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Tennessee
Mathematics Standards
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I. Ways of Looking: Revisiting Concepts Students learn mathematics best by being introduced to concepts that they have previously studied in a new approach. The concepts in this section appear in a manner that emphasizes their basic definition. This presentation of each concept is based upon the format that would be a "best practice" of introducing the particular concept.	
3181.1.1 Diagrammatic Mathematics	
3181.1.1.1 Identify the graph of a linear inequality on the number line.	**SE: 18.7** Graphing Linear Inequalities in Two Variables, **35.2** Graphing Compound Inequalities, **35.3** Solving Compound Inequalities
3181.1.1.2 Create and use absolute value functions to model and solve problems in common settings.	**SE: 36.1** Introduction to Absolute Value Equations, **36.2** Solving Basic Absolute Value Equations, **36.3** Solving Multiple Absolute Value Equations, **36.4** Solving Absolute Value Inequalities
3181.1.1.3 Given an equation of a line, write an accurate definition of a line by determining the unique characteristics that define it (i.e. slope and intercepts).	**SE: 17.2** Graphing Linear Equations by Plotting Points, **17.3** Graphing Linear Equations Using Intercepts, **17.4** Graphing Linear Equations of the Form x=a, y=b, and y=mx, **17.5** Applications of Graphing Linear Equations, **18.1** The Slope of a Line, **18.2** Slope-Intercept Form, **18.3** Graphing Lines Using the Slope and y-Intercept, **18.4** Writing Equations of Lines Using a Point and Slope, **18.5** Writing Equations of Lines Using Two Points, **18.6** Writing Equations of Parallel and Perpendicular Lines, **19.5** Graphing Linear Functions
3181.1.1.4 Compute the perimeter of simple composite geometric figures with unknown side lengths.	**SE: 11.3** Perimeter - Definitions and Units, **11.4** Finding Perimeter
3181.1.1.5 Apply a variety of strategies to determine the circumference and the area for circles.	**SE: 11.8** Finding Circumference, **11.9** Finding Area - Circles
3181.1.1.6 Investigate the area of a sector and the arc length of a circle.	**SE: 11.7** Understanding Circles, **11.8** Finding Circumference, **11.9** Finding Area – Circles, **13.3** Circle Graphs,

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	E.2 Circle Properties
3181.1.2 Verbal Mathematics	
3181.1.2.1 Understand that a line parallel to one side of a triangle divides the other two proportionally, and conversely.	**SE: 11.1** Lines and Angles, **11.2** Figures, **12.8** Applications of Equations and Geometric Figures, **E.3** Triangle Side-Splitter Theorem
3181.1.2.2 Apply similar triangles to solve problems, such as finding heights and distances.	**SE: 12.5** Similar Figures, **12.6** Finding Missing Lengths
3181.1.2.3 Use several angle properties to find an unknown angle measure (i.e. supplementary, complementary, vertical, angles along a transversal, and sum of angles in a polygon).	**SE: 11.1** Lines and Angles, **11.2** Figures
3181.1.2.4 Describe, compare, and contrast plane and solid figures using their attributes.	**SE: 11.2** Figures, **11.3** Perimeter - Definitions and Units, **11.4** Finding Perimeter, **11.5** Area - Definitions and Units, **11.6** Finding Area, **11.7** Understanding Circles, **11.8** Finding Circumference, **11.9** Finding Area – Circles, **12.1** Volume - Definitions and Units, **12.2** Finding Volume, **12.3** Square Roots, **12.4** The Pythagorean Theorem, **12.5** Similar Figures, **12.6** Finding Missing Lengths, **12.7** Congruent Triangles
3181.1.2.5 Multiply, divide and simplify radicals.	**SE: 30.1** Square Roots, **30.2** Higher-Order Roots, **30.3** Simplifying Radical Expressions, **30.4** Rational Exponents, **30.5** More on The Pythagorean Theorem, **30.6** The Distance Formula, **31.2** Adding and Subtracting Radical Expressions, **31.3** Multiplying Radical Expressions, **31.4** Dividing Radical Expressions, **31.5** Rationalizing the Denominator, **31.6** Solving Radical Equations

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3181.1.2.6 Use mathematical grammar and appropriate mathematical symbols to represent contextual situations.	**SE: 1.5** Basic Problem Solving, **1.11** More Problem Solving, **3.5** Translating Words into Symbols, **4.6** Translating Words into Equations, **4.7** Applications of Equations, **15.3** Translating Words into Symbols and Equations, **19.6** Applications of Functions, **20.6** Applications of Systems of Linear Equations, **23.3** Scientific Notation, **25.5** Applications, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT, **29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation, **32.6** Applications with Quadratic Equations, **33.5** Complex and Quadratic Applications, **34.5** Applications with Quadratic Functions, **39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications, **39.6** Solving Simple Logarithmic Equations and Applications, **39.7** Solving Logarithmic Equations and Applications
3181.1.3 Symbolic Mathematics	
3181.1.3.1 Operations with numbers expressed in scientific notation.	**SE: 23.3** Scientific Notation
3181.1.3.2 Develop a thorough understanding of both rational and irrational numbers: make both historical and concrete connections between irrational numbers and the real world.	**SE: 14.1** Introduction to Real Numbers, **14.7** Properties of Real Numbers, **31.1** Introduction to Radical Functions, **31.2** Adding and Subtracting Radical Expressions, **31.3** Multiplying Radical Expressions, **31.4** Dividing Radical Expressions, **31.5** Rationalizing the

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	Denominator
3181.1.3.3 Use mathematical symbols and variables to express a relationship between quantities.	**SE: 3.1** Variables and Expressions, **3.2** Like Terms, **3.3** Distributing, **3.4** Simplifying Expressions, **3.5** Translating Words into Symbols, **4.1** Equations and Solutions, **4.6** Translating Words into Equations, **4.7** Applications of Equations, **9.5** Solving Equations Involving Fractions, **9.6** Solving Equations Involving Decimals, **10.7** The Percent Equation, **10.8** The Percent Proportion, **10.9** Percent Applications, **15.1** Evaluating Algebraic Expressions, **15.2** Simplifying Expressions, **15.3** Translating Words into Symbols and Equations, **15.4** Linear Equations and Solutions, **16.7** Applications of Linear Equations and Inequalities, **21.1** Introduction to Polynomials, **25.5** Applications, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT, **29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation, **38.3** Evaluating Exponential and Logarithmic Expressions
3181.1.3.4 Model a variety of problem situations with expressions.	**SE: 3.1** Variables and Expressions, **3.2** Like Terms, **3.3** Distributing, **3.4** Simplifying Expressions, **3.5** Translating Words into Symbols, **15.1** Evaluating Algebraic Expressions, **15.2** Simplifying Expressions, **15.3** Translating Words into Symbols and Equations, **29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation, **38.3** Evaluating Exponential and Logarithmic Expressions

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3181.1.3.5 Skillfully manipulate formulas involving exponents.	**SE: 21.4** Product Rule for Exponents, **21.5** Power Rule for Exponents, **23.2** Integer Exponents, **23.3** Scientific Notation, **30.4** Rational Exponents
3181.1.3.6 Understand how mathematical properties yield equivalent equations and can be used in determining if two expressions are equivalent.	**SE: 4.1** Equations and Solutions, **4.6** Translating Words into Equations, **4.7** Applications of Equations, **9.5** Solving Equations Involving Fractions, **9.6** Solving Equations Involving Decimals, **10.7** The Percent Equation, **15.3** Translating Words into Symbols and Equations, **15.4** Linear Equations and Solutions, **16.7** Applications of Linear Equations and Inequalities, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT, **29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation
3181.1.3.7 Perform polynomial arithmetic, including addition, subtraction, multiplying, dividing, factoring, and simplifying results.	**SE: 21.2** Addition of Polynomials, **21.3** Subtraction of Polynomials, **22.1** Multiplying by a Monomial, **22.2** Multiplying Binomials, **22.3** Multiplying Polynomials, **22.4** Multiplying the Sum and Difference of Two Terms, **22.5** Squaring Binomials, **23.4** Dividing a Polynomial by a Monomial, **23.5** Dividing a Polynomial by a Binomial, **24.1** Greatest Common Factor, **24.2** Factoring by Grouping, **24.3** Factoring Trinomials of the Form x^2+bx+c, **24.4** Factoring Trinomials of the Form ax^2+bx+c, **24.5** Factoring Trinomials by Grouping Numbers (the ac-Method), **24.6** More Factoring of Trinomials, **25.1** Special Cases of Factoring, **25.2** Factoring Polynomials, **25.3** Factor the Sum and Difference of Cubes, **25.4** Solving Quadratic Equations by Factoring, **25.5** Applications

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3181.1.3.8 Demonstrate fluency with techniques needed to simplify radical expressions and calculate with them, including addition, subtraction, and multiplication.	**SE: 31.2** Adding and Subtracting Radical Expressions, **31.3** Multiplying Radical Expressions, **31.4** Dividing Radical Expressions, **31.5** Rationalizing the Denominator, **31.6** Solving Radical Equations
3181.1.3.9 Rationalize denominators in order to perform division with radicals.	**SE: 31.5** Rationalizing the Denominator
3181.1.4 Graphic Mathematics	
3181.1.4.1 Understand that a linear function models a situation in which a quantity changes at a constant rate, *m*, relative to another.	**SE: 17.2** Graphing Linear Equations by Plotting Points, **17.3** Graphing Linear Equations Using Intercepts, **17.4** Graphing Linear Equations of the Form x=a, y=b, and y=mx, **17.5** Applications of Graphing Linear Equations, **18.1** The Slope of a Line, **18.2** Slope-Intercept Form, **18.3** Graphing Lines Using the Slope and y-Intercept, **18.4** Writing Equations of Lines Using a Point and Slope, **18.5** Writing Equations of Lines Using Two Points, **18.6** Writing Equations of Parallel and Perpendicular Lines, **19.5** Graphing Linear Functions
3181.1.4.2 Graph quadratic equations and identify key characteristics of the function.	**SE: 34.1** Introduction to Graphing Quadratic Functions, **34.2** Finding the Vertex of a Quadratic Function, **34.3** Finding the Intercepts of a Quadratic Function, **34.4** Graphing Quadratic Functions Summary, **34.5** Applications with Quadratic Functions
3181.1.4.3 Find the solution of a quadratic equation and/or zeros of a quadratic function.	**SE: 25.4** Solving Quadratic Equations by Factoring, **32.1** Introduction to Solving Quadratic Equations, **32.2** Solving Quadratic Equations by Factoring, **32.3** Solving Quadratic Equations using the Square Root Property, **32.4** Solving Quadratic Equations by Completing the Square, **32.5** Solving Quadratic Equations using the Quadratic Formula, **33.2** The Discriminant in the

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	Quadratic Formula, **33.3** Solving Quadratic Equations with Real or Complex Number Solutions, **33.4** Solving Equations Quadratic in Form, **33.5** Complex and Quadratic Applications, **34.1** Introduction to Graphing Quadratic Functions, **34.2** Finding the Vertex of a Quadratic Function, **34.3** Finding the Intercepts of a Quadratic Function, **34.4** Graphing Quadratic Functions Summary, **34.5** Applications with Quadratic Functions
3181.1.4.4 Operate (add, subtract, multiply, and divide) with and evaluate rational expressions.	**SE: 26.1** Introduction to Rational Expressions and Functions, **26.2** Simplifying Rational Expressions, **26.3** Multiplying Rational Expressions, **26.4** Dividing Rational Expressions, **27.1** Adding Like Rational Expressions, **27.2** Subtracting Like Rational Expressions, **27.3** Finding the Least Common Denominator for Rational Expressions, **27.4** Adding and Subtracting Unlike Rational Expressions, **28.1** Simplifying Complex Rational Expressions by Adding and Subtracting, **28.2** Simplifying Complex Rational Expressions by Multiplying by the LCD, **28.3** Solving Rational Equations, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT
3181.1.4.5 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.	**SE: 31.2** Adding and Subtracting Radical Expressions, **31.3** Multiplying Radical Expressions, **31.4** Dividing Radical Expressions, **31.5** Rationalizing the Denominator, **31.6** Solving Radical Equations
3181.1.4.6 Identify and calculate the measures of central tendency and spread in a set of data.	**SE: 13.4** Mean, **13.5** Median, **13.6** Mode
3181.1.4.7 Understand the correlation coefficient and its role in measuring the goodness of fit for a model for a data set.	**SE: E.4** The Correlation Coefficient and Data Analysis

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3181.1.4.8 Analyze data to make predictions based on an understanding of the data set, for example, use a scatter-plot to determine if a linear relationship exists and describe the association between the variables.	**SE: E.4** The Correlation Coefficient and Data Analysis
3181.1.4.9 Use algebra and geometry to solve problems involving midpoints and distances (i.e. geometric figures).	**SE: 30.5** More on The Pythagorean Theorem, **30.6** The Distance Formula
3181.1.5 Numeric Mathematics	
3181.1.5.1 Understand that there are numbers that are not rational numbers, called irrational numbers, e.g., *π, e,* and √2, which together with the rational numbers form the real number system that satisfies the laws of arithmetic.	**SE: 14.1** Introduction to Real Numbers, **14.7** Properties of Real Numbers, **31.1** Introduction to Radical Functions, **31.2** Adding and Subtracting Radical Expressions, **31.3** Multiplying Radical Expressions, **31.4** Dividing Radical Expressions, **31.5** Rationalizing the Denominator
3181.1.5.2 Apply and use elementary number concepts and number properties to model and solve nonroutine problems that involve new ideas.	**SE: 1.2** Rounding, **1.3** Adding Whole Numbers; Estimation, **1.5** Basic Problem Solving, **1.11** More Problem Solving, **2.6** Order of Operation and Integers, **5.1** Factors, **5.2** Prime Factorization, **5.4** Simplifying Fractions - GCF and Factors Method, **5.5** Simplifying Fractions - Prime Factors Method, **6.1** Finding the LCM - List Method, **6.2** Finding the LCM - GCF Method, **6.3** Finding the LCM - Prime Factor Method, **10.5** Percent and Decimal Conversions, **10.6** Percent and Fraction Conversions
3181.1.5.3 Determine if a data set represents a line through numerically analyzing slope calculations. If appropriate, interpret the slope in terms of a rate.	**SE: E.4** The Correlation Coefficient and Data Analysis
3181.1.5.4 Find the probability of simple events, disjoint events, compound events, and independent events in a variety of	**SE: 13.7** Introduction to Probability, **E.8** Probability: Counting Techniques, **E.9** Theoretical vs. Experimental Probability,

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settings using a variety of counting techniques.	**E.11** Geometric Probability
3181.1.5.5 Develop fluency with the basic operations of complex numbers.	**SE: 33.1** Complex Numbers, **33.2** The Discriminant in the Quadratic Formula, **33.3** Solving Quadratic Equations with Real or Complex Number Solutions, **33.4** Solving Equations Quadratic in Form, **33.5** Complex and Quadratic Applications
II. Making Connections Making connections allows those concepts that need a more complex look to be studied through two different modalities. This allows connections to be made between the concepts, and allows for a more in-depth understanding of the topics supporting the foundation for problem solving application. In addition, building topics in this manner helps students work problems of a higher depth of knowledge level.	
3181.2.1 Symbolic & Diagrammatic Mathematics	
3181.2.1.1 Use the laws of exponents to simplify and interpret expressions for exponential functions, recognizing positive rational exponents as indicating roots of the base and negative exponents as indicating the reciprocal of a power.	**SE: 21.4** Product Rule for Exponents, **21.5** Power Rule for Exponents, **3.1** The Quotient Rule, **23.2** Integer Exponents, **23.3** Scientific Notation, **30.4** Rational Exponents, **39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications
3181.2.1.2 Solve a linear inequality and provide an interpretation of the solution.	**SE: 18.7** Graphing Linear Inequalities in Two Variables, **35.2** Graphing Compound Inequalities, **35.3** Solving Compound Inequalities
3181.2.1.3 Recognize special products and factors of polynomials to facilitate problem solving with polynomials; in particular, find the zeros of a quadratic polynomial.	**SE: 24.1** Greatest Common Factor, **24.2** Factoring by Grouping, **24.3** Factoring Trinomials of the Form x^2+bx+c, **24.4** Factoring Trinomials of the Form ax^2+bx+c, **24.5** Factoring Trinomials by Grouping Numbers (the ac-Method), **24.6** More Factoring of Trinomials, **25.1** Special Cases of Factoring, **25.2** Factoring Polynomials, **25.3** Factor the Sum and Difference of Cubes, **25.4** Solving Quadratic Equations by Factoring, **25.5** Applications, **32.1** Introduction to

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	Solving Quadratic Equations, **32.2** Solving Quadratic Equations by Factoring, **32.3** Solving Quadratic Equations using the Square Root Property, **32.4** Solving Quadratic Equations by Completing the Square, **32.5** Solving Quadratic Equations using the Quadratic Formula, **32.6** Applications with Quadratic Equations
3181.2.1.4 Investigate the properties of plane figures, developing precise mathematical descriptions of geometric shapes, both in the plane and in space.	**SE: 11.1** Lines and Angles, **11.2** Figures, **11.3** Perimeter - Definitions and Units, **11.4** Finding Perimeter, **11.5** Area - Definitions and Units, **11.6** Finding Area, **11.7** Understanding Circles, **11.8** Finding Circumference, **11.9** Finding Area – Circles, **12.4** The Pythagorean Theorem, **12.5** Similar Figures, **12.6** Finding Missing Lengths, **12.7** Congruent Triangles, **12.8** Applications of Equations and Geometric Figures
3181.2.1.5 Apply a variety of strategies using relationships between perimeter, area, and volume to calculate desired measures in composite figures.	**SE: 11.3** Perimeter - Definitions and Units, **11.4** Finding Perimeter, **11.5** Area - Definitions and Units, **11.6** Finding Area, **11.7** Understanding Circles, **11.8** Finding Circumference, **11.9** Finding Area – Circles, **12.1** Volume - Definitions and Units, **12.2** Finding Volume
3181.2.2 Symbolic & Verbal Mathematics	
3181.2.2.1 Explain, solve, and/or draw conclusions for complex problems using relationships and elementary number concepts.	**SE: 1.2** Rounding, **1.3** Adding Whole Numbers; Estimation, **1.5** Basic Problem Solving, **1.11** More Problem Solving, **2.6** Order of Operation and Integers, **5.1** Factors, **5.2** Prime Factorization, **5.4** Simplifying Fractions - GCF and Factors Method, **5.5** Simplifying Fractions - Prime Factors Method, **6.1** Finding the LCM - List Method, **6.2** Finding the LCM - GCF Method, **6.3** Finding the LCM - Prime Factor Method, **10.5** Percent and Decimal Conversions,

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	10.6 Percent and Fraction Conversions
3181.2.2.2 Solve simple rational and radical equations in one variable, noting and explaining extraneous solutions.	**SE: 28.3** Solving Rational Equations, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT, **31.6** Solving Radical Equations
3181.2.2.3 Write ratios, proportions, and solve proportions in a contextual setting for an unknown value.	**SE: 10.1** Ratios, **10.2** Rates, **10.3** Proportions, **10.4** Percent Notation, **10.5** Percent and Decimal Conversions, **10.6** Percent and Fraction Conversions, **10.7** The Percent Equation, **10.8** The Percent Proportion, **10.9** Percent Applications
3181.2.2.4 Solve literal equations for any variable; interpret the results based on units.	**SE: 16.5** Solving Equations and Formulas for a Variable, **28.4** Applications of Rational Equations: Solving Formulas for a Variable
3181.2.3 Symbolic & Numeric Mathematics	
3181.2.3.1 In the context of exponential models, solve equations of the form	**SE: 39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications
$a \bullet b^{ct} = d$ where *a, c,* and *d* are specific numbers and the base *b* is 2, 10, or *e*.	**SE: 39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications
3181.2.3.2 Use the rules of exponents to develop an understanding of the difference between the rational and real numbers.	**SE: 23.2** Integer Exponents, **30.4** Rational Exponents, **38.3** Evaluating Exponential and Logarithmic Expressions
3181.2.3.3 Recognize functions as mappings of an independent variable into a dependent variable.	**SE: 19.1** Relations and Functions, **19.2** The Vertical Line Test, **19.3** Function Notation, **19.4** Evaluating Functions, **19.5** Graphing Linear Functions, **19.6** Applications of Functions

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3181.2.3.4 Evaluate polynomial and exponential functions that use function notation.	**SE: 34.1** Introduction to Graphing Quadratic Function, **34.2** Finding the Vertex of a Quadratic Function, **34.3** Finding the Intercepts of a Quadratic Function, **34.4** Graphing Quadratic Functions Summary, **34.5** Applications with Quadratic Functions, **38.4** Graphing Exponential Functions, **38.5** Converting Between Exponential and Logarithmic Forms
3181.2.3.5 Recognize composite functions as an application of substitution and use this understanding to write expressions for and evaluate composite functions.	**SE: 38.1** Composite Functions, **38.2** Inverse Functions
3181.2.4 Symbolic & Graphic Mathematics	
3181.2.4.1 Graphically represent the solution to a linear equation and the solution to a system of linear equations in two variables.	**SE: 17.2** Graphing Linear Equations by Plotting Points, **17.3** Graphing Linear Equations Using Intercepts, **17.4** Graphing Linear Equations of the Form x=a, y=b, and y=mx, **17.5** Applications of Graphing Linear Equations, **20.2** Solving by the Graphing Method, **36.1** Introduction to Absolute Value Equations, **36.2** Solving Basic Absolute Value Equations, **36.3** Solving Multiple Absolute Value Equations, **C.2** Systems of Non-Linear Equations, **C.4** Solving Systems of Linear Equations Using Matrices
3181.2.4.2 Graphically represent the solution to a linear inequality and the solution to a system of linear inequalities in two variables.	**SE: 16.6** Solving and Graphing Linear Inequalities in One Variable, **18.7** Graphing Linear Inequalities in Two Variables, **35.2** Graphing Compound Inequalities, **35.3** Solving Compound Inequalities, **35.4** Solving Quadratic Inequalities, **35.5** Solving Rational Inequalities, **36.4** Solving Absolute Value Inequalities, **C.1** Systems of Linear Inequalities
3181.2.4.3 Relate the basic definitions of the trigonometric ratios to the right triangle.	**SE: E.5** Right Triangle Trigonometry Ratios
3181.2.4.4 Identify the graphs of basic trigonometric functions and shifts of those	**SE: E.6** Graphs of Trigonometric Functions

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graphs.	
3181.2.4.5 Solve a simple system consisting of one linear equation and one quadratic equation in two variables; for example, find points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$. Illustrate the solution graphically.	**SE: C.2** Systems of Non-Linear Equations
3181.2.5 Numeric & Graphic Mathematics	
3181.2.5.1 Given a variety of appropriate information, determine the equation of a line.	**SE: 17.2** Graphing Linear Equations by Plotting Points, **17.3** Graphing Linear Equations Using Intercepts, **17.4** Graphing Linear Equations of the Form x=a, y=b, and y=mx, **17.5** Applications of Graphing Linear Equations, **18.1** The Slope of a Line, **18.2** Slope-Intercept Form, **18.3** Graphing Lines Using the Slope and y-Intercept, **18.4** Writing Equations of Lines Using a Point and Slope, **18.5** Writing Equations of Lines Using Two Points, **18.6** Writing Equations of Parallel and Perpendicular Lines
3181.2.5.2 Use appropriate technology to generate the equation of a line from a set of data and if appropriate, use it to make a prediction.	**SE: E.4** The Correlation Coefficient and Data Analysis
3181.2.5.3 Use appropriate technology to find the mathematical model for a set of non-linear data.	**SE: E.4** The Correlation Coefficient and Data Analysis
3181.2.5.4 Compare measures of central tendency and spread for a single data set along with its graph and summary statistics.	**SE: 13.4** Mean, **13.5** Median, **13.6** Mode, **E.4** The Correlation Coefficient and Data Analysis

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3181.2.5.5 Compare data sets using graphs and summary statistics, and measures of central tendency and spread.	**SE: 13.4** Mean, **13.5** Median, **13.6** Mode, **E.4** The Correlation Coefficient and Data Analysis
3181.2.5.6 Examine radical and rational equations, both graphically and numerically, to determine restrictions on the domain of the variables.	**SE: 26.1** Introduction to Rational Expressions and Functions, **31.1** Introduction to Radical Functions
3181.2.5.7 Apply special right-triangle properties and the Pythagorean Theorem to solve congruent, similar shape, and contextual problems.	**SE: 12.4** The Pythagorean Theorem, **30.5** More on The Pythagorean Theorem, **E.5** Right Triangle Trigonometry Ratios
3181.2.6 Numeric & Diagrammatic Mathematics	
3181.2.6.1 Understand and use basic counting techniques in contextual settings.	**SE: 13.7** Introduction to Probability, **E.8** Probability: Counting Techniques, **E.9** Theoretical vs. Experimental Probability, **E.11** Geometric Probability
3181.2.6.2 Use counting techniques to calculate probabilities for conditional and independent events.	**SE: E.8** Probability: Counting Techniques, **E.9** Theoretical vs. Experimental Probability
3181.2.6.3 Compare a theoretical probability model to an experimental probability model for the same process.	**SE: E.8** Probability: Counting Techniques, **E.9** Theoretical vs. Experimental Probability, **E.11** Geometric Probability
III. Applications: Ways of Looking at the World Students are confronted with different ways to look at the world. Here students look at multiple representations of concepts, blend their new understanding of topics with applications, and have the opportunity to model contextual situations. Various applications should be addressed each week, throughout the course to support theoretical learning and increased complexity.	
3181.3.1 Applications with Numbers	
3181.3.1.1 Solve problems using scientific notation.	**SE: 23.3** Scientific Notation
3181.3.1.2 Solve problems involving percent of increase or decrease, for example mark-ups and mark-downs.	**SE: 10.7** The Percent Equation, **10.9** Percent Applications
3181.3.1.3 Solve rate, distance, and work problems using proportions and percentages.	**SE: 10.7** The Percent Equation, **10.8** The Percent Proportion, **10.9** Percent Applications,

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	28.3 Solving Rational Equations, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT, **29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation
3181.3.1.4 Solve problems involving evaluation of exponential functions, for example applications involving simple and compound interest.	**SE: 38.4** Graphing Exponential Functions, **39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications
3181.3.2 Applications with Geometry	
3181.3.2.1 Solve problems involving ratios in geometric settings, such as similar figures and right triangle distance problems.	**SE: E.3** Triangle Side-Splitter Theorem, **E.5** Right Triangle Trigonometry Ratios
3181.3.2.2 Solve problems involving finding missing dimensions given area or perimeter of the figure.	**SE: 11.3** Perimeter - Definitions and Units, **11.4** Finding Perimeter, **11.5** Area - Definitions and Units, **11.6** Finding Area
3181.3.2.3 Solve problems involving surface areas and volumes of 3-dimensional figures, including maximization, scale, and increment problems.	**SE: 12.1** Volume - Definitions and Units, **12.2** Finding Volume, **D.3** Surface Area
3181.3.2.4 Solve problems involving angles of elevation and angles of declination.	**SE: E.7** Angles of Elevation/Declination
3181.3.2.5 Solve problems requiring the interpretation of polynomial, rational, and exponential graphs that depict real-world phenomena, including identification of max/min and end behavior of functions.	**SE: 26.1** Introduction to Rational Expressions and Functions, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **31.1** Introduction to Radical Functions, **34.1** Introduction to Graphing Quadratic Functions, **34.2** Finding the Vertex of a Quadratic Function, **34.3** Finding the Intercepts of a Quadratic Function, **34.4** Graphing Quadratic Functions Summary, **34.5** Applications with Quadratic

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	Functions, **38.4** Graphing Exponential Functions
3181.3.3 Applications with Functions	
3181.3.3.1 Solve problems involving applications of linear equations.	**SE: 15.4** Linear Equations and Solutions, **15.5** Using the Addition and Multiplication Properties, **15.6** Using the Addition and Multiplication Properties Together, **20.6** Applications of Systems of Linear Equations
3181.3.3.2 Solve problems involving direct and inverse variations, such as frequency, interest, and pressure.	**SE: 29.1** Direct Variation, **29.2** Inverse Variation, **29.3** Joint and Combined Variation, **29.4** Applications of Variation
3181.3.3.3 Solve problems involving systems of equations such as mixture problems.	**SE: 20.1** Introduction to Systems of Linear Equations, **20.2** Solving by the Graphing Method, **20.3** Solving by the Substitution Method, **20.4** Solving by the Elimination Method, **20.5** Solving a System in Three Variables by the Elimination Method, **20.6** Applications of Systems of Linear Equations
3181.3.3.4 Solve problems involving quadratic equations such as area and gravity; additionally examine the fact that quadratic functions have maximum or minimum values and can be used to model problems with optimum solutions.	**SE: 25.4** Solving Quadratic Equations by Factoring, **25.5** Applications, **32.1** Introduction to Solving Quadratic Equations, **32.2** Solving Quadratic Equations by Factoring, **32.3** Solving Quadratic Equations using the Square Root Property, **32.4** Solving Quadratic Equations by Completing the Square, **32.5** Solving Quadratic Equations using the Quadratic Formula, **32.6** Applications with Quadratic Equations, **33.2** The Discriminant in the Quadratic Formula, **33.3** Solving Quadratic Equations with Real or Complex Number Solutions, **33.4** Solving Equations Quadratic in Form, **33.5** Complex and Quadratic Applications
3181.3.3.5 Solve problems involving radical equations, such as wind chill and body mass index.	**SE: 31.6** Solving Radical Equations

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3181.3.3.6 Solve problems involving rational equations such as work problems.	**SE: 28.3** Solving Rational Equations, **28.4** Applications of Rational Equations: Solving Formulas for a Variable, **28.5** Applications of Rational Equations: Work Problems, **28.6** Applications of Rational Equations: D = RT
3181.3.3.7 Solve problems involving exponential applications such as half-life and continuous interest.	**SE: 38.3** Evaluating Exponential and Logarithmic Expressions, **38.4** Graphing Exponential Functions, **38.5** Converting Between Exponential and Logarithmic Forms, **39.4** Solving Simple Exponential Equations and Applications, **39.5** Solving Exponential Equations and Applications
3181.3.4 Applications with Data	
3181.3.4.1 Solve problems involving constructing and interpreting pie charts.	**SE: 3.3** Circle Graphs
3181.3.4.2 Solve problems that use the construction and interpretation of Venn diagrams to analyze the attributes of a set of data, for example logic and counting problems.	**SE: E.10** Venn Diagrams
3181.3.4.3 Solve problems involving geometric probabilities.	**SE: E.11** Geometric Probability