by the quadratic formula

Standard 3. Understand angle and line relationships, alone and within polygons.

Objectives below address standard **A1.4.1, A1.4.3, A1.4.5, A3.4.1, A3.4.3**

3.1 Identify different types of angles,

special angle pairs, and the angles formed when two lines are cut by a transversal
3.2 Distinguish between intersecting (perpendicular and not), parallels, and skew lines.
3.3 State and apply postulates and theorems/conjectures about parallels and perpendicular lines.
3.4 Classify triangles according to sides and to angles
3.5 State and apply the theorems/conjectures and corollaries about the measures of the interior and exterior angles of a triangle
3.6 Recognize and name convex polygons and regular polygons
3.7 find the measures of interior angles and exterior angles of convex polygons
3.8 Identify the corresponding parts of congruent and similar figures (perpendicular and not), parallels, and skew lines.
3.9 State and apply the properties of similar polygons
3.10 Use the properties of proportions to solve problems involving similar polygons.

Standard 5. Use a variety of graphing methods to organize and present data

objectives below address standards **A3.4.1**

5.1 Draw circle graphs, bar graphs, histograms from given data
5.2 Interpret graphs to obtain

information

- 5.3 Plot points on coordinate axes
- 5.4 Make tables of solutions for linear equations
- 5.5 Graph linear equations from a table

- 6.1 Learn graphing concepts using two coordinate axes and the coordinate plane
- 6.2 Understand and work with the concept of slope as related to the graphing of linear equations
- 6.3 Graph using substitution methods, x and y intercepts, and the slope-intercept method
- 6.4 Work with and graph parallel and perpendicular lines
- 6.5 Graph horizontal and vertical lines and understand their respective slopes
- 6.6 Solve systems of equations using graphing methods

- perpendicular bisector of a segment, and angle bisector
- 4.5 Apply the triangle similarity postulates and theorems/conjectures to prove two triangles similar
- 4.6 Apply the Pythagorean theorem and other theorems/conjectures relating to right triangles
- 4.7 Solve right triangle problems by correct selection and use of the tangent, sine, and cosine ratios

Standard 5. The student will be able to

- 5.1 Factor, using common monomial factoring
- 5.2 Factor, as a tool for solving nonlinear equations
- 5.3 Factor, using the difference of squares, perfect square trinomial, and trial and error methods

Standard 6. The student will be able to

Standard 4 Understand the relationships within and between various angles

objectives below address standards **A5.4.1, A5.4.3, A5.4.6, A5.4.5, A2.4.2, A2.4.4, A3.4.3, A3.4.4**

- 4.1 Prove two triangles congruent using the congruence postulates and theorems/conjectures
- 4.2 Deduce information about segments and angles after proving that two triangles are congruent
- 4.3 Apply the theorems/conjectures and corollaries about isosceles triangles
- 4.4 Apply the definitions of the median and altitude of a triangle,

using the concepts of “and” and “or”
8.4 Work with and understand equations and inequalities dealing with absolute value

Standard 7. The student will be able to

- 7.1 Solve systems of equations by substitution
- 7.2 Solve systems by using addition and subtraction methods
- 7.3 Solve systems by using multiplication or division along with addition to solve systems of equations
- 7.4 Determine whether an ordered pair is a solution to the system of equations
- 7.5 Use all of the above methods to solve problems

Standard 8. The student will be able to

- 8.1 Recognize and identify sets by either “roster notation” or “set-builder” notation
- 8.2 Understand the relationship of “Union” or “Intersection” with regards to set notation
- 8.3 Solve and graph conjunctions and disjunctions dealing with inequalities

Standard 5. Understand the properties of the special classes of quadrilaterals.

objectives below address objectives
A5.4.4

- 5.1 Apply the definition of a parallelogram and the theorems about properties of a parallelogram
- 5.2 Prove that certain quadrilaterals are parallelograms
- 5.3 Apply the definitions and identify the special properties of a rectangle, a rhombus, or a square
- 5.4 Determine when a parallelogram is a rectangle, a rhombus, or a square
- 5.5 Apply the definitions and identify the properties of a trapezoid and an isosceles trapezoid

Standard 6. Understand angle, line, and circle relationships

objectives below address standards
A1.4.5, A3.4.3, A3.4.5

- 6.1 Define a circle, a sphere, and terms related to them
- 6.2 Recognize circumscribed and inscribed polygons and circles
- 6.3 Apply theorems/conjectures that relate tangents and radii

- 6.4 Define and apply properties of arcs and central angles
- 6.5 Apply theorems/conjectures about the chords of a circle
- 6.6 Solve problems and prove statements involving inscribed angles and angles formed by chords, secants, and tangents **43**

Standard 9. The student will be able to

- 9.1 Identify and simplify rational expressions
- 9.2 Multiply, divide, add, and subtract rational expressions
- 9.3 Solve equations involving rational expressions
- 9.4 Solve problems involving rational equations

Standard 10. The student will be able to:

- 10.1 Expand the knowledge of rational and irrational numbers
- 10.2 Use tables or calculators to find approximations of irrational numbers
- 10.3 Add and subtract, multiply and divide rational expressions
- 10.4 Solve problems using the Pythagorean Theorem
- 10.5 Solve radical equations and problems involving radical equations

Standard 11. The student will be able to

- 11.1 Identify, evaluate, and graph functions
- 11.2 Graph absolute value and quadratic functions
- 11.3 Solve problems dealing with direct and inverse variation

Standard 7. Be able to use geometric instruments to make drawings

objectives below address standards

A2.4.1, A5.4.8, A6.4.1

- 7.1 Identify basic construction instruments
- 7.2 Perform basic constructions
- 7.3 Solve problems by construction
- 7.4 Enrichment: Conjecture theorems and postulates by using

Standard 8. Understand the basic relationships of coordinate and analytic geometry

objectives below address standards **A1.4.5, A3.4.3, A3.4.4, A4.4.1, A4.4.2, A5.4.7**

- 8.1 State and apply the formulas for distance, midpoint, and slope
- 8.2 Determine whether two lines are parallel, perpendicular, or neither
- 8.3 Identify the slope and y-intercept of the line specified by a given equation
- 8.4 Draw the graph of the line specified by a given equation
- 8.5 Prove statements by using coordinate geometry methods

Standard 9. Understand the various types of symmetry and transformation

objectives below address standards **A5.4.5, A5.4.8**

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Standard 12. The student will be able to

- 12.1 Identify quadratic equations
- 12.2 Write quadratic equations in standard form
- 12.3 Solve quadratic equations by factoring, completing the square, and using the quadratic formula
- 12.4 Identify the number of solutions for a quadratic equation using discriminates

- 9.1 Recognize and use the terms image, pre-image, mapping, one-to-one mapping, transformation, and isometry
- 9.2 Locate the image of figures by reflection, glide-reflection, translation, and rotation
- 9.3 Recognize the properties of the basic mappings
- 9.4 Locate the image of points and algebraic sentences by reflection, glide-reflection translation, and rotation
- 9.5 Describe the symmetry of figures and solids

Standard 10. Understand area, perimeter, and volume

objectives below address standards **A2.4.2, A3.4.3, A3.4.4, A4.4.2**

- 10.1 Know and use the formulas for the areas of rectangles, parallelograms, triangles, rhombuses, trapezoids, and regular polygons
- 10.2 Know and use the formulas for the circumferences and areas of circles
- 10.3 Know and use the formulas for arc lengths and the areas of sectors of a circle
- 10.4 Use lengths and areas to solve problems involving geometric probability
- 10.5 Identify the parts of prisms, pyramids, cylinders, and cones
- 10.6 Find the lateral areas, total areas, and volumes of right prisms, right cones, right cylinders, and regular pyramids

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**ALGEBRA II
GRADES 10-12**

Objectives below are used, reviewed, and taught throughout to address standards:

- A1.4.1, A1.4.3, A1.4.4, A1.4.5, A1.4.7, A3.4.1, A5.4.4, A5.4.6, A6.4.1, B1.4.1, B1.4.2, B1.4.3, C1.4.2, D1.4.2, D1.4.3, E1.4.2, E1.4.3, E1.4.4**

Standard 1. Be able to solve, graph, and analyze linear equations, inequities, and compound functions

Objectives below address standards: **A4.4.1, A4.4.2, A4.4.4, A4.5.2, A5.4.7, A6.4.2,**

A6.4.3, A6.4.4, C1.4.1

- 1.1 Be able to write an equivalent equation or inequality in simplest form
- 1.2 Know slope-intercept, standard, and point-slope form of a line
- 1.3 Be able to identify ordered pairs to graph a line or in a solution set
- 1.4 Know the relationship between ordered pairs, graphs and equations
- 1.5 fit a line to data by estimation through graphing, the least squares method, and the median-median method
- 1.6 Use the slope, distance, and midpoint formulas to solve
- 1.7 Define slope, x and y intercept, domain, and range.

**CONTINUING TOPICS IN
ALGEBRA II
GRADES 11-12**

Standard 1. The student will be able to use a graphing calculator to solve various problems.

Objectives below address standards: **A3.4.3, A3.4.4, A3.4.6, A4.4.2, A4.4.3**

- 1.1 Use a calculator to simplify problems involving powers, roots, negative and $\sim y$
- 1.2 Explore menu option on a graphing calculator
- 1.3 Use a calculator to convert between fractions and decimals and standard and scientific notation
- 1.4 Be able to set upon an appropriate graphing window

Standard 2. The student will be able to recognize and create recursively defined sequences and series

Objectives below address standards: **A4.4.4, B1.4.2, E1.4.2**

- 2.1 Recognize and understand how to use and write recursive definitions for sequences
- 2.2 Use recursive routines to solve problems
- 2.3 Predict and identify limits to sequences
- 2.4 Understand and create graphic representations of sequences

**MATH ANALYSIS/
TRIGONOMETRY
GRADES 11-12**

Standard 1. Will demonstrate correct operation of a graphing calculator and use it to explore function behavior.

Objectives below address standards **A4.4.2, C1.4.1, C1.4.2, C1.4.4, D1.4.2, A5.4.5, D1.4.3**

- 1.1 Be able to graph functions and inequalities, find zeros, maxima and minima
- 1.2 Be able to change the viewing window and to trace and zoom on a function
- 1.3 Be able to graph inverse functions using parametric graphing
- 1.4 Be able to graph polar coordinates and relations
- 1.5 Be able to predict transformation

and validate by graphing

Standard 2. Be able to express mathematical ideas and relationships orally, in writing and graphically

Standard 3. Be able to perform the algebraic and geometric skills of previous courses

Objectives below address standards:

**A1.4.4, A1.4.3, A3.4.3, A3.4.4
A4.4.2, A4.4.3, A1.4.5, A1.4.1
A3.4.3, A3.4.4, A3.4.7, A4.4.2
A4.4.3, A4.4.1, A4.4.5 E1.4.1,
CALCULUS
GRADE 12**

Standard 1. The student should be able to define and evaluate limits

Objectives below address all standards

Objectives below are used, reviewed, and taught throughout to address standards except:

**A1.4.2, A2.4.3, A5.4.8,
A6.4.2, A6.4.3, A6.4.5, A6.4.6**

- 1.1 Use various techniques to find limits
- 1.2 Apply the definition of limits

Standard 2. The student should be able to apply differentiation

- 2.1 Define derivative in terms of slope of tangent and rate of change
- 2.2 solve related rate problems
- 2.3 Solve optimization problems
- 2.4 Sketch curves using first and second derivatives
- 2.5 solve radial and angle of elevation problems

Standard 3. The student should be able to apply integration

- 3.1 Define integration in terms of sigma notation
- 3.2 solve area problems **46**

Standard 2. Be able to solve, graph, and analyze nonlinear equations/inequalities

Objectives below address standards: **A4.4.1, A4.4.2, A4.4.5, C1.4.1**

- 2.1 Be able to write an equivalent equation or inequality in simplest form
- 2.2 Be able to solve by factoring or the quadratic formula
- 2.3 Be able to determine ordered pairs in a solution set
- 2.4 Be able to graph by finding the vertex form
- 2.5 Be able to relate ordered pairs, graphs, and equations
- 2.6 Be able to identify intercepts, zeros, range, and domain
- 2.7 Be able to solve quadratic application problems involving maximum/minimum values, projectile motion, and areas

Standard 3. Be able to solve graph and analyze systems of

linear and non-linear equations/inequalities by various methods.

Objectives below address standards **A4.4.1, A4.4.2, A4.4.3, C1.4.1**

- 3.1 Be able to solve by graphing, substitution and the multiplication-addition method
- 3.2 Know and be able to identify the types of solutions

- 2.5 Find the sum recursive sequences
- 2.6 Understand and use different representations
- 2.7 Find and use explicit formulas to describe authentic sequences, arithmetic series, geometric sequence and geometric series
- 2.8 Investigate limits of sequences and sums
- 2.9 Investigate and create factual patterns

Standard 3. Student will depict data using several one variable data graphs and two variable data graphs

Objectives below address standards: **A4.4.1, A4.4.2, A4.4.3, A6.4.1, A5.4.3, B1.4.2**

- 3.1 Construct, recognize and use box and whisker plots
- 3.2 Identify and use deviation, mean absolute deviation and various

deviation sums

- 3.3 Construct, recognize and use histograms
- 3.4 Construct, recognize and use a best fit line and its equation
- 3.5 Analyze data pairs, domain and range
- 3.6 Construct recognize and use a median model of a best fit line
- 3.7 Construct, recognize and use a least squares model of a best fit line
- 3.8 Use the correlation coefficient to determine linearity of data

- 3.1 Solve linear, quadratic, rational, equations and inequalities
- 3.2 Graph lines and quadratic functions. Find equations knowing facts about the linear and quadratic functions
- 3.3 Perform basic operations using factoring and exponent rules
- 3.4 Prove geometric and algebraic theorems using analytic geometry
- 3.5 Solve right triangles using the sine cosine and tangent

Standard 4. Apply the process of mathematical modeling to real world problem situations using a variety of functions.

Objectives below address standards **A2.4.1, A2.4.2, A2.4.3, A2.4.4, A3.4.1, A3.4.6, B1.4.1, A5.4.2, A6.4.1**

- 4.1 Solve problems involving supply/demand, area/volume,

- profit/loss/fixed costs, greatest integer rounding, surveying, navigation, vectors, laws of motion, linear and circular, latitude and longitude, periodic functions, exponential growth and decay, compound interest, loan repayment
- 4.2 Evaluate formulae that are models of real situations
- 4.3 Find maxima and minima values

Standard 5. Will expand the use of mathematical notation

Objectives below address standards

A1.4.1

- 3.3 solve volume problems using Disc and Shell methods
- 3.4 Solve pressure and force problems

- 3.3 Solve volume problems using Disc and shell methods
- 3.4 Solve pressure and force problems

Standard 4. The student will review Algebra II skills

- 4.1 Simplify, solve, and graph linear, and nonlinear functions
- 4.2 Simplify, solve, and graph conic sections
- 4.3 Simplify, solve, and graph systems of equations
- 4.4 Simplify, solve, and graph exponential and logarithmic functions

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Standard 4. Understand and apply functions

Objectives below address standards: **A4.4.2**

- 4.1 Know the definitions of relation and function
- 4.2 Be able to use function notation
- 4.3 Be able to graph functions and their inverses
- 4.4 Know the attributes of families of functions
- 4.5 Be able to perform the four basic operations of functions, as well as composition of functions
- 4.6 Be able to find inverses of functions
- 4.7 Be able to find the domain and range and identify restrictions on the domain
- 4.8 Understand the effect translation, reflection, scaling, and rotation about a point has on the graph and equation of a function

Standard 5. Be able to graph and analyze conic sections

Objectives below address standards **A4.4.1, A4.4.2, C1.4.1**

- 5.1 Be able to identify the different conic sections by their equations
- 5.2 Be able to graph any given conic section and identify its special features
- 5.3 Be able to write the equation given data points or features such as radius, foci, intercepts, or length of major and minor axes

Standard 4. The student will be able to recognize and write equations of functions and

Objectives below address standards: **A1.4.3, A4.4.1, A4.4.2, A4.4.3**

- 4.1 Create and interpret graphs that describe real world situations
- 4.2 Investigate connections between explicit formulas and graphs of sequence
- 4.3 Discover relationships involving midpoints, parallel line, perpendicular units and slopes
- 4.4 Construct, recognize and translate and reflect quadratic equations and their graphs
- 4.5 Construct, recognize and translate and reflect graphs of a square root and their equations
- 4.6 Construct, recognize and perform transformations of circles
- 4.7 Create, recognize, understand and graph composition of functions

Standard 5. Students will convert between parametric and function forms

Objectives below address standards: **A3.4.7, A4.4.2**

- 5.1 Write a graph parametric equation
- 5.2 Convert between parametric and non parametric
- 5.3 Create geometric shapes based on parametric equations of a circle

- 5.1 Express sets using set notation
- 5.2 Use interval notation as well as inequality notation and words to identify ranges and domains and solutions
- 5.3 Use the calculator to express matrices and to manipulate them
- 5.4 Express functions and composite functions using correct notation

Standard 6. Understand operations on, and the general properties and behavior of, polynomial and rational functions of any degree.

Objectives below address standards **E1.4.2**

- 6.1 State generalizations about the type of graph expected with higher degree polynomial functions and relate that to the number of expected zeros
- 6.2 State generalizations about the type of graph expected from ratios of

- polynomial functions
- 6.3 find asymptotes, vertical, horizontal and others
- 6.4 Find relative maxima and minima points graphically
- 6.5 Find zeros for a functions using synthetic substitution

Standard 7. Possess and working knowledge of trigonometry

Objectives below address standards **A2.4.1, A3.4.6, A5.4.8, B1.4.2, B1.4.3, E1.4.2, E1.4.3, E1.4.4, A2.4.2**

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Standard 6. Be able to perform operations and solve equations containing rational expressions and to graph and analyze rational functions

Objectives below address standards: **A3.4.3, A3.4.4, A3.4.6**

- 6.1 Be able to simplify radicals
- 6.2 Know the definition of complex numbers
- 6.3 Know the four basic operations with radicals and complex numbers
- 6.4 Know the relationship between rational exponents and their radical form
- 6.5 Know the relationship between rational exponents and their radical form
- 6.6 Be able to solve equations with radical/complex solutions
- 6.7 Be able to solve equations reducible to quadratic form

Standard 7. Be able to

perform operations and solve equations containing rational expressions and to graph and analyze rational functions

Objectives below address standards **A3.4.7, A4.4.5**

- 7.1 Be able to perform the four basic operations with rational expressions
- 7.2 Be able to simplify complex fractions
- 7.3 Be able to solve rational equations
- 7.4 Be able to identify holes and asymptotes and graph rational functions

Standard 6. The student will be able to apply right triangle trigonometry to moving objects

Objectives below address standards: **A2.4.4, A5.4.6**

- 6.1 Use sine, cosine and tangent ratios and their inverses to solve application problems
- 6.2 Model motion situations with trip ratios by looking at vertical and horizontal components
- 6.3 Use these models to answer related motion time and position problems

Standard 7. The student will be able to graph and use exponential and logarithmic functions

Objectives below address standards: **A1.4.4, A4.4.2**

- 7.1 Model exponential growth and decay problems
- 7.2 Convert between fractional exponents and root notations and simplistic expressions
- 7.3 Solve rational exponential equations
- 7.4 Solve logarithmic problems and their inverses
- 7.5 Convert between logarithmic functions exponential notation
- 7.6 Use logarithms to solve application problems
- 7.7 Use logarithms and exponents as best fit models for nonlinear data

- 7.1 Use the 6 trig. functions to solve triangles=both right and oblique using the definitions of the functions and also the sine and cosine laws
- 7.2 Convert between radian and degree measures
- 7.3 Use trig. to solve appropriate problems as stated in 4.1 above
- 7.4 Use the unit circle and radians
- 7.5 Use reference triangles and reference angles
- 7.6 Prove trigonometric identities involving single, double and half angles
- 7.7 Solve trigonometric equations and inequalities algebraically and graphically
- 7.8 Use geometric transformations for graphs of trig functions
- 7.9 Relate waves and the sinusoidal graphs

Standard 8. Will be able to use logarithms and exponential functions

Objectives below address standards

E1.4.2

- 8.1 Operate with real number exponents
- 8.2 Use exponential functions to solve appropriate problems from 4.1, above

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Standard 8. Understand and apply exponential and logarithmic functions

- 8.1 Know the relationship between exponential and logarithmic functions
- 8.2 Know the basic properties of logarithms.
- 8.3 Know methods of solving simple logarithmic and exponential equations
- 8.4 Be able to use the exponential to model growth and decay problems and to solve them

Standard 8. The students will understand a variety of discrete topics

Objectives below address standards: **A4.4.4, A6.4.1**

- 8.1 Use simulations and experiential evidence to solve probability problems
- 8.2 Examine differences between experimental and theoretical probability
- 8.3 Construct, analyze and apply network graphs to solve applications
- 8.4 Translate between network graphs and adjacency matrices
- 8.5 Produce a transition matrix and diagram
- 8.6 Use matrix multiplication to solve problems

Standard 9. The student will explore probability and statistics

Objectives below address standards: lead to the limit notation of calculus

A4.4.4, A6.4.4, A6.4.5, A6.4.6

- 9.1 Use probability notation
- 9.2 Use tree diagrams and counting principles to solve problems
- 9.3 Use permutation and combination strategies to solve problems
- 9.4 Understand standard deviation
- 9.5 Use normal curves to solve probability problems

- 8.3 Perform computations to determine values for loans and investments
- 8.4 Use the relationship between the exponential and logarithmic functions to solve equations
- 8.5 Know the laws and properties of logarithmic functions, base 10 and base e ?
- 8.6 Graph these functions

Standard 9. Will develop and explore concepts fundamental to calculus

Objectives below address standards **C1.4.3, D1.4.1**

- 9.1 Determine end behavior models and asymptotes
- 9.2 Be able to identify continuous functions, points of discontinuity, maxima and minima, boundedness, increasing and decreasing functions
- 9.3 Apply composite functions
- 9.4 Use notation and concepts that

Standard 10. The student will begin to analyze functions and relations

Objectives below address standards: **A4.4.2**

- 10.1 Graph and locate asymptotes and holes of rational equations
- 10.2 Use the distance formula
- 10.3 Write and interpret distance and rate functions
- 10.4 Write and interpret parametric representations of moving/rotating objects
- 10.5 Graph ellipses and then components
- 10.6 Graph parabolas and their components
- 10.7 Graph hyperbolas and their components

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**BASIC ARITHMETIC
GRADES 9-12**

Standard 1. Understand the base 10 system and the relationships between whole numbers

Objectives below address standards
A1.4.1, A1.4.7

- 1.1 Compare and order integers
- 1.2 Know place value
- 1.3 Read and write numbers from millionths to trillions
- 1.4 Use $<$, $>$, $=$

Standard 2. Perform basic operations with rational numbers

Objectives below address standards
A1.4.1, A1.4.5, A3.4.7

- 2.1 Add, subtract, multiply and divide whole numbers

- 2.2 Add, subtract, multiply and divide decimals
- 2.3 Add, subtract, multiply and divide fractions
- 2.4 Solve problems involving percentages
- 2.5 Convert between decimals, fractions, and percents
- 2.6 solve problems that include parenthesis

**CONSUMER MATH
GRADES 10-11**

Standard 1. The student should understand and use positive rational numbers to solve mathematical problems

- 1.1 Use basic operations of addition, subtraction, multiplication and division of positive rational numbers
- 1.2 Convert between fractions, percents and decimals in order to solve problems

Standard 2. The student should select and use positive rational numbers to solve mathematical problems

- 2.1 Use problem-solving skills to make financial decisions
- 2.2 Decide the order of operations needed to solve problems
- 2.3 Determine housing and transportation costs such as interest charges, insurance, maintenance and

operation costs

2.4 Use a calculator to solve math problems and determine when it is appropriate to use it

Standard 3. The student should select and use information displayed in chart and or graph form

3.1 Use information from bar graphs, line and circle graphs to answer mathematical problems

PROBLEM SOLVING GRADES 10-12

Standard 1. Students will be able to employ various problem-solving strategies

1.1 Know problem-solving strategies such as draw a diagram, systemic list, eliminate possibilities, matrix logic, look for a pattern, guess and check, sub problems, solve an easier related problem, venn diagrams, finite differences, and others

1.2 Be able to choose an appropriate strategy given a particular problem

Standard 2. Students will develop their technical communication skills

2.1 Prepare written solutions that contain detailed verbal and mathematical explanations of how they solved each problem

2.2 Present solutions on the board to the whole class. They discuss their approach to the problem and respond

to questions from the class and the instructor

2.3 work cooperatively to solve problems and explain their thinking to each other

BASIC STATISTICS GRADES 10-12

Standard 1. Be able to represent, analyze and interpret data, one and two variable, by using various kinds of plots and graphs

Objectives below address standards: **A6.4.1, A6.4.2, A6.4.3, C1.4.1**

1.1 Be able to choose a particular graphing method to best represent a given data set including a line plot, dot plot, stem-and-leaf plot, back-to-back stem plot, box-and-whisker plot, or scatter plot

1.2 Be able to use a graphing calculator or computer spreadsheet to graph and analyze data

1.3 Calculate descriptive statistics associated with data sets such as mean, median, quartiles, range, and inter quartile range

1.4 Examine plots for gaps, clusters, distribution, outliers, etc. in order to describe the data, detect patterns in them, and make conjectures about

them

1.5 Construct a line of best fit for two variable data graphically and use it to predict unknown data values

Standard 2. Be able to calculate probabilities, both theoretical and experimental, and use expected values in decision making

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Standard 3. Use rounding and estimation

Objectives below address standards **A3.4.1**

3.1 Round numbers to a given place

3.2 Estimate sums, differences, products, and quotients of numbers by rounding

3.3 Check answers by estimation

Standard 4. Solve multi-step problems

Objectives below address standards **A6.4.1, A6.4.2, A6.4.3, A6.4.4**

4.1 Solve problems involving several operations

4.2 Apply a five step problem solving method

4.3 Read and explain graphs, charts, and tables

4.4 Make graphs, charts, and tables

Standard 5. Use calculators to perform mathematical operations

Objectives below address standards **C1.4.1**

5.1 Perform basic operations on a calculator

5.2 Check work with a calculator

Standard 6. Use measuring systems to compare and solve problems.

A2.4.1, A2.4.2

3.2 Organize data in tables and charts

3.3 Organize data in tables and charts

3.4 Trace investment possibilities

Standard 4. The student should recognize and use consumer-oriented math symbols, terms and formulas

4.1 Communicate intelligently on subjects of banking, income and economics

4.2 Apply formulas to solve mathematical problems dealing with credit plans, insurance rates and income

Standard 5. The student should understand the importance of math in real life

5.1 Prepare a personal budget, balance a checkbook and figure interest rates

5.2 Protect against errors in billing by determining the accuracy of monthly statements and estimating receipt totals

5.3 Use relationships to predict methods involving situation problems that are beyond his/her previous experience

Objectives below address standards:
A6.4.5, A6.4.6

- 2.1 Use the relative frequency concept of probability to determine numerical probabilities
- 2.2 Be able to estimate probabilities from real data
- 2.3 Know the relationship between estimated and theoretical probability
- 2.4 Be able to find and use expected values
- 2.5 Know when to add and when to multiply probabilities
- 2.6 Know how to use randomness in sampling
- 2.7 Explain outcomes of experiments in terms of probability, odds, and expected values

Standard 3. Be able to demonstrate real-life applications of probability and statistics, use probability and statistics to investigate real-life problems, and interpret statistical information presented in the media

Objectives below address standards:

**A6.4.4, A6.4.5, A6.4.6
C1.4.1, C1.4.2**

- 3.1 Be able to set up and perform and appropriate simulation to model a real situation
- 3.2 Use a graphing calculator or computer to aid in performing simulations

3.3 Understand how statisticians use sampling to get information about a population

3.4 Be able to conduct and elementary survey and to report on possible errors and bias

3.5 Be familiar with the statistical concepts and technical terms associated with survey techniques

3.6 Be able to extend their understanding of sampling to related problems

3.7 Be able to understand and comment critically in newspaper and other reports of surveys and opinion polls