American Christian Academy Math Standards 2025

6th Grade General Math
Content Standards

1) Use appropriate notations [a/b, a to b, a:b] to represent a proportional relationship between quantities and use ratio language to describe the relationship between quantities.
2) Use unit rates to represent and describe ratio relationships.
3) Use ratio and rate reasoning to solve mathematical and real-world problems (including but not limited to percent, measurement conversion, and equivalent ratios) using a variety of models, including tables of equivalent ratios, tape diagrams, double number lines, and equations.
4) Interpret and compute quotients of fractions using visual models and equations to represent problems.
5) Fluently divide multi-digit whole numbers using a standard algorithm to solve real-world and mathematical problems.
6) Add, subtract, multiply, and divide decimals using a standard algorithm.
7) Use the distributive property to express the sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor.
8) Find the greatest common factor (GCF) and least common multiple (LCM) of two or more whole numbers.
9) Use signed numbers to describe quantities that have opposite directions or values and to represent quantities in real-world contexts.
10) Locate integers and other rational numbers on a horizontal or vertical line diagram.
11) Find the position of pairs of integers and other rational numbers on the coordinate plane.
12) Explain the meaning of absolute value and determine the absolute value of rational numbers in real-world contexts.
13) Compare and order rational numbers and absolute value of rational numbers with and without a number line in order to solve real-world and mathematical problems.
14) Write, evaluate, and compare expressions involving whole number exponents.
15) Write, read, and evaluate expressions in which letters represent numbers in real-world contexts.
16) Generate equivalent algebraic expressions using the properties of operations, including inverse, identity, commutative, associative, and distributive.
17) Determine whether two expressions are equivalent and justify the reasoning.
18) Determine whether a value is a solution to an equation or inequality by using substitution to conclude whether a given value makes the equation or inequality true.

19) Write and solve an equation in the form of x+p=q or px=q for cases in which p, q, and x are all non-negative rational numbers to solve real-world and mathematical problems.
20) Write and solve inequalities in the form of x>c, x<c, x≥ c, or x ≤ c to represent a constraint or condition in a real-world or mathematical problem.
21) Identify, represent, and analyze two quantities that change in relationship to one another in real-world or mathematical situations.
22) Write examples and non-examples of statistical questions, explaining that a statistical question anticipates variability in the data related to the question.
23) Calculate, interpret, and compare measures of center (mean, median, mode) and variability (range and interquartile range) in real-world data sets.
24) Represent numerical data graphically, using dot plots, line plots, histograms, stem and leaf plots, and box plots.
25) Graph polygons in the coordinate plane given coordinates of the vertices to solve real-world and mathematical problems.
26) Calculate the area of triangles, special quadrilaterals, and other polygons by composing and decomposing them into known shapes.
27) Determine the surface area of three-dimensional figures by representing them with nets composed of rectangles and triangles to solve real-world and mathematical problems.
28) Apply previous understanding of volume of right rectangular prisms to those with fractional edge lengths to solve real-world and mathematical problems.

Biblical Standards

1) Identify similarities between mathematical truths and the unchanging truths of God's Word.
2) Identify the importance and usefulness in how the ability to number demonstrates the design of orderliness of God's creation and allows us to organize and predict.
3) Identify the significance of the measurements and dimensions of The New Jerusalem.

7th Grade General Math
Content Standards

1) Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions.
2) Represent a relationship between two quantities and determine whether the two quantities are related proportionally.
3) Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease.

4) Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals.
5) Solve real-world and mathematical problems involving the four operations of rational numbers, including complex fractions. Apply properties of operations as strategies where applicable.
6) Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7) Generate expressions in equivalent forms based on context and explain how the quantities are related.
8) Solve multi-step real-world and mathematical problems involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.
9) Use variables to represent quantities in real-world or mathematical problems and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about the quantities.
10) Examine a sample of a population to generalize information about the population.
11) Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
12) Make informal comparative inferences about two populations using measures of center and variability and/or mean absolute deviation in context.
13) Use a number from 0 to 1 to represent the probability of a chance event occurring, explaining that larger numbers indicate greater likelihood of the event occurring, while a number near zero indicates an unlikely event.
14) Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely.
15) Approximate the probability of an event using data generated by a simulation (experimental probability) and compare it to the theoretical probability.
16) Find probabilities of simple and compound events through experimentation or simulation and by analyzing the sample space, representing the probabilities as percents, decimals, or fractions.
17) Solve problems involving scale drawings of geometric figures, including computation of actual lengths and areas from a scale drawing and reproduction of a scale drawing at a different scale.
18) Construct geometric shapes (freehand, using a ruler and a protractor, and using technology), given a written description or measurement constraints with an emphasis on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
19) Describe the two-dimensional figures created by slicing three-dimensional figures into plane sections.

20) Explain the relationships among circumference, diameter, area, and radius of a circle to demonstrate understanding of formulas for the area and circumference of a circle.
21) Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure.

22) Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right rectangular prisms.

Biblical Standards

1) Identify similarities between mathematical truths and the unchanging truths of God's Word.
2) Identify the importance and usefulness in how the ability to number demonstrates the design of orderliness of God's creation and allows us to organize and predict.
3) Identify the significance of the measurements and dimensions of The New Jerusalem.

Pre-Algebra
Content Standards

1) Define the real number system as composed of rational and irrational numbers.
2) Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers.
3) Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions.
4) Use square root and cube root symbols to represent solutions to equations.
5) Estimate and compare very large or very small numbers in scientific notation.
6) Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.
7) Determine whether a relationship between two variables is proportional or non-proportional.
8) Graph proportional relationships.
9) Interpret $y = mx + b$ as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept.
10) Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.
11) Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms.

12) Solve systems of two linear equations in two variables by graphing and substitution.
13) Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs.
14) Evaluate functions defined by a rule or an equation, given values for the independent variable.
15) Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.
16) Construct a function to model a linear relationship between two variables.
17) Analyze the relationship (increasing or decreasing, linear or non-linear) between two quantities represented in a graph.
18) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and non-linear association, clustering, and outliers.
19) Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and assess the model fit by judging the closeness of the data points to the line.
20) Use a linear model of a real-world situation to solve problems and make predictions.
21) Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables.
22) Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables.
23) Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two dimensional figures.
24) Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them.
25) Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures.
26) Informally justify the Pythagorean Theorem and its converse.
27) Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane.
28) Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications.
29) Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions.
30) Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real world problems.

Biblical Standards

1) Examine how rationals and irrationals display God's ineffable and perfect nature.
2) Apply scientific notation to real-world contexts in order to investigate the largeness of God's creation.
3) Compare God's order in creation with the importance of standard order for evaluating expressions.

Algebra I

Content Standards

1) Explain how the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for an additional notation for radicals using rational exponents.
2) Rewrite expressions involving radicals and rational exponents using the properties of exponents.
3) Define the imaginary number i such that i 2 = -1.
4) Interpret linear, quadratic, and exponential expressions in terms of a context by viewing one or more of their parts as a single entity.
5) Use the structure of an expression to identify ways to rewrite it.
6) Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
7) Add, subtract, and multiply polynomials, showing that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.
8) Explain why extraneous solutions to an equation involving absolute values may arise and how to check to be sure that a candidate solution satisfies an equation.
9) Select an appropriate method to solve a quadratic equation in one variable.
10) Select an appropriate method to solve a system of two linear equations in two variables.
11) Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. **Extend from contexts arising from linear functions to those involving quadratic, exponential, and absolute value functions.**
12) Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. L**imit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**
13) Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. **Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**
14) Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane.

15) Define a function as a mapping from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range.
16) Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function. Explain that a function f is a special kind of relation defined by the equation y = f(x).
17) Combine different types of standard functions to write, evaluate, and interpret functions in context. **Limit to linear, quadratic, exponential, and absolute value functions.**
18) Solve systems consisting of linear and/or quadratic equations in two variables graphically, using technology where appropriate.
19) Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x).
20) Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes, using technology where appropriate.
21) Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). **Extend from linear to quadratic, exponential, absolute value, and general piecewise.**
22) Define sequences as functions, including recursive definitions, whose domain is a subset of the integers.
23) Identify the effect on the graph of replacing *f(x)* by *f(x)+k, k.f(x), f(k.x),* and *f(x+k)* for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and explain the effects on the graph, using technology as appropriate. **Limit to linear, quadratic, exponential, absolute value, and linear piecewise functions.**
24) Distinguish between situations that can be modeled with linear functions and those that can be modeled with exponential functions.
25) Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
26) Use graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.
27) Interpret the parameters of functions in terms of a context.
28) For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
29) Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
30) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

31) Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions.
32) Use mathematical and statistical reasoning with bivariate categorical data in order to draw conclusions and assess risk.
33) Design and carry out an investigation to determine whether there appears to be an association between two categorical variables, and write a persuasive argument based on the results of the investigation.
34) Distinguish between quantitative and categorical data and between the techniques that may be used for analyzing data of these two types.
35) Analyze the possible association between two categorical variables.
36) Generate a two-way categorical table in order to find and evaluate solutions to real-world problems.
37) Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
38) Explain whether two events, A and B, are independent, using two-way tables or tree diagrams.
39) Compute the conditional probability of event A given event B, using two-way tables or tree diagrams.
40) Recognize and describe the concepts of conditional probability and independence in everyday situations and explain them using everyday language.
41) Explain why the conditional probability of A given B is the fraction of B's outcomes that also belong to A, and interpret the answer in context.

Biblical Standards

1) Analyze the complexity of God's created universe and how this relates to mathematical order and patterns.
2) Describe how to fulfill God's command to be wise stewards of His resources including financial resources.
3) Summarize God's faithfulness to us through consistency in His creation relating to patterns and predictions.

Geometry
Content Standards

1) Extend understanding of irrational and rational numbers by rewriting expressions involving radicals, including addition, subtraction, multiplication, and division, in order to recognize geometric patterns.
2) Use units as a way to understand problems and to guide the solution of multi-step problems.

3) Find the coordinates of the vertices of a polygon determined by a set of lines, given their equations, by setting their function rules equal and solving, or by using their graphs.
4) Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
5) Verify that the graph of a linear equation in two variables is the set of all its solutions plotted in the coordinate plane, which forms a line.
6) Derive the equation of a circle of given center and radius using the Pythagorean Theorem.
7) Use mathematical and statistical reasoning with quantitative data, both univariate data (set of values) and bivariate data (set of pairs of values) that suggest a linear association, in order to draw conclusions and assess risk.
8) Use technology to organize data, including very large data sets, into a useful and manageable structure.
9) Represent the distribution of univariate quantitative data with plots on the real number line, choosing a format (dot plot, histogram, or box plot) most appropriate to the data set, and represent the distribution of bivariate quantitative data with a scatter plot.
10) Use statistics appropriate to the shape of the data distribution to compare and contrast two or more data sets, utilizing the mean and median for center and the interquartile range and standard deviation for variability.
11) Interpret differences in shape, center, and spread in the context of data sets, accounting for possible effects of extreme data points (outliers) on mean and standard deviation.
12) Represent data of two quantitative variables on a scatter plot, and describe how the variables are related.
13) Compute (using technology) and interpret the correlation coefficient of a linear relationship.
14) Distinguish between correlation and causation.
15) Evaluate possible solutions to real-life problems by developing linear models of contextual situations and using them to predict unknown values.
16) Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
17) Model and solve problems using surface area and volume of solids, including composite solids and solids with portions removed.
18) Given the coordinates of the vertices of a polygon, compute its perimeter and area using a variety of methods, including the distance formula and dynamic geometry software, and evaluate the accuracy of the results.
19) Derive and apply the relationships between the lengths, perimeters, areas, and volumes of similar figures in relation to their scale factor.

20) Derive and apply the formula for the length of an arc and the formula for the area of a sector.
21) Represent transformations and compositions of transformations in the plane (coordinate and otherwise) using tools such as tracing paper and geometry software.
22) Explore rotations, reflections, and translations using graph paper, tracing paper, and geometry software.
23) Develop definitions of rotation, reflection, and translation in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
24) Define congruence of two figures in terms of rigid motions (a sequence of translations, rotations, and reflections); show that two figures are congruent by finding a sequence of rigid motions that maps one figure to the other.
25) Verify criteria for showing triangles are congruent using a sequence of rigid motions that map one triangle to another.
26) Verify experimentally the properties of dilations given by a center and a scale factor.
27) Given two figures, determine whether they are similar by identifying a similarity transformation (sequence of rigid motions and dilations) that maps one figure to the other.
28) Verify criteria for showing triangles are similar using a similarity transformation (sequence of rigid motions and dilations) that maps one triangle to another.
29) Find patterns and relationships in figures including lines, triangles, quadrilaterals, and circles, using technology and other tools.
30) Develop and use precise definitions of figures such as angle, circle, perpendicular lines, parallel lines, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
31) Justify whether conjectures are true or false in order to prove theorems and then apply those theorems in solving problems, communicating proofs in a variety of ways, including flow chart, two-column, and paragraph formats.
32) Use coordinates to prove simple geometric theorems algebraically.
33) Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems.
34) Use congruence and similarity criteria for triangles to solve problems in real-world contexts.
35) Discover and apply relationships in similar right triangles.
36) Use geometric shapes, their measures, and their properties to model objects and use those models to solve problems.
37) Investigate and apply relationships among inscribed angles, radii, and chords, including but not limited to: the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.

38) Use the mathematical modeling cycle involving geometric methods to solve design problems.

Biblical Standards

1) Identify geometric tools mentioned in Scripture.
2) Explain the importance of understanding measurements and the units used in biblical times and how it can help us better understand Scripture.
3) Identify the set of architectural plans God gave to Moses for building the tabernacle.
4) Explain how transformations from a biblical standpoint compare to the mathematical description.

Algebra II
Content Standards

1) Identify numbers written in the form $a + bi$, where a and b are real numbers and $i^2 = 1$, as complex numbers.
2) Use matrices to represent and manipulate data.
3) Multiply matrices by scalars to produce new matrices.
4) Add, subtract, and multiply matrices of appropriate dimensions.
5) Describe the roles that zero and identity matrices play in matrix addition and multiplication, recognizing that they are similar to the roles of 0 and 1 in the real numbers.
6) Factor polynomials using common factoring techniques and use the factored form of a polynomial to reveal the zeros of the function it defines.
7) Prove polynomial identities and use them to describe numerical relationships.
8) Explain why extraneous solutions to an equation may arise and how to check to be sure that a candidate solution satisfies an equation. **Extend to radical equations**.
9) For exponential models, express as a logarithm the solution to $abct = d$, where a, c, and d are real numbers and the base b is 2 or 10; evaluate the logarithm using technology to solve an exponential equation.
10) Create equations and inequalities in one variable and use them to solve problems. **Extend to equations arising from polynomial, trigonometric (sine and cosine), logarithmic, radical, and general piecewise functions.**
11) Solve quadratic equations with real coefficients that have complex solutions.
12) Solve simple equations involving exponential, radical, logarithmic, and trigonometric functions using inverse functions.
13) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales and use them to make predictions. **Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.**

14) Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$.
15) Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). **Extend to polynomial, trigonometric (sine and cosine), logarithmic, radical, and general piecewise functions.**
16) Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k \cdot f(x)$, $f(k \cdot x)$ and $f(x+k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.
17) For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
18) Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. **Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.**
19) Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. **Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.**
20) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. **Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.**
21) Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle, building on work with non-right triangle trigonometry.
22) Use the mathematical modeling cycle to solve real-world problems involving polynomial, trigonometric (sine and cosine), logarithmic, radical, and general piecewise functions, from the simplification of the problem through the solving of the simplified problem, the interpretation of its solution, and the checking of the solution's feasibility.
23) Use mathematical and statistical reasoning about normal distributions to draw conclusions and assess risk; limit to informal arguments.
24) Design and carry out an experiment or survey to answer a question of interest, and write an informal persuasive argument based on the results.
25) From a normal distribution, use technology to find the mean and standard deviation and estimate population percentages by applying the empirical rule.
26) Describe the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

27) Distinguish between a statistic and a parameter and use statistical processes to make inferences about population parameters based on statistics from random samples from that population.

28) Describe differences between randomly selecting samples and randomly assigning subjects to experimental treatment groups in terms of inferences drawn regarding a population versus regarding cause and effect.

29) Explain the consequences, due to uncontrolled variables, of non-randomized assignment of subjects to groups in experiments.

30) Evaluate where bias, including sampling, response, or nonresponse bias, may occur in surveys, and whether results are representative of the population of interest.

31) Evaluate the effect of sample size on the expected variability in the sampling distribution of a sample statistic.

32) Produce a sampling distribution by repeatedly selecting samples of the same size from a given population or from a population simulated by bootstrapping (resampling with replacement from an observed sample). Do initial examples by hand, then use technology to generate a large number of samples.

33) Use data from a randomized experiment to compare two treatments; limit to informal use of simulations to decide if an observed difference in the responses of the two treatment groups is unlikely to have occurred due to randomization alone, thus implying that the difference between the treatment groups is meaningful.

Biblical Standards

1) Analyze our dominion responsibilities and God's provisional promises.
2) Describe how to use mathematics to meet human needs and manage natural resources.
3) Examine the truth of the Bible and how studying the Bible can prevent being swayed from God's truth. (Understanding math truths leads to accurate conclusions)

Precalculus
Content Standards

1) Define the constant e in a variety of contexts.
2) Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
3) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.

4) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.
5) Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.
6) Analyze possible zeros for a polynomial function over the complex numbers by applying the Fundamental Theorem of Algebra, using a graph of the function, or factoring with algebraic identities.
7) Determine numerically, algebraically, and graphically the limits of functions at specific values and at infinity.
8) Explain that vector quantities have both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes.
9) Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
10) Solve problems involving velocity and other quantities that can be represented by vectors.
11) Find the scalar (dot) product of two vectors as the sum of the products of corresponding components and explain its relationship to the cosine of the angle formed by two vectors.
12) Add and subtract vectors.
13) Multiply a vector by a scalar.
14) Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.
15) Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems, extending to infinite geometric series.
16) Derive and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.
17) Know and apply the Binomial Theorem for the expansion of (x + y) n in powers of x and y for a positive integer, n, where x and y are any numbers.
18) Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated cases, a computer algebra system.
19) Add, subtract, multiply, and divide rational expressions.
20) Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a clear-cut solution. Construct a viable argument to justify a solution method.

21) Solve simple rational equations in one variable, and give examples showing how extraneous solutions may arise. Solve systems of equations.
22) Represent a system of linear equations as a single matrix equation in a vector variable.
23) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 x 3 or greater).
24) Compare and contrast families of functions and their representations algebraically, graphically, numerically, and verbally in terms of their key features.
25) Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.
26) Graph functions expressed symbolically and show key features of the graph, by hand and using technology. Use the equation of functions to identify key features in order to generate a graph.
27) Compose functions. **Extend to polynomial, trigonometric, radical, and rational functions.**
28) Find inverse functions.
29) Use the inverse relationship between exponents and logarithms to solve problems involving logarithms and exponents. **Extend from logarithms with base 2 and 10 to a base of *e*.**
30) Identify the effect on the graph of replacing *f(x) by f(x) + k, k . f(x), f(k . x) and* $ff(xx + kk)$ for specific values of k (both positive and negative); find the value of k given the graphs. Extend the analysis to include all trigonometric, rational, and general piecewise-defined functions with and without technology.
31) Graph conic sections from second-degree equations, extending from circles and parabolas to ellipses and hyperbolas, using technology to discover patterns.
32) Solve application-based problems involving parametric and polar equations.
33) Use special triangles to determine geometrically the values of sine, cosine, and tangent for π/3, π/4, and π/6, and use the unit circle to express the values of sine, cosine, and tangent for π – x, π + x, and 2π – x in terms of their values for x, where x is any real number.
34) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
35) Demonstrate that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.
36) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.
37) Use trigonometric identities to solve problems.

Biblical Standards

1) Analyze and describe the structure of polynomial, exponential, and trigonometric functions, recognizing these patterns as evidence of God's orderly

and logical creation.

2) Apply problem-solving techniques in solving complex precalculus problems modeling the biblical virtue of perseverance and diligence by working "Heartily unto the Lord".
3) Model real-world phenomena using functions and mathematical reasoning to understand patterns in God's creation, which supports responsible stewardship and wise decision-making.

Statistics

Content Standards

1) Identify the question to be answered or problem to be solved.
2) Identify key and relevant information to answer a question or solve a problem.
3) Describe an appropriate method for gathering and representing data.
4) Describe data presented numerically or graphically.
5) Construct numerical or graphical representations of distributions.
6) Calculate summary statistics, relative positions of points within a distribution, correlation, and predicted response.
7) Compare distributions or relative positions of points within a distribution.
8) Determine relative frequencies, proportions, or probabilities using simulation or calculations.
9) Determine parameters for probability distributions.
10) Describe probability distributions.
11) Make an appropriate claim or draw an appropriate conclusion.
12) Interpret statistical calculations and findings to assign meaning or assess a claim.
13) Identify an appropriate inference method for confidence intervals.
14) Identify an appropriate inference method for significance tests.
15) Identify null and alternative hypotheses.
16) Construct a confidence interval, provided conditions for inference are met.
17) Calculate a test statistic and find a p-value, provided conditions for inference are met.
18) Verify that inference procedures apply in a given situation.
19) Justify a claim based on a confidence interval.
20) Justify a claim using a decision based on significance tests.

Biblical Standards

1) Analyze using business profits to glorify the Lord. (God's command about work, laboring for the Lord)
2) Examine being honest before God and Man and how this relates to the business setting.
3) Describe how to use careers to share the gospel with others.

Calculus

Content Standards

1) Understand the concept of a limit graphically, numerically, analytically, and contextually.
2) Understand the definition and graphical interpretation of continuity of a function.
3) Understand the concept of the derivative of a function geometrically, numerically, analytically, and verbally.
4) Apply the rules of differentiation to functions.
5) Apply theorems and rules of differentiation to solve mathematical and real-world problems.
6) Understand the concept of the integral of a function geometrically, numerically, analytically, and contextually.
7) Apply theorems and rules of integration to solve mathematical and real-world problems.

Biblical Standards

1) Analyze limits, continuity, and rates of change to model dynamic systems, recognizing these concepts as reflections of God's unchanging nature in an ever-changing world.
2) Use derivatives and integrals to model and solve real-world problems, understanding that these mathematical tools can be used to care for and wisely manage God's creation.
3) Approach multi-step calculus problems with perseverance and diligence, acknowledging that the gift of mathematics is used to explore and discover God's creation with excellence.

Algebra 3
Content Standards

1) Create equations in two or more variables to represent relationships between quantities. Graph the equations on coordinate axes using appropriate labels, units, and scales.
2) Write a function that describes a relationship between two quantities.
3) Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
4) Given a function in graphical, symbolic, or tabular form, determine the average rate of change of the function over a specified interval. Interpret the meaning of the average rate of change in a given context.
5) Create equations in two or more variables to represent relationships between quantities. Graph the equations on coordinate axes using appropriate labels, units, and scales.
6) Use systems of equations and inequalities to represent constraints arising in real-world situations. Solve such systems using graphical and analytical methods,

including linear programing. Interpret the solution within the context of the situation. (Limit to linear programming.)

7) Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. Understand that such systems may have zero, one, two, or infinitely many solutions. (Limit to linear equations and quadratic functions.)
8) Represent a system of linear equations as a single matrix equation in a vector variable.
9) Using technology for matrices of dimension 3 × 3 or greater, find the inverse of a matrix if it exists and use it to solve systems of linear equations.
10) Use matrices to represent and manipulate data.
11) Perform operations with matrices of appropriate dimensions including addition, subtraction, and scalar multiplication.
12) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.
13) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
14) Describe the effect of the transformations □□□□(□□), □□(□□)+□□, □□(□□
combinations of such transformations on the graph of □□=□□(□□) for any real number □□. the value of □□ given the graphs and write the equation of a transformed parent function given its graph.
15) Understand that an inverse function can be obtained by expressing the dependent
16) variable of one function as the independent variable of another, as f and g are inverse functions if and only if $f(x)=y$ *and* $g(y)=x$, for all values of x in the domain of f and all values of y in the domain of g, and find inverse functions for one-to-one function or by restricting the domain.
17) Interpret key features of a function that models the relationship between two quantities when given in graphical or tabular form. Sketch the graph of a function from a verbal description showing key features. Key features include intercepts; intervals where the function is increasing, decreasing, constant, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity.
18) Graph functions from their symbolic representations. Indicate key features including intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity. Graph simple cases by hand and use technology for complicated cases.
19) Relate the domain and range of a function to its graph and, where applicable, to the quantitative relationship it describes.
20) Solve simple rational and radical equations in one variable and understand how extraneous solutions may arise.
21) Solve mathematical and real-world problems involving quadratic equations in one variable.

22) Know and apply the Division Theorem and the Remainder Theorem for polynomials.
23) Graph polynomials identifying zeros when suitable factorizations are available and indicating end behavior. Write a polynomial function of least degree corresponding to a given graph.
24) Write a function that describes a relationship between two quantities.
25) Know the Fundamental Theorem of Algebra and explain why complex roots of polynomials with real coefficients must occur in conjugate pairs.
26) Solve right triangles in applied problems using trigonometric ratios and the Pythagorean Theorem.
27) Define sine and cosine as functions of the radian measure of an angle in terms of the ?? - and ?? -coordinates of the point on the unit circle corresponding to that angle and explain how these definitions are extensions of the right triangle definitions.
28) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.
29) Use the Law of Sines and the Law of Cosines to solve for unknown measures of sides and angles of triangles that arise in mathematical and real-world problems.
30) Translate between different but equivalent forms of a function equation to reveal and explain different properties of the function.
31) Distinguish between situations that can be modeled with linear functions or exponential functions by recognizing situations in which one quantity changes at a constant rate per unit interval as opposed to those in which a quantity changes by a constant percent rate per unit interval.
32) Graph functions from their symbolic representations. Indicate key features including intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior and periodicity. Graph simple cases by hand and use technology for complicated cases.
33) Express a logarithm as the solution to the exponential equation, ?????? where ??, ??, and ?? are numbers and the base ?? is 2, 10, or ??; evaluate the logarithm technology.
34) Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
35) Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems including applications to finance.
36) Apply the Addition Rule and the Multiplication Rule to determine probabilities, including conditional probabilities, and interpret the results in terms of the probability model.
37) Use permutations and combinations to solve mathematical and real-world problems, including determining probabilities of compound events. Justify the results.
38) Use probability to evaluate outcomes of decisions. Use probabilities to make fair decisions.
39) Analyze decisions and strategies using probability concepts.

Biblical Standards

1) Recognize that pattern recognition and logical reasoning reflect God's intentional design in creation.
2) Understand the role of logic and order in mathematics as a reflection of God's character and truth.
3) Compare the consistency and structure of mathematical principles to the moral guidance provided by the Ten Commandments.