
Mathematics Curriculum Standards, 9-12

The Background:

In March 2007, Tennessee joined the American Diploma Project (ADP) Network, a network of thirty states committed to restoring value to the high school diploma by increasing the rigor of high school academic standards and aligning those standards with workforce and postsecondary demands. Immediately upon becoming an ADP state, Tennessee began the work of revising core content standards in the areas of Algebra I, Algebra II, and Geometry.

Overview of Standards Revision Process

- ❖ Writing teams comprising 9-12 educators and college professors are assembled (May 2007).
- ❖ Standards are revised to ensure alignment with ADP benchmarks, ACT benchmarks, NAEP standards, and NCTM standards (June 2007).
- ❖ Draft documents are finalized for submission to Achieve (July 2007).
- ❖ Achieve conducts side-by-side analyses of the revised standards and ADP benchmarks (August 2007).
- ❖ Content consultants, upon receiving the side-by-side analyses, address areas of weakness and coordinate the process for Quality Review I with Achieve (August 2007).
- ❖ Content consultants, using feedback provided via Quality Review I, make final revisions to the draft documents (October-November 2007).
- ❖ Revised Algebra I, Algebra II, and Geometry standards are submitted for State Board approval (November 2007).

Concurrent to this work, K-8 mathematics standards are being revised to support the increased expectations and rigor of the ADP-aligned high school courses. Final drafts of the K-8 curriculum will be submitted for State Board approval in January 2008.

The Master Plan Connection:

This item supports the State Board's Master Plan by providing rigorous, relevant core content standards in the areas of high school English and mathematics.

The Recommendation:

The Department of Education recommends adoption of the Algebra I, Algebra II, and Geometry standards on final reading. The SBE staff concurs with this recommendation.

Tennessee Mathematics Standards

Algebra I

Standard 1 – Mathematical Processes

Course Level Expectations:

- CLE 3102.1.1 Use mathematical language, symbols, definitions, proofs and counterexamples correctly and precisely in mathematical reasoning.
- CLE 3102.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including testing cases, estimation, and then checking induced errors and the reasonableness of the solution.
- CLE 3102.1.3 Develop inductive and deductive reasoning to independently make and evaluate mathematical arguments and construct appropriate proofs; include various types of reasoning, logic, and intuition.
- CLE 3102.1.4 Move flexibly between multiple representations (contextual, physical, written, verbal, iconic/pictorial, graphical, tabular, and symbolic), to solve problems, to model mathematical ideas, and to communicate solution strategies.
- CLE 3102.1.5 Recognize and use mathematical ideas and processes that arise in different settings, with an emphasis on formulating a problem in mathematical terms, interpreting the solutions, mathematical ideas, and communication of solution strategies.
- CLE 3102.1.6 Employ reading and writing to recognize the major themes of mathematical processes, the historical development of mathematics, and the connections between mathematics and the real world.
- CLE 3102.1.7 Use technologies appropriately to develop understanding of abstract mathematical ideas, to facilitate problem solving, and to produce accurate and reliable models.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3102.1.1 Develop meaning for mathematical vocabulary.
- ✓ 3102.1.2 Use the terminology of mathematics correctly.
- ✓ 3102.1.3 Understand and use mathematical symbols, notation, and common mathematical abbreviations correctly.
- ✓ 3102.1.4 Write a rule with variables that expresses a pattern.
- ✓ 3102.1.5 Use formulas, equations, and inequalities to solve real-world problems including time/rate/distance, percent increase/decrease, ratio/proportion, and mixture problems.
- ✓ 3102.1.6 Use a variety of strategies to estimate and compute solutions, including real-world problems.
- ✓ 3102.1.7 Identify missing or irrelevant information in problems.
- ✓ 3102.1.8 Recognize and perform multiple steps in problem solving when necessary.

- ✓ 3102.1.9 Identify and use properties of the real numbers (including commutative, associative, distributive, inverse, identity element, closure, reflexive, symmetric, transitive, operation properties of equality).
- ✓ 3102.1.10 Use algebraic properties to develop a valid mathematical argument.
- ✓ 3102.1.11 Use manipulatives to model algebraic concepts.
- ✓ 3102.1.12 Create and work flexibly among representations of relations (including verbal, equations, tables, mappings, graphs).
- ✓ 3102.1.13 Change from one representation of a relation to another representation, for example, change from a verbal description to a graph.
- ✓ 3102.1.14 Apply graphical transformations that occur when changes are made to coefficients and constants in functions.
- ✓ 3102.1.15 Apply arithmetic concepts in algebraic contexts.
- ✓ 3102.1.16 Understand and express the meaning of the slope and y-intercept of linear functions in real-world contexts.
- ✓ 3102.1.17 Connect the study of algebra to the historical development of algebra.
- ✓ 3102.1.18 Translate syntax of technology to appropriate mathematical notation.
- ✓ 3102.1.19 Recognize and practice appropriate use of technology in representations and in problem solving.
- ✓ 3102.1.20 Estimate solutions to evaluate the reasonableness of results and to check technological computation.

State Performance Indicators:

- SPI 3102.1.1 Interpret patterns found in sequences, tables, and other forms of quantitative information using variables or function notation.
- SPI 3102.1.2 Write an equation symbolically to express a contextual problem.
- SPI 3102.1.3 Apply properties to evaluate expressions, simplify expressions, and justify solutions to problems.
- SPI 3102.1.4 Translate between representations of functions that depict real-world situations.
- SPI 3102.1.5 Recognize and express the effect of changing constants and/or coefficients in problem solving.
- SPI 3102.1.6 Determine and interpret slope in multiple contexts including rate of change in real-world problems.

Standard 2 – Number & Operations

Grade Level Expectations:

- CLE 3102.2.1 Understand computational results and operations involving real numbers in multiple representations.
- CLE 3102.2.2 Understand properties of and relationships between subsets and elements of the real number system.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3102.2.1 Recognize and use like terms to simplify expressions.

- ✓ 3102.2.2 Apply the order of operations to simplify and evaluate algebraic expressions.
- ✓ 3102.2.3 Operate with and simplify radicals (index 2, 3, n) and radical expressions including rational numbers and variables in the radicand.
- ✓ 3102.2.4 Operate efficiently with both rational and irrational numbers.
- ✓ 3102.2.5 Perform operations with numbers in scientific notation (multiply, divide, powers).
- ✓ 3102.2.6 Use appropriate technologies to apply scientific notation to real-world problems.
- ✓ 3102.2.7 Identify the subsets in the real number system and understand their relationships.
- ✓ 3102.2.8 Use multiple strategies to approximate the value of an irrational number including irrational square roots and including location on the real number line.

State Performance Indicators:

- SPI 3102.2.1 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.
- SPI 3102.2.2 Multiply, divide, and square numbers expressed in scientific notation.
- SPI 3102.2.3 Describe and/or order a given set of real numbers including both rational and irrational numbers.

Standard 3 – Algebra

Grade Level Expectations:

- CLE 3102.3.1 Use algebraic thinking to analyze and generalize patterns.
- CLE 3102.3.2 Understand and apply properties in order to perform operations with, evaluate, simplify, and factor expressions and polynomials.
- CLE 3102.3.3 Understand and apply operations with rational expressions and equations.
- CLE 3102.3.4 Solve problems involving linear equations and linear inequalities.
- CLE 3102.3.5 Manipulate formulas and solve literal equations.
- CLE 3102.3.6 Understand and use relations and functions in various representations to solve contextual problems.
- CLE 3102.3.7 Construct and solve systems of linear equations and inequalities in two variables by various methods.
- CLE 3102.3.8 Solve and understand solutions of quadratic equations with real roots.
- CLE 3102.3.9 Understand and use exponential functions to solve contextual problems.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3102.3.1 Recognize and extend arithmetic and geometric sequences.
- ✓ 3102.3.2 Explore patterns including Pascal’s Triangle and the Fibonacci sequence.
- ✓ 3102.3.3 Justify correct results of algebraic procedures using extension of properties of real numbers to algebraic expressions.

- ✓ 3102.3.4 Simplify expressions using exponent rules including negative exponents and zero exponents.
- ✓ 3102.3.5 Add, subtract, and multiply polynomials including squaring a binomial.
- ✓ 3102.3.6 Find the quotient of a polynomial and a monomial.
- ✓ 3102.3.7 Use various models (including area models) to represent products of polynomials.
- ✓ 3102.3.8 Find the GCF of the terms in a polynomial.
- ✓ 3102.3.9 Find two binomial factors of a quadratic expression.
- ✓ 3102.3.10 Add, subtract, multiply, and divide rational expressions and simplify results.
- ✓ 3102.3.11 Solve multi-step linear equations with one variable.
- ✓ 3102.3.12 Recognize and articulate when an equation has no solution, a single solution, or all real numbers as solutions.
- ✓ 3102.3.13 Solve multi-step linear inequalities with one variable and graph the solution on a number line.
- ✓ 3102.3.14 Solve absolute value equations and inequalities (including compound inequalities) with one variable and graph their solutions on a number line.
- ✓ 3102.3.15 Determine domain and range of a relation and articulate restrictions imposed either by the operations or by the real life situation that the function represents.
- ✓ 3102.3.16 Determine if a relation is a function from its graph or from a set of ordered pairs.
- ✓ 3102.3.17 Recognize “families” of functions.
- ✓ 3102.3.18 Analyze the characteristics of graphs of basic linear relations and linear functions including constant function, direct variation, identity function, vertical lines, absolute value of linear functions. Use technology where appropriate.
- ✓ 3102.3.19 Explore the characteristics of graphs of various nonlinear relations and functions including inverse variation, quadratic, and square root function. Use technology where appropriate.
- ✓ 3102.3.20 Understand that a linear equation has a constant rate of change called slope and represent slope in various forms.
- ✓ 3102.3.21 Determine the equation of a line using given information including a point and slope, two points, a point and a line parallel or perpendicular, graph, intercepts.
- ✓ 3102.3.22 Express the equation of a line in standard form, slope-intercept, and point-slope form.
- ✓ 3102.3.23 Determine the graph of a linear equation including those that depict contextual situations.
- ✓ 3102.3.24 Interpret the changes in the slope-intercept form and graph of a linear equation by looking at different parameters, m and b in the slope-intercept form.
- ✓ 3102.3.25 Find function values using $f(x)$ notation or graphs.
- ✓ 3102.3.26 Graph linear inequalities on the coordinate plane and identify regions of the graph containing ordered pairs in the solution.

- ✓ 3102.3.27 Determine the number of solutions for a system of linear equations (0, 1, or infinitely many solutions).
- ✓ 3102.3.28 Solve systems of linear equations graphically, algebraically, and with technology.
- ✓ 3102.3.29 Solve contextual problems involving systems of linear equations or inequalities and interpret solutions in context.
- ✓ 3102.3.30 Solve quadratic equations using multiple methods: factoring, graphing, quadratic formula, or square root principle.
- ✓ 3102.3.31 Determine the number of real solutions for a quadratic equation including using the discriminant and its graph.
- ✓ 3102.3.32 Recognize the connection among factors, solutions (roots), zeros of related functions, and x-intercepts in equations that arise from quadratic functions.
- ✓ 3102.3.33 Recognize data that can be modeled by an exponential function.
- ✓ 3102.3.34 Graph exponential functions in the form $y = a(b^x)$ where $b \neq 0$.
- ✓ 3102.3.35 Apply growth/decay and simple/compound interest formulas to solve contextual problems.

State Performance Indicators:

- SPI 3102.3.1 Express a generalization of a pattern in various representations including algebraic and function notation.
- SPI 3102.3.2 Operate with polynomials and simplify results.
- SPI 3102.3.3 Factor polynomials.
- SPI 3102.3.4 Operate with, evaluate, and simplify rational expressions including determining restrictions on the domain of the variables.
- SPI 3102.3.5 Write and/or solve linear equations, inequalities, and compound inequalities including those containing absolute value.
- SPI 3102.3.6 Interpret various relations in multiple representations.
- SPI 3102.3.7 Determine domain and range of a relation, determine whether a relation is a function and/or evaluate a function at a specified rational value.
- SPI 3102.3.8 Determine the equation of a line and/or graph a linear equation.
- SPI 3102.3.9 Solve systems of linear equation/inequalities in two variables.
- SPI 3102.3.10 Find the solution of a quadratic equation and/or zeros of a quadratic function.
- SPI 3102.3.11 Analyze nonlinear graphs including quadratic and exponential functions that model a contextual situation.

Standard 4 – Geometry & Measurement

Grade Level Expectations:

- CLE 3102.4.1 Use algebraic reasoning in applications involving geometric formulas and contextual problems.
- CLE 3102.4.2 Apply appropriate units of measure and convert measures in problem solving situations.

Check for Understanding (Formative/Summative Assessment)

- ✓ 3102.4.1 Using algebraic expressions solve for measures in geometric figures as well as for perimeter, area, and volume.
- ✓ 3102.4.2 Use the Pythagorean Theorem to find the missing measure in a right triangle including those from contextual situations.
- ✓ 3102.4.3 Understand horizontal/vertical distance in a coordinate system as absolute value of the difference between coordinates; develop the distance formula for a coordinate plane using the Pythagorean Theorem.
- ✓ 3102.4.4 Develop the midpoint formula for segments on a number line or in the coordinate plane.
- ✓ 3102.4.5 Use dimensional analysis to convert rates and measurements both within a system and between systems and check the appropriateness of the solution.

State Performance Indicators:

- SPI 3102.4.1 Develop and apply strategies to estimate the area of any shape on a plane grid.
- SPI 3102.4.2 Solve contextual problems using the Pythagorean Theorem.
- SPI 3102.4.3 Solve problems involving the distance between points or midpoint of a segment.
- SPI 3102.4.4 Convert rates and measurements.

Standard 5 – Data Analysis, Statistics, & Probability

Grade Level Expectations:

- CLE 3102.5.1 Describe and interpret quantitative information.
- CLE 3102.5.2 Use statistical thinking to draw conclusions and make predictions.
- CLE 3102.5.3 Understand basic counting procedures and concepts of probability.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3102.5.1 Identify patterns or trends in data.
- ✓ 3102.5.2 Develop a meaning for and identify outliers in a data set and verify.
- ✓ 3102.5.3 When a set of data is changed, identify effects on measures of central tendency, range, and inter-quartile range.
- ✓ 3102.5.4 Explore quartiles, deciles, and percentiles of a distribution.
- ✓ 3102.5.5 Construct and interpret various forms of data representations, (including line graphs, bar graphs, circle graphs, histograms, scatter-plots, box-and-whiskers, stem-and-leaf, and frequency tables).
- ✓ 3102.5.6 Draw qualitative graphs of functions and describe a general trend or shape.
- ✓ 3102.5.7 Compare two data sets using graphs and descriptive statistics.
- ✓ 3102.5.8 Examine real-world graphical relationship (including scatter-plots) to determine type of relationship (linear or nonlinear) and any association (positive, negative or none) between the variables of the data set.

- ✓ 3102.5.9 Determine an equation for a line that fits real-world linear data; interpret the meaning of the slope and y-intercept in context of the data.
- ✓ 3102.5.10 Using technology with a set of contextual linear data to examine the line of best fit; determine and interpret the correlation coefficient.
- ✓ 3102.5.11 Use an equation that fits data to make a prediction.
- ✓ 3102.5.12 Use techniques (Venn Diagrams, tree diagrams, or counting procedures) to identify the possible outcomes of an experiment or sample space and compute the probability of an event.
- ✓ 3102.5.13 Determine the complement of an event and the probability of that complement.
- ✓ 3102.5.14 Determine if two events are independent or dependent.
- ✓ 3102.5.15 Explore joint and conditional probability.
- ✓ 3102.5.16 Identify situations for which the Law of Large Numbers applies.
- ✓ 3102.5.17 Perform simulations to estimate probabilities.
- ✓ 3102.5.18 Make informed decisions about practical situations using probability concepts.

State Performance Indicators:

- SPI 3102.5.1 Interpret displays of data to answer questions about the data set(s) (e.g., identify pattern, trends, and/or outliers in a data set).
- SPI 3102.5.2 Identify the effect on mean, median, mode, and range when values in the data set are changed.
- SPI 3102.5.3 Using a scatter-plot, determine if a linear relationship exists and describe the association between variables.
- SPI 3102.5.4 Generate the equation of a line that fits linear data and use it to make a prediction.
- SPI 3102.5.5 Determine theoretical and/or experimental probability of an event and/or its complement including using relative frequency.

Tennessee Mathematics Standards

Geometry

Standard 1 – Mathematical Processes

Course Level Expectations:

- CLE 3108.1.1 Use mathematical language, symbols, definitions, proofs and counterexamples correctly and precisely in mathematical reasoning.
- CLE 3108.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including testing cases, estimation, and then checking induced errors and the reasonableness of the solution.
- CLE 3108.1.3 Develop inductive and deductive reasoning to independently make and evaluate mathematical arguments and construct appropriate proofs; include various types of reasoning, logic, and intuition.
- CLE 3108.1.4 Move flexibly between multiple representations (contextual, physical written, verbal, iconic/pictorial, graphical, tabular, and symbolic), to solve problems, to model mathematical ideas, and to communicate solution strategies.
- CLE 3108.1.5 Recognize and use mathematical ideas and processes that arise in different settings, with an emphasis on formulating a problem in mathematical terms, interpreting the solutions, mathematical ideas, and communication of solution strategies.
- CLE 3108.1.6 Employ reading and writing to recognize the major themes of mathematical processes, the historical development of mathematics, and the connections between mathematics and the real world.
- CLE 3108.1.7 Use technologies appropriately to develop understanding of abstract mathematical ideas, to facilitate problem solving, and to produce accurate and reliable models.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3108.1.1 Check solutions after making reasonable estimates in appropriate units of quantities encountered in contextual situations.
- ✓ 3108.1.2 Determine position using spatial sense with two and three-dimensional coordinate systems.
- ✓ 3108.1.3 Comprehend the concept of length on the number line.
- ✓ 3108.1.4 Recognize that a definition depends on undefined terms and on previous definitions.
- ✓ 3108.1.5 Use technology, hands-on activities, and manipulatives to develop the language and the concepts of geometry, including specialized vocabulary (e.g. graphing calculators, interactive geometry software such as Geometer's Sketchpad and Cabri, algebra tiles, pattern blocks, tessellation tiles, MIRAs, mirrors, spinners, geoboards, conic section models, volume

- demonstration kits, Polydrons, measurement tools, compasses, PentaBlocks, pentominoes, cubes, tangrams).
- ✓ 3108.1.6 Use inductive reasoning to write conjectures and/or conditional statements.
 - ✓ 3108.1.7 Recognize the capabilities and the limitations of calculators and computers in solving problems.
 - ✓ 3108.1.8 Understand how the similarity of right triangles allows the trigonometric functions sine, cosine, and tangent to be defined as ratio of sides.
 - ✓ 3108.1.9 Expand analysis of units of measure to include area and volume.
 - ✓ 3108.1.10 Use visualization, spatial reasoning, and geometric modeling to solve problems.
 - ✓ 3108.1.11 Identify and sketch solids formed by revolving two-dimensional figures around lines.
 - ✓ 3108.1.12 Connect the study of geometry to the historical development of geometry.
 - ✓ 3108.1.13 Use proofs to further develop and deepen the understanding of the study of geometry (e.g. two-column, paragraph, flow, indirect, coordinate).
 - ✓ 3108.1.14 Identify and explain the necessity of postulates, theorems, and corollaries in a mathematical system.

State Performance Indicators:

- SPI 3108.1.1 Give precise mathematical descriptions or definitions of geometric shapes in the plane and space.
- SPI 3108.1.2 Determine areas of planar figures by decomposing them into simpler figures without a grid.
- SPI 3108.1.3 Use geometric understanding and spatial visualization of geometric solids to solve problems and/or create drawings.
- SPI 3108.1.4 Use definitions, basic postulates, and theorems about points, lines, angles, and planes to write/complete proofs and/or to solve problems.

Standard 2 – Number & Operations

Course Level Expectations:

- CLE3108.2.1 Establish the relationships between the real numbers and geometry; explore the importance of irrational numbers to geometry.
- CLE3108.2.2 Explore vectors as a numeric system, focusing on graphic representations and the properties of the operation.
- CLE3108.2.3 Establish an ability to estimate, select appropriate units, evaluate accuracy of calculations and approximate error in measurement in geometric settings.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3108.2.1 Analyze properties and aspects of pi (e.g. classical methods of approximating pi, irrational numbers, Buffon’s needle, use of dynamic geometry software).

- ✓ 3108.2.2 Approximate pi from a table of values for the circumference and diameter of circles using various methods (e.g. line of best fit).
- ✓ 3108.2.3 Recognize and apply real number properties to vector operations and geometric proofs (e.g. reflexive, symmetric, transitive, addition, subtraction, multiplication, division, distributive, and substitution properties).
- ✓ 3108.2.4 Add vectors graphically and algebraically.
- ✓ 3108.2.5 Multiply a vector by a scalar graphically and algebraically.
- ✓ 3108.2.6 Analyze precision, accuracy, and approximate error in measurement situations.

State Performance Indicators:

- SPI 3108.2.1 Analyze, apply, or interpret the relationships between basic number concepts and geometry (e.g. rounding and pattern identification in measurement, the relationship of pi to other rational and irrational numbers)
- SPI 3108.2.2 Perform operations on vectors in various representations.

Standard 3 – Algebra

Course Level Expectations:

- CLE 3108.3.1 Use analytic geometry tools to explore geometric problems involving parallel and perpendicular lines, circles, and special points of polygons.
- CLE 3108.3.2 Explore the effect of transformations on geometric figures and shapes in the coordinate plane.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3108.3.1 Prove two lines are parallel, perpendicular, or oblique using coordinate geometry.
- ✓ 3108.3.2 Connect coordinate geometry to geometric figures in the plane (e.g. midpoints, distance formula, slope, and polygons).
- ✓ 3108.3.3 Find the equation of a circle given its center and radius and vice versa.
- ✓ 3108.3.4 Apply the midpoint and distance formulas to points and segments to find midpoints, distances, and missing information in two and three dimensions.
- ✓ 3108.3.5 Use mapping notation to identify the image of a transformation given the coordinates of the pre-image.
- ✓ 3108.3.6 Identify a transformation given its mapping notation.

State Performance Indicators:

- SPI 3108.3.1 Use algebra and coordinate geometry to analyze and solve problems about geometric figures (including circles).
- SPI 3108.3.2 Use coordinate geometry to prove characteristics of polygonal figures.

- SPI 3108.3.3 Describe algebraically the effect of a single transformation (reflections in the x- or y-axis, rotations, translations, and dilations) on two-dimensional geometric shapes in the coordinate plane.

Standard 4 – Geometry & Measurement

Course Level Expectations:

- CLE 3108.4.1 Develop the structures of geometry, such as lines, angles, planes, and planar figures, and explore their properties and relationships.
- CLE 3108.4.2 Describe the properties of regular polygons, including comparative classification of them and special points and segments.
- CLE 3108.4.3 Develop an understanding of the tools of logic and proof, including aspects of formal logic as well as construction of proofs.
- CLE 3108.4.4 Develop geometric intuition and visualization through performing geometric constructions with straightedge/compass and with technology.
- CLE 3108.4.5 Extend the study of planar figures to three-dimensions, including the classical solid figures, and develop analysis through cross-sections.
- CLE 3108.4.6 Generate formulas for perimeter, area, and volume, including their use, dimensional analysis, and applications.
- CLE 3108.4.7 Apply the major concepts of transformation geometry to analyzing geometric objects and symmetry.
- CLE 3108.4.8 Establish processes for determining congruence and similarity of figures, especially as related to scale factor, contextual applications, and transformations.
- CLE 3108.4.9 Develop the role of circles in geometry, including angle measurement, properties as a geometric figure, and aspects relating to the coordinate plane.
- CLE 3108.4.10 Develop the tools of right triangle trigonometry in the contextual applications, including the Pythagorean Theorem, Law of Sines and Law of Cosines

Check for Understanding (Formative/Summative Assessment):

- ✓ 3108.4.1 Recognize that there are geometries, other than Euclidean geometry, in which the parallel postulate is not true and discuss unique properties of each.
- ✓ 3108.4.2 Compare and contrast inductive reasoning and deductive reasoning for making predictions and valid conclusions based on contextual situations.
- ✓ 3108.4.3 Solve problems involving betweenness of points and distance between points (including segment addition).
- ✓ 3108.4.4 Describe and recognize minimal conditions necessary to define geometric objects.
- ✓ 3108.4.5 Use vertical, adjacent, complementary, and supplementary angle pairs to solve problems and write proofs.
- ✓ 3108.4.6 Describe the intersection of lines (in the plane and in space), a line and a plane, or of two planes.

- ✓ 3108.4.7 Identify perpendicular planes, parallel planes, a line parallel to a plane, skew lines, and a line perpendicular to a plane.
- ✓ 3108.4.8 Apply properties and theorems about angles associated with parallel and perpendicular lines to solve problems.
- ✓ 3108.4.9 Classify triangles, quadrilaterals, and polygons (regular, non-regular, convex and concave) using their properties.
- ✓ 3108.4.10 Identify and apply properties and relationships of special figures (e.g., isosceles and equilateral triangles, family of quadrilaterals, polygons, and solids).
- ✓ 3108.4.11 Use the triangle inequality theorems (e.g., Exterior Angle Inequality Theorem, Hinge Theorem, SSS Inequality Theorem, Triangle Inequality Theorem) to solve problems.
- ✓ 3108.4.12 Apply the Angle Sum Theorem for polygons to find interior and exterior angle measures given the number of sides, to find the number of sides given angle measures, and to solve contextual problems.
- ✓ 3108.4.13 Locate, describe, and draw a locus in a plane or space (e.g., fixed distance from a point on a plane, fixed distance from a point in space, fixed distance from a line, equidistant from two points, equidistant from two parallel lines, and equidistant from two intersecting lines).
- ✓ 3108.4.14 Identify and use medians, midsegments, altitudes, angle bisectors, and perpendicular bisectors of triangles to solve problems (e.g., find segment lengths, angle measures, points of concurrency).
- ✓ 3108.4.15 Identify, write, and interpret conditional and bi-conditional statements along with the converse, inverse, and contra-positive of a conditional statement.
- ✓ 3108.4.16 Analyze and create truth tables to evaluate conjunctions, disjunctions, conditionals, inverses, contra-positives, and bi-conditionals.
- ✓ 3108.4.17 Use the Law of Detachment, Law of Syllogism, conditional statements, and bi-conditional statements to draw conclusions.
- ✓ 3108.4.18 Use counterexamples, when appropriate, to disprove a statement.
- ✓ 3108.4.19 Use coordinate geometry to prove properties of plane figures.
- ✓ 3108.4.20 Prove key basic theorems in geometry (i.e., Pythagorean Theorem, the sum of the angles of a triangle is 180 degrees, characteristics of quadrilaterals, and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length).
- ✓ 3108.4.21 Use properties of and theorems about parallel lines, perpendicular lines, and angles to prove basic theorems in Euclidean geometry (e.g., two lines parallel to a third line are parallel to each other, the perpendicular bisectors of line segments are the set of all points equidistant from the endpoints, and two lines are parallel when the alternate interior angles they make with a transversal are congruent).
- ✓ 3108.4.22 Perform basic geometric constructions using a straight edge and a compass, paper folding, graphing calculator programs, and computer software packages (i.e., bisect and trisect segments, congruent angles, congruent segments, a line parallel to a given line through a point not on the line, angle bisector, and perpendicular bisector).

- ✓ 3108.4.23 Describe the polyhedron or solid that can be made from a given net including the Platonic Solids.
- ✓ 3108.4.24 Develop and use special formulas relating to polyhedra (e.g., Euler's Formula).
- ✓ 3108.4.25 Use properties of prisms, pyramids, cylinders, cones, spheres, and hemispheres to solve problems.
- ✓ 3108.4.26 Describe and draw cross-sections (including the conic sections) of prisms, cylinders, pyramids, spheres, and cones.
- ✓ 3108.4.27 Use right triangle trigonometry to find the area and perimeter of quadrilaterals (e.g. square, rectangle, rhombus, parallelogram, trapezoid, and kite).
- ✓ 3108.4.28 Derive and use the formulas for the area and perimeter of a regular polygon. ($A = \frac{1}{2} ap$)
- ✓ 3108.4.29 Extend the effect of a scale factor k in similar objects to include the impact on volume calculations and transformations.
- ✓ 3108.4.30 Use right triangle trigonometry to find the lateral area (if possible), surface area, and volume of prisms, cylinders, cones, pyramids, spheres, and hemispheres.
- ✓ 3108.4.31 Use properties of single transformations and compositions of transformations to determine their effect on geometric figures (e.g. reflections across lines of symmetry, rotations, translations, glide reflections, and dilations).
- ✓ 3108.4.32 Recognize, identify and apply types of symmetries (point, line, rotational) of two- and three- dimensional figures.
- ✓ 3108.4.33 Use transformations to create and analyze tessellations and investigate the use of tessellations in architecture, mosaics, and artwork.
- ✓ 3108.4.34 Create and analyze geometric designs using rigid motions (compositions of reflections, translations, and rotations).
- ✓ 3108.4.35 Prove that two triangles are congruent by applying the SSS, SAS, ASA, AAS, and HL congruence statements.
- ✓ 3108.4.36 Use several methods, including AA, SSS, and SAS, to prove that two triangles are similar.
- ✓ 3108.4.37 Identify similar figures and use ratios and proportions to solve mathematical and real-world problems (e.g., Golden Ratio).
- ✓ 3108.4.38 Use the principle that corresponding parts of congruent triangles are congruent to solve problems.
- ✓ 3108.4.39 Identify lines and line segments associated with circles.
- ✓ 3108.4.40 Find angle measures, intercepted arc measures, and segment lengths formed by radii, chords, secants, and tangents intersecting inside and outside circles.
- ✓ 3108.4.41 Use inscribed and circumscribed polygons to solve problems concerning segment length and angle measures.
- ✓ 3108.4.42 Use geometric mean to solve problems involving relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.

- ✓ 3108.4.43 Apply the Pythagorean Theorem and its converse to triangles to solve mathematical and contextual problems in two- or three-dimensional situations.
- ✓ 3108.4.44 Identify and use Pythagorean triples in right triangles to find lengths of an unknown side in two- or three-dimensional situations.
- ✓ 3108.4.45 Use the converse of the Pythagorean Theorem to classify a triangle by its angles (right, acute, or obtuse).
- ✓ 3108.4.46 Apply properties of $30^\circ - 60^\circ - 90^\circ$ and $45^\circ - 45^\circ - 90^\circ$ to determine side lengths of triangles.
- ✓ 3108.4.47 Find the sine, cosine and tangent ratios of an acute angle of a right triangle given the side lengths.
- ✓ 3108.4.48 Define, illustrate, and apply angles of elevation and angles of depression in real-world situations.
- ✓ 3108.4.49 Use the Law of Sines (excluding the ambiguous case) and the Law of Cosines to find missing side lengths and/or angle measures in non-right triangles.

State Performance Indicators:

- SPI 3108.4.1 Differentiate between Euclidean and non-Euclidean geometries.
- SPI 3108.4.2 Define, identify, describe, and/or model plane figures using appropriate mathematical symbols (including collinear and non-collinear points, lines, segments, rays, angles, triangles, quadrilaterals, and other polygons).
- SPI 3108.4.3 Identify, describe and/or apply the relationships and theorems involving different types of triangles, quadrilaterals and other polygons.
- SPI 3108.4.4 Analyze different types and formats of proofs.
- SPI 3108.4.5 Describe solids and/or surfaces in three-dimensional space when given two-dimensional representations for the surfaces of three-dimensional objects.
- SPI 3108.4.6 Use various area of triangle formulas to solve contextual problems (e.g., Heron's formula, the area formula for an equilateral triangle and $A = \frac{1}{2} ab \sin C$).
- SPI 3108.4.7 Compute the area and/or perimeter of triangles, quadrilaterals and other polygons when one or more additional steps are required (e.g. find missing dimensions given area or perimeter of the figure, using trigonometry).
- SPI 3108.4.8 Solve problems involving area, circumference, area of a sector, and/or arclength of a circle.
- SPI 3108.4.9 Use right triangle trigonometry and cross-sections to solve problems involving surface areas and/or volumes of solids.
- SPI 3108.4.10 Identify, describe, and/or apply transformations on two and three dimensional geometric shapes.
- SPI 3108.4.11 Use basic theorems about similar and congruent triangles to solve problems.
- SPI 3108.4.12 Solve problems involving congruence, similarity, proportional reasoning and/or scale factor of two similar figures or solids.
- SPI 3108.4.13 Identify, analyze and/or use basic properties and theorems of circles to solve problems (including those relating right triangles and circles).

- SPI 3108.4.14 Use properties of right triangles to solve problems (such as involving the relationship formed when the altitude to the hypotenuse of a right triangle is drawn).
- SPI 3108.4.15 Determine and use the appropriate trigonometric ratio for a right triangle to solve a contextual problem.

Standard 5 – Data Analysis, Statistics, & Probability

Course Level Expectations:

- CLE 3108.5.1 Analyze, interpret, employ and construct accurate statistical graphs.
- CLE 3108.5.2 Develop the basic principles of geometric probability.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3108.5.1 Determine the area of each sector and the degree measure of each intercepted arc in a pie chart.
- ✓ 3108.5.2 Translate from one representation of data to another (e.g., bar graph to pie graph, pie graph to bar graph, table to pie graph, pie graph to chart) accurately using the area of a sector.
- ✓ 3108.5.3 Estimate or calculate simple geometric probabilities (e.g., number line, area model, using length, circles).

State Performance Indicators:

- SPI 3108.5.1 Use area to solve problems involving geometric probability (e.g. dartboard problem, shaded sector of a circle, shaded region of a geometric figure).

Tennessee Mathematics Standards

Algebra II

Standard 1 – Mathematical Processes

Woven throughout the content of Algebra II in terms of Number & Operations, Algebra, Geometry, and Data Analysis, Probability, and Statistics are the following mathematical process skills:

- CLE 3103.1.1 Use mathematical language, symbols, definitions, proofs and counterexamples correctly and precisely in mathematical reasoning.
- CLE 3103.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including testing cases, estimation, and then checking induced errors and the reasonableness of the solution.
- CLE 3103.1.3 Develop inductive and deductive reasoning to independently make and evaluate mathematical arguments and construct appropriate proofs; include various types of reasoning, logic, and intuition.
- CLE 3103.1.4 Move flexibly between multiple representations (contextual, physical, written, verbal, iconic/pictorial, graphical, tabular, and symbolic), to solve problems, to model mathematical ideas, and to communicate solution strategies.
- CLE 3103.1.5 Recognize and use mathematical ideas and processes that arise in different settings, with an emphasis on formulating a problem in mathematical terms, interpreting the solutions, mathematical ideas, and communication of solution strategies.
- CLE 3103.1.6 Employ reading and writing to recognize the major themes of mathematical processes, the historical development of mathematics, and the connections between mathematics and the real world.
- CLE 3103.1.7 Use technologies appropriately to develop understanding of abstract mathematical ideas, to facilitate problem solving, and to produce accurate and reliable models.

Checks for Understanding (Formative/Summative Assessment):

- ✓ 3103.1.1 Create and analyze scatter-plots of non-linear and transcendental functions.
- ✓ 3103.1.2 Compare and contrast sampling techniques and identify the best technique for a given situation.
- ✓ 3103.1.3 Use calculators to identify regression equations for nonlinear data.
- ✓ 3103.1.4 Identify the weaknesses of calculators and other technologies in representing non-linear data, such as graphs approaching vertical asymptotes, and use alternative techniques to identify these issues and correctly solve problems.
- ✓ 3103.1.5 Determine the accuracy and reliability of a mathematical model.

- ✓ 3103.1.6 Use graphical representations to perform operations on complex numbers.
- ✓ 3103.1.7 Use the unit circle to determine the exact value of trigonometric functions for commonly used angles (0° , 30° , 45° , 60° ...).
- ✓ 3103.1.8 Understand and describe the inverse relationship between exponential and logarithmic functions.
- ✓ 3103.1.9 Translate the syntax of technology to appropriate mathematical notation for non-linear and transcendental functions.
- ✓ 3103.1.10 Interpret the results of mathematical modeling in various contexts to answer questions.

State Performance Indicators:

- SPI 3103.1.1 Move flexibly between multiple representations (contextual, physical, written, verbal, iconic/pictorial, graphical, tabular, and symbolic) of non-linear and transcendental functions to solve problems, to model mathematical ideas, and to communicate solution strategies.
- SPI 3103.1.2 Recognize and describe errors in data collection and analysis as well as identifying representations of data as being accurate or misleading.
- SPI 3103.1.3 Use technology tools to identify and describe patterns in data using non-linear and transcendental functions that approximate data as well as using those functions to solve contextual problems.
- SPI 3103.1.4 Use mathematical language, symbols, definitions, proofs and counterexamples correctly and precisely to effectively communicate reasoning in the process of solving problems via mathematical modeling with both linear and non-linear functions.

Standard 2 – Number & Operations

Numbers and operations are our main tools for describing the world qualitatively. Previous knowledge of the real number system, various representations, problem solving skills, connections, and the ability to communicate mathematically and exhibit number sense are extended in Algebra II.

- CLE 3103.2.1 Understand the hierarchy of the complex number system and relationships between the elements, properties and operations.
- CLE 3103.2.2 Connect numeric, analytic, graphical and verbal representations of both real and complex numbers.
- CLE 3103.2.3 Use appropriate technology (including graphing calculators and computer spreadsheets) to solve problems, recognize patterns and collect and analyze data.
- CLE 3103.2.4 Understand the capabilities and limitations of technology when performing operations, graphing, and solving equations involving complex numbers.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3103.2.1 Understand that to solve certain problems and equations, the real number system needs to be extended from real numbers to complex numbers.

- ✓ 3103.2.2 Define and give examples of each of the types of numbers in the complex number system.
- ✓ 3103.2.3 Identify and apply properties of complex numbers (including simplification and standard form).
- ✓ 3103.2.4 Add and subtract complex numbers.
- ✓ 3103.2.5 Multiply complex numbers.
- ✓ 3103.2.6 Define and utilize the complex conjugates to write the quotient of two complex numbers in standard form.
- ✓ 3103.2.7 Graph complex numbers in the complex plane and recognize differences and similarities with the graphical representations of real numbers graphed on the number line.
- ✓ 3103.2.8 Solve quadratic equations over the complex number system.
- ✓ 3103.2.9 Find and describe geometrically the absolute value of a complex number.
- ✓ 3103.2.10 Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers over complex numbers.
- ✓ 3103.2.11 Understand the capabilities and limitations of technology. Make estimations without a calculator to detect potential errors.
- ✓ 3103.2.12 Select and use appropriate methods to make estimations without technology when solving contextual problems.
- ✓ 3103.2.13 Analyze and evaluate contextual situations involving any type of number from the complex number system.

State Performance Indicators:

- SPI 3103.2.1 Describe any number in the complex number system.
- SPI 3103.2.2 Compute with all real and complex numbers.
- SPI 3103.2.3 Use the number system, from real to complex, to solve equations and contextual problems.

Standard 3 – Algebra

Algebra reaches from the foundations of mathematics to the frontiers of current research. It is a powerful representational tool and a vehicle for comprehensive concepts such as functions. By continuing to develop the properties of algebra and functions, Algebra II enhances the problem-solving process started in Algebra I with emphasis on non-linear functions. Contextual situations can be modeled by understanding and applying the algebraic concepts of equations, systems of equations, and inequalities, basic relations and functions, polynomials, conics, and exponential functions.

- CLE 3103.3.1 Understand and apply properties of rational exponents and perform basic operations to simplify algebraic expressions.
- CLE 3103.3.2 Understand, analyze, transform and generalize mathematical patterns, relations and functions using properties and various representations.
- CLE 3103.3.3 Analyze and apply various methods to solve equations, absolute values, inequalities, and systems of equations over complex numbers.

- CLE 3103.3.4 Graph and compare equations and inequalities in two variables. Identify and understand the relationships between the algebraic and geometric properties of the graph.
- CLE 3103.3.5 Use mathematical models involving equations and systems of equations to represent, interpret and analyze quantitative relationships, change in various contexts, and other real-world phenomena.

Check for Understanding (Formative/Summative Assessment)

- ✓ 3103.3.1 Perform operations on algebraic expressions and justify the procedures.
- ✓ 3103.3.2 Determine the domain of a function represented in either symbolic or graphical form.
- ✓ 3103.3.3 Determine and graph the inverse of a function with and without technology.
- ✓ 3103.3.4 Analyze the effect of changing various parameters on functions and their graphs.
- ✓ 3103.3.5 Graph piece-wise and step functions.
- ✓ 3103.3.6 Simplify expressions and solve equations containing radicals.
- ✓ 3103.3.7 Solve quadratic equations by factoring, graphing, completing the square, extracting square roots and using the quadratic formula.
- ✓ 3103.3.8 Solve a three by three system of linear equations algebraically and by using inverse matrices and determinants with and without technology.
- ✓ 3103.3.9 Find an equation for a parabola when given its graph or when given its roots.
- ✓ 3103.3.10 Given a quadratic equation use the discriminant to determine the nature of the roots.
- ✓ 3103.3.11 Describe and articulate the characteristics and parameters of a parent function.
- ✓ 3103.3.12 Understand the relationship between real zeros of a function and the x-intercepts of its graph.
- ✓ 3103.3.13 Solve problems using exponential functions requiring the use of logarithms for their solutions.
- ✓ 3103.3.14 Define and use arithmetic and geometric sequences and series including using sigma and pi notation.
- ✓ 3103.3.15 Find the sum of an geometric series whose common ratio, r , is in the interval $(-1,1)$.
- ✓ 3103.3.16 Prove basic properties of logarithms using properties of exponents and apply those properties to solve problems.
- ✓ 3103.3.17 Know that the logarithm and exponential functions are inverses and use this information to solve real-world problems.
- ✓ 3103.3.18 Solve compound inequalities involving disjunction and conjunction and linear inequalities containing absolute values.
- ✓ 3103.3.19 Solve linear programming problems.
- ✓ 3103.3.20 Understand the relationships between the equations of conic sections and their graphs.

- ✓ 3103.3.21 Factor polynomials using a variety of methods including the factor theorem, synthetic division, long division, sums and differences of cubes, and grouping.
- ✓ 3103.3.22 Determine the number and possible types of zeros for a polynomial function and find the rational roots.
- ✓ 3103.3.23 Understand the connection between the roots, zeros, x-intercepts, factors of polynomials, and solutions of polynomial equations.

State Performance Indicators

- SPI 3103.3.1 Add, subtract and multiply polynomials; divide a polynomial by a lower degree polynomial.
- SPI 3103.3.2 Solve quadratic equations and systems, and determine roots of a higher order polynomial.
- SPI 3103.3.3 Add, subtract, multiply, divide and simplify rational expressions including those with rational and negative exponents.
- SPI 3103.3.4 Use the formulas for the general term and summation of finite arithmetic and both finite and infinite geometric series.
- SPI 3103.3.5 Describe the domain and range of functions and articulate restrictions imposed either by the operations or by the contextual situations which the functions represent.
- SPI 3103.3.6 Combine functions (such as polynomial, rational, radical and absolute value expressions) by addition, subtraction, multiplication, division, or by composition and evaluate at specified values of their variables.
- SPI 3103.3.7 Identify whether a function has an inverse, whether two functions are inverses of each other, and/or explain why their graphs are reflections over the line $y = x$.
- SPI 3103.3.8 Solve systems of three linear equations in three variables.
- SPI 3103.3.9 Graph the solution set of two or three linear or quadratic inequalities.
- SPI 3103.3.10 Identify and/or graph a variety of functions and their translations.
- SPI 3103.3.11 Graph conic sections (circles, parabolas, ellipses and hyperbolas) and understand the relationship between the standard form and the key characteristics of the graph.
- SPI 3103.3.12 Interpret graphs that depict real-world phenomena.
- SPI 3103.3.13 Solve contextual problems using quadratic, rational, radical and exponential equations, finite geometric series or systems of equations.
- SPI 3103.3.14 Solve problems involving the binomial theorem and its connection to Pascal's Triangle, combinatorics, and probability.

Standard 4 – Geometry & Measurement

Geometry uses knowledge of and the relationships between the trigonometric functions to solve real-world problems. Prior knowledge of the coordinate plane and trigonometry will be extended in Algebra Two. Trigonometric functions will be extended to periodic function on the real line. Formulas involving these functions will be derived and used to solve a variety of problems.

- CLE 3103.4.1 Understand the trigonometric functions and their relationship to the unit circle.
- CLE 3103.4.2 Know and use the basic identities of sine, cosine, and tangent as well as their reciprocals.
- CLE 3103.4.3 Graph all six trigonometric functions and identify their key characteristics.
- CLE 3103.4.4 Know and use the Law of Sines to find missing sides and angles of a triangle, including the ambiguous case.
- CLE 3103.4.5 Use trigonometric concepts, properties and graphs to solve problems.

Checks for Understanding (Formative/Summative Assessment):

- ✓ 3103.4.1 Convert between radians and degrees and vice versa.
- ✓ 3103.4.2 Determine the period and the amplitude of a periodic function.
- ✓ 3103.4.3 Extend the trigonometric functions to periodic functions on the real line by defining them as functions on the unit circle.
- ✓ 3103.4.4 Understand the relationship between the radius, the central angle, and radian measure.
- ✓ 3103.4.5 Determine the domain and range of the six trigonometric functions given a graph.
- ✓ 3103.4.6 Know and be able to use the fundamental trigonometric identities, including the Pythagorean identities, reciprocal identities, sum of sine and cosine, and odd and even identities.

State Performance Indicators:

- SPI 3103.4.1 Exhibit knowledge of unit circle trigonometry.
- SPI 3103.4.2 Match graphs of basic trigonometric functions with their equations.
- SPI 3103.4.3 Describe and articulate the characteristics and parameters of parent trigonometric functions to solve contextual problems.

Standard 5 – Data Analysis, Statistics, & Probability

Data analysis and statistics covers the entire process of collecting, organizing, summarizing, and interpreting data. Prior knowledge of data analysis will be extended in Algebra II, and students are expected to be able to use statistical models (linear and non-linear equations) to describe possible associations between measurement variables and be familiar with techniques for fitting models to data.

- CLE 3103.5.1 Describe, interpret, and apply quantitative data.
- CLE 3103.5.2 Evaluate and critique various ways of collecting data and using information based on data published in the media.
- CLE 3103.5.3 Use data and statistical thinking to draw inferences, make predictions, justify conclusions and identify and explain misleading uses of data.
- CLE 3103.5.4 Develop an understanding of probability concepts in order to make informed decisions.

Check for Understanding (Formative/Summative Assessment):

- ✓ 3103.5.1 Collect, represent and describe both linear and non-linear data developed from contextual situations.
- ✓ 3103.5.2 Organize and display data using appropriate methods (including spreadsheets and technology tools) to detect patterns and departures from patterns.
- ✓ 3103.5.3 Read and interpret data from a two-way table.
- ✓ 3103.5.4 Understand the impact of various sampling methods and use them to draw valid conclusions.
- ✓ 3103.5.5 Calculate measures of central tendency and spread (variance and standard deviation).
- ✓ 3103.5.6 Use technology to find the appropriate regression equation for both linear and non-linear data.
- ✓ 3103.5.7 Recognize when the correlation coefficient measures goodness of fit and does not imply causation.
- ✓ 3103.5.8 Know the Empirical Rule for one, two and three standard deviations for a normal distribution.
- ✓ 3103.5.9 Use data to detect patterns.
- ✓ 3103.5.10 Design simple experiments to collect data to answer questions of interest.
- ✓ 3103.5.11 Evaluate published data by considering the source, the design of the study and the analysis and representation (or misrepresentation) of the data.
- ✓ 3103.5.12 Investigate bias and the phrasing of questions during data acquisition to formulate reasonable conclusions.
- ✓ 3103.5.13 Apply both theoretical and experimental probability to analyze the likelihood of an event.

State Performance Indicators:

- SPI 3103.5.1 Compute, compare and explain summary statistics for distributions of data including measures of center and spread.
- SPI 3103.5.2 Compare data sets using graphs and summary statistics.
- SPI 3103.5.3 Analyze patterns in a scatter-plot and describe relationships in both linear and non-linear data.
- SPI 3103.5.4 Apply the characteristics of the normal distribution.
- SPI 3103.5.5 Determine differences between randomized experiments and observational studies.
- SPI 3103.5.6 Find the regression curve that best fits both linear and non-linear data (using technology such as a graphing calculator) and use it to make predictions.
- SPI 3103.5.7 Determine/recognize when the correlation coefficient measures goodness of fit.
- SPI 3103.5.8 Apply probability concepts such as conditional probability and independent events to calculate simple probability.