## MyReadinessTest ${ }^{\circledR}$ for English \& Mathematics

## Math Content Library - Topics \& Objectives

## Module 1: $\quad$ Whole Numbers

1 Reading and Writing Whole Numbers
1 Identify the place value of digits in whole numbers.
2 Write whole numbers in words.
3 Write whole numbers using digits.
4 Solve word problems involving whole numbers.
2 Comparing and Rounding Whole Numbers
1 Compare whole numbers.
2 Round whole numbers to the given place value.
3 Solve word problems involving rounding whole numbers.
3 Adding and Subtracting Whole Numbers
1 Add whole numbers when carrying is not required.
2 Add whole numbers when carrying is required.
3 Subtract whole numbers when borrowing is not required.
4 Subtract whole numbers when borrowing is required.
5 Solve word problems involving the addition of whole numbers.
6 Solve word problems involving the subtraction of whole numbers.
4 Multiplying Whole Numbers
1 Multiply single-digit whole numbers.
2 Use multiplication shortcuts for numbers ending in zero.
3 Multiply by whole numbers having more than one digit.
4 Solve word problems involving the multiplication of whole numbers.
5 Dividing Whole Numbers
1 Identify dividends, divisors, quotients, and remainders.
2 Write division problems using other symbols.
3 Perform short division.
4 Given a division problem, select an appropriate answer.
5 Perform long division.
6 Solve word problems involving the division of whole numbers.
6 Estimate by Rounding
1 Estimate answers by rounding.
2 Estimate by rounding, then find exact answers.
3 Solve word problems involving estimation.
7 Exponents and Roots
1 Identify exponents and bases.
2 Expand and evaluate whole numbers raised to positive exponents.
3 Find square roots of perfect squares.
8 The Order of Operations
1 Use the order of operations.
2 Solve word problems involving the order of operations.

Factors of Whole Numbers
1 Find factors of numbers.
2 Determine if a number is prime, composite, or neither.
3 Find prime factorizations.
4 Identify the greatest common factor (GCF).
5 Solve word problems involving factors.

## Module 2: Fractions and Mixed Numbers

1 Basics of Fractions
1 Identify numerators and denominators.
2 Identify proper fractions and improper fractions.
3 Use fractions to represent diagrams or word problems.
4 Analyze part/whole relationships.
5 Locate fractions on the number line.
2 Basics of Mixed Numbers
1 Identify proper fractions, improper fractions, and mixed numbers.
2 Locate mixed numbers on the number line.
3 Convert mixed numbers to improper fractions.
4 Convert improper fractions to mixed numbers.
3 Writing a Fraction in Lowest Terms
1 Test divisibility.
2 Write a fraction in lowest terms using common factors or the GCF.
3 Write a fraction in lowest terms using prime factorization.
4 Solve word problems involving writing a fraction in lowest terms.
4 Equivalent Fractions
1 Determine whether two fractions are equivalent.
2 Rewrite fractions with the indicated numerator or denominator.
5 Multiplying Fractions
1 Multiply with fractions.
2 Multiply mixed numbers.
3 Solve word problems involving the multiplication of fractions.
4 Solve word problems involving the multiplication of mixed numbers.
6 Dividing Fractions
1 Find the reciprocal of a fraction.
2 Divide fractions.
3 Divide mixed numbers.
4 Solve word problems involving the division of fractions.
5 Solve word problems involving the division of mixed numbers.
7 Adding and Subtracting Like Fractions
1 Determine if fractions are like fractions or unlike fractions.
2 Add like fractions.
3 Subtract like fractions.
4 Solve word problems involving the addition and subtraction of like fractions.
8 Least Common Multiples and Least Common Denominator
1 Find the least common multiple (LCM) using prime factorization.
2 Find the least common multiple (LCM) using multiples of the largest number.
3 Find the least common denominator (LCD) of a list of fractions.
4 Write fractions with the least common denominator (LCD).
5 Identify the greater of two fractions.
6 Solve word problems involving the LCM or LCD.
9 Adding and Subtracting Unlike Fractions
1 Add or subtract unlike fractions.
2 Add or subtract mixed numbers.
3 Solve word problems involving adding or subtracting unlike fractions.
10 Exponents and Roots
1 Evaluate fractions raised to positive exponents.
2 Find square roots of fractions with perfect square numerators and denominators.
3 Solve word problems involving exponents or roots of fractions.
11 The Order of Operations and Complex Fractions
1 Use the order of operations.
2 Understand the difference between regular fractions and complex fractions.
3 Simplify complex fractions.
4 Solve word problems involving the order of operations.

## Module 3: Decimals

1 Reading and Writing Decimals
1 Identify the place value of digits in decimal numbers.
2 Write decimal numbers given place values.
3 Write decimal numbers as fractions or mixed numbers.
4 Write decimal numbers in words and vice versa.
5 Solve word problems involving writing decimals.
2 Comparing and Rounding Decimals
1 Arrange decimals in order.
2 Round decimals to a given place value.
3 Round monetary values.
4 Solve word problems involving rounding decimals.
3 Adding and Subtracting Decimals
1 Add or subtract decimals.
2 Add or subtract decimals with rounding.
3 Use estimation skills.
4 Solve word problems involving the addition or subtraction of decimals.
5 Solve word problems involving estimation.
4 Multiplying Decimals
1 Multiply decimals.
2 Multiply decimals by powers of ten.
3 Multiply decimals with rounding.
4 Evaluate decimals raised to positive exponents.
5 Solve word problems involving the multiplication of decimals.
5 Dividing Decimals
1 Divide decimals by whole numbers.
2 Divide decimals by decimals.
3 Divide decimals by powers of ten.
4 Divide decimals with rounding.
5 Solve word problems involving the division of decimals.

Writing Fractions and Decimals
1 Write fractions as equivalent decimals.
2 Write decimals as equivalent fractions.
3 Arrange decimals and fractions in order.
4 Solve word problems involving fractions and decimals.

## Module 4: Introduction to Algebra and the Real Number System

1 Introduction to Integers, Opposites, and Absolute Value
1 Represent real-life situations with integers.
2 Graph integers on a number line.
3 Define absolute value.
4 Find opposites and absolute values of numbers.
5 Simplify absolute value expressions.
6 Solve word problems involving absolute value.
Adding Integers
1 Add integers.
2 Evaluate whether statements are true or false.
3 Write a numerical expression for a phrase and simplify it.
4 Solve word problems involving addition with integers.
3 Subtracting Integers
1 Subtract integers.
2 Write a numerical expression for a phrase and simplify it.
3 Solve word problems involving subtraction with integers.
4 Multiplying and Dividing Integers
1 Multiply integers.
2 Divide integers.
3 Evaluate algebraic expressions using integers.
4 Solve word problems involving multiplication and division with integers.
5 Introduction to Expressions
1 Review the order of operations.
2 Identify coefficients, constants, and variables in an expression.
3 Evaluate algebraic expressions.
4 Rewrite phrases as algebraic expressions.
6 Introduction to Inequalities
1 Use inequality symbols.
2 Reverse inequality symbols.
3 Solve word problems involving inequalities.
7 Introduction to Equations
1 Decide whether a given number is a solution to an equation.
2 Write sentences as equations.
3 Understand the difference between expressions and equations.
4 Solve modeling word problems.
8 Real Numbers and the Number Line
1 Classify numbers.
2 Graph numbers on a number line.
3 Order numbers using inequality symbols.
4 Compare irrational and rational numbers.
9 Calculating with Real Numbers
1 Add or subtract signed numbers.
2 Multiply or divide real numbers.
3 Simplify expressions using the order of operations.
4 Determine whether numerical statements are true or false.
5 Write numerical statements involving real numbers and simplify.
6 Translate sentences to equations.
7 Solve word problems involving calculations of real numbers.
10 Properties of Real Numbers
1 Identify properties of real numbers.
2 Write an equivalent expression using the given property.
3 Simplify expressions using properties of real numbers.
4 Rewrite expressions using the distributive property.
11 Simplifying Expressions
1 Understand the difference between terms and factors.
2 Identify terms as like or unlike.
3 Combine like terms.
4 Simplify expressions.

## Module 5: Ratio, Proportion, and Percent

1 Ratios
1 Write ratios using different notation.
2 Write ratios as fractions and simplify.
3 Solve word problems involving ratios.
2 Rates
1 Understand the different between ratios and rates.
2 Write rates as fractions.
3 Find unit rates.
4 Determine the best buy.
5 Solve word problems involving rates.
3 Proportions
1 Write proportions.
2 Write ratios in lowest terms to determine whether proportions are true or false.
3 Use cross products to determine whether proportions are true or false.
4 Find the unknown number in a proportion.
5 Solve word problems involving proportions.
4 Basics of Percent: Decimals
1 Write percents as decimals.
2 Write decimals as percents.
3 Convert between decimals and percents.
4 Solve word problems involving percent.
5 Basics of Percent: Fractions
1 Write percents as fractions or mixed numbers.
2 Write fractions as percents.
3 Convert between fractions, decimals, and percents.
4 Solve word problems involving percent.
6 Understanding and Using the Percent Proportion
1 Set up percent proportions.
2 Set up percent proportions for word problems.
3 Find the part using the percent proportion.
4 Find the whole using the percent proportion.
5 Find the percent using the percent proportion.
6 Solve word problems using the percent proportion.
7 Using the Percent Equation
1 Find the part using the percent equation.
2 Find the whole using the percent equation.
3 Find the percent using the percent equation.

4 Solve word problems using the percent equation.
8 Solving Word Problems with Percent
1 Solve word problems involving percent.
2 Solve word problems involving percent increase or percent decrease.
3 Solve word problems involving sales tax and total price.
4 Solve word problems involving commissions.
5 Solve word problems involving discounts and sale prices.
9 Simple Interest
1 Find simple interest.
2 Find total amount due.
3 Solve word problems involving simple interest.

## Module 6: Measurement and Significant Digits

1 U.S. Customary Units
1 Learn units for time.
2 Learn U.S. customary units for length.
3 Learn U.S. customary units for capacity and weight.
4 Convert measurements by multiplying or dividing.
5 Convert measurements using unit fractions.
6 Solve word problems involving U.S. customary units.
2 The Metric System: Length
1 Learn the basic metric units of length.
2 Determine the correct unit.
3 Convert among metric units.
4 Solve word problems involving metric units of length.
3 The Metric System: Capacity and Mass
1 Learn the basic metric units of capacity and mass.
2 Determine the correct unit.
3 Determine if a dosage is reasonable or unreasonable.
4 Convert among metric units.
5 Solve word problems involving metric units of capacity and mass.
4 Metric and U.S. Customary Conversion
1 Use unit fractions to convert from metric units to U.S. customary units.
2 Use unit fractions to convert from U.S. customary units to metric units.
3 Use unit fractions to convert the units used in rates.
4 Solve word problems involving unit conversions.
5 Temperature
1 Learn common temperatures on the Celsius scale.
2 Convert temperatures from degrees Celsius to degrees Fahrenheit.
3 Convert temperatures from degrees Fahrenheit to degrees Celsius.
4 Solve word problems involving temperature.
6 Significant Digits
1 Determine the significant digits of a number.
2 Understand the difference between precision and accuracy.
3 Solve word problems involving significant digits.

## Module 7: Linear Equations and Inequalities; Absolute Value

1 Review of Expressions
1 Simplify expressions.
2 Translate phrases into expressions.
3 Translate sentences into equations. 6 of 23

2 Solving Linear Equations in One Variable
1 Solve linear equations using the addition and multiplication properties of equality.
2 Solve linear equations containing parentheses.
3 Solve linear equations containing fractions.
4 Solve word problems involving solving linear equations in one variable.
3 More on Solving Linear Equations in One Variable Understand the difference between equations resulting in one solution, infinitely many
1 solutions, or no solution.
2 Solve linear equations resulting in infinitely many solutions.
3 Solve linear equations resulting in no solution.
4 Solve linear equations resulting in one solution, infinitely many solutions, or no solution.
5 Solve word problems involving solving linear equations in one variable.
4 Formulas
1 Solve formulas for specified variables.
2 Use formulas to solve problems.
5 Solving Linear Inequalities
1 Decide whether a given number is a solution to an inequality.
2 Understand the difference between set builder notation and interval notation.
3 Graph inequalities on a number line.
4 Use the addition property of inequality.
5 Use the multiplication property of inequality.
6 Use the addition property and multiplication property of inequality.
7 Write solutions of linear inequalities using different notation.
8 Solve word problems involving linear inequalities.
6 Set Operations and Compound Inequalities
1 Find and graph the intersection or union of two sets.
2 Solve compound inequalities with the word and.
3 Solve three-part inequalities.
4 Solve compound inequalities with the word or.
5 Solve word problems involving compound inequalities.
7 Absolute Value Equations and Inequalities
1 Solve absolute value equations.
2 Solve absolute value inequalities.
3 Solve equations with absolute value expressions on both sides.
4 Solve special cases of absolute value equations and inequalities.
5 Solve word problems involving absolute value equations and inequalities.

## Module 8: Introduction to Graphing

1 The Rectangular Coordinate System
1 Identify x-coordinates and y-coordinates in ordered pairs.
2 Identify the quadrant or axis where a given point lies.
3 Read the coordinates of a point on a graph.
4 Plot points.
2 Graphing Linear Equations
1 Determine whether ordered pairs are solutions of linear equations.
2 Complete ordered-pair solutions of equations and plot these points.
3 Match linear graphs with their equations.
4 Graph linear equations by plotting points.
5 Solve word problems involving graphing linear equations.
3 The Distance and Midpoint Formulas
1 Find the distance between two points.
2 Find the midpoint of a line segment.
3 Solve word problems involving the distance formula.
4 Solve word problems involving the midpoint formula.
Intercepts
1 Find $x$ - and $y$-intercepts.
2 Graph linear equations by plotting $x$ - and $y$-intercepts.
3 Identify horizontal and vertical lines.
4 Graph horizontal and vertical lines.
5 Solve word problems involving intercepts.

## 5 The Slope of a Line

1 Find slope given two points on a line.
2 Identify slopes and y-intercepts of lines given their equations in slope-intercept form.
3 Find slopes and y-intercepts of lines given their equations in any form.
4 Determine whether the slopes of lines are positive, negative, zero, or undefined.
5 Solve word problems involving slope.
6 Parallel and Perpendicular Lines
1 Determine whether lines are parallel, perpendicular, or neither. Use slope-intercept form to determine whether two lines are parallel, perpendicular, or neither.
7 Equations of Lines
1 Write an equation of a line given its slope and y-intercept.
2 Write an equation of a line given its slope and a point on the line.
3 Write an equation of a line given two points on the line.
4 Write an equation of a line given its graph.
5 Solve word problems involving the equations of lines.
8 Graphing Linear Equations Using Slope
1 Graph a line given its slope and a point on the line.
2 Graph a line given its equation in slope-intercept form.
3 Graph a line given its equation in any form.
4 Solve word problems involving graphing linear equations.
9 Graphing Linear Inequalities in Two Variables
1 Determine whether ordered pairs are solutions of linear inequalities in two variables.
2 Graph linear inequalities in two variables.
3 Solve word problems involving graphing linear inequalities.

## Module 9: Geometry: Part I

1 Lines and Angles
1 Name lines, line segments, rays, and angles using different notations.
2 Classify angles.
3 Identify and calculate measures of complementary and supplementary angles.
4 Identify and calculate measures of congruent angles.
5 Identify and calculate measures of angles using properties of parallel lines.

## 2 Plane Figures

1 Identify different types of triangles.
2 Use the sum of the angles in a triangle to find unknown angle measures.
3 Identify different types of quadrilaterals.
4 Use properties of quadrilaterals to find unknown angle measures.
5 Recognize other polygons, including regular polygons.
3 Perimeter and Area

1 Find the perimeter of triangles.
2 Find the perimeter of quadrilaterals or other polygons.
3 Find the perimeter of composite figures.
4 Find the area of triangles.
5 Find the area of rectangles and squares.
6 Find the area of parallelograms and trapezoids.
7 Find the area of composite figures.
8 Solve perimeter or area word problems.
4 Circles
1 Find the radius and diameter of a circle.
2 Find the circumference and area of a circle.
3 Solve word problems involving circles.
5 Working with Perimeter, Circumference, and Area
1 Find the missing dimension of a figure given its perimeter, circumference, or area.
2 Find the perimeter or circumference of a figure given its area.
3 Find the area of a figure given its perimeter or circumference.
4 Solve word problems involving perimeter, circumference, or area.
6 Space Figures
1 Understand the difference between plane figures and space figures.
2 Identify vertices, edges, and faces.
3 Identify different types of solids (space figures).
7 Surface Area
1 Find the surface area of a prism or cylinder.
2 Find the surface area of a pyramid or cone.
3 Find the surface area of a sphere.
4 Find the surface area of composite figures.
5 Solve word problems involving surface area.
8 Volume
1 Find the volume of a prism or cylinder.
2 Find the volume of a pyramid or cone.
3 Find the volume of a sphere.
4 Find the volume of composite figures.
5 Solve word problems involving volume
9 Working With Surface Area and Volume
1 Find the missing dimension of a figure given its surface area or volume.
2 Find the surface area of a figure given its volume.
3 Find the volume of a figure given its surface area.
4 Solve word problems involving surface area or volume.

## Module 10: Geometry: Part II

1 The Pythagorean Theorem
1 Review square roots.
2 Use the Pythagorean Theorem to find the hypotenuse.
3 Use the Pythagorean Theorem to find unknown side lengths.
4 Determine if lists of numbers are Pythagorean triples.
5 Solve word problems involving the Pythagorean Theorem.
2 Congruent and Similar Figures
1 Understand the difference between similarity and congruency.
2 Use properties of congruence to find measures of angles and sides.
3 Use proportions to find measures of unknown sides in similar figures.
4 Solve word problems involving congruent and similar figures.

3 Congruent and Similar Triangles
1 Use angle and side relationships to prove congruency.
2 Use properties of congruence to find measures of angles and sides.
3 Use proportions to find measures of unknown sides in similar triangles.
4 Solve word problems involving congruent and similar triangles.
4 Translations
1 Identify isometries.
2 Transform figures using translations.
3 Solve word problems involving translations.
5 Reflections
Reflect a point across a line.
Transform figures using reflections.
Solve word problems involving reflections.
6 Rotations
Transform figures using rotations.
Identify rotation images of figures.
Find the angle of rotation.
Solve word problems involving rotations.
7 Symmetry
Identify types of symmetry in plane figures.
Identify types of symmetry in space figures.
Solve word problems involving symmetry.
8 Dilations
1 Find scale factors in dilations.
2 Transform figures using dilation.
3 Use scale factors to find lengths.
4 Solve word problems involving dilations.
9 Compositions of Reflections
1 Transform figures using compositions of reflections.
2 Transform figures using glide reflections.
3 Classify isometries.
4 Solve word problems involving compositions of reflections.

## Module 11: Data and Statistics

1 Types of Data
1 Understand the difference between quantitative and qualitative variables.
2 Understand the difference between statistics and parameters.
3 Understand the difference between discrete and continuous values.
4 Understand the difference between sample and population.
5 Determine if a sample is representative of a population.
2 Sample Data
1 Understand the difference between surveys, observational studies, and experiments.
2 Identify the type of observational study.
3 Identify the type of sampling method used.
4 Understand why randomness is necessary.
5 Determine bias in samples and surveys.
6 Understand the difference between random samples and simple random samples.
7 Understand the difference between sample error and measurement error.
Analyze samples.
Plan a study.
3 Tables and Pictographs
1 Interpret information from a table.

2 Interpret information from a pictograph.
4 Circle Graphs and Scatterplots
1 Interpret circle graphs.
2 Construct circle graphs.
3 Interpret scatterplots.
4 Construct scatterplots.
5 Bar Graphs and Line Graphs
1 Interpret bar graphs.
2 Construct bar graphs.
3 Interpret line graphs.
4 Construct line graphs.
5 Translate between pictographs, circle graphs, bar graphs, and line graphs.
6 Frequency Distributions, Histograms, and Stem-and-Leaf Displays
1 Interpret histograms.
Complete frequency tables.
Construct histograms.
Interpret stem-and-leaf displays.
Create stem-and-leaf displays.
7 Mean and Weighted Mean
1 Understand the difference between mean and weighted mean.
2 Find the mean.
3 Find the weighted mean.
4 Find the missing data value of a list of numbers given the mean.
5 Solve word problems involving mean and weighted mean.
8 Median and Mode
1 Understand the difference between mean, median, and mode.
2 Find the median.
3 Find the mode.
4 Solve word problems involving median and mode.
9 Box-and-Whisker Plots and the 5-Number Summary
1 Understand the difference between center and spread.
2 Understand the difference between range and interquartile range.
3 Complete 5-Number summaries.
4 Create box-and-whisker plots.
10 Variance and Standard Deviation
1 Understand the difference between variance and standard deviation.
2 Calculate variance and standard deviation.

## Module 12: Introduction to Functions

1 Introduction to Functions
1 Understand definitions of relations and functions.
2 Understand the difference between dependent variables and independent variables.
3 Find the domain and range of a relation and determine whether it is a function.
4 Understand the difference between discrete functions and continuous functions.
5 Use the vertical line test to identify functions.
6 Use the horizontal line test to identify one-to-one functions.
2 Linear Functions
1 Decide whether an equation defines a function.
2 Evaluate linear functions.
3 Find the domain and range of a linear function.
4 Write linear functions.
5 Solve word problems involving linear functions.
3 Absolute Value Functions

1 Evaluate absolute value functions.
2 Find the domain of absolute value functions.
3 Find the intercepts of absolute value functions.
4 Graphing Absolute Value Functions or Inequalities
1 Graph absolute value functions.
2 Identify the domain, range, and intercepts of an absolute value function from its graph. Identify intervals on which absolute value functions are increasing, decreasing, or
3 constant.
4 Use graphs to locate relative maxima or minima for absolute value functions. Determine whether ordered pairs are solutions of absolute value inequalities in two
5 variables.
6 Graph absolute value inequalities in two variables.

## Module 13: Exponents and

 Polynomials1 Introduction to Polynomials
1 Identify polynomials.
2 Identify terms of a polynomial.
3 Determine the coefficient and degree of each term.
4 Combine like terms.
5 Classify polynomials as monomials, binomials, or trinomials.
6 Find the degree of a polynomial.
7 Write polynomials in descending order.
8 Evaluate polynomials and polynomial functions.
2 Adding and Subtracting Polynomials
1 Add polynomials.
2 Subtract polynomials.
3 Add or subtract polynomial functions.
4 Solve perimeter word problems involving the addition or subtraction of polynomials.
5 Solve word problems involving the addition or subtraction of polynomials.
3 The Product Rule and Power Rules for Exponents
1 Identify exponents and bases.
2 Write repeated factors using exponential notation.
3 Evaluate an exponential expression.
4 Use the product rule for exponents.
5 Use the power rule for exponents.
6 Use the power of a product rule for exponents.
7 Use more than one rule for exponents.
8 Solve word problems involving the product rule and power rules for exponents.
4 Multiplying a Monomial and a Polynomial
1 Multiply a monomial and a polynomial using the rectangular method.
2 Multiply a monomial and a polynomial using the distributive property.
3 Solve word problems involving multiplying a monomial and a polynomial.
5 Multiplying Binomials
1 Multiply two binomials using the rectangular method.
2 Multiply two binomials using the distributive property.
3 Multiply two binomials using the FOIL method.
4 Identify the mistakes in finding the product.
5 Solve area word problems involving multiplying binomials.
6 Multiplying Polynomials
1 Multiply two polynomials.

2 Multiply polynomial functions.
3 Identify the mistakes in finding the product.
4 Solve geometry word problems involving multiplying polynomials.
7 Special Products
1 Square binomials.
2 Find the product of a sum and difference of two terms.
3 Find higher powers of binomials.
4 Solve geometry word problems involving special products.
8 Integer Exponents and the Quotient Rule
1 Simplify expressions with a zero exponent.
2 Understand the negative exponent rule.
3 Simplify expressions containing negative exponents.
4 Use the quotient rule for exponents.
5 Use more than one rule for exponents.
6 Solve word problems involving the quotient rule of exponents.
9 Dividing a Polynomial by a Monomial
1 Divide a polynomial by a monomial.
2 Solve geometry word problems involving the division of a polynomial by a monomial.
3 Solve word problems involving the division of a polynomial by a monomial.
10 Dividing a Polynomial by a Polynomial
1 Divide using long division of polynomials.
2 Divide using synthetic division.
3 Identify the mistakes in finding the quotient.
4 Solve geometry word problems involving the division of polynomials.
5 Solve word problems involving the division of polynomials.
11 Scientific Notation
1 Express numbers in scientific notation.
2 Convert from scientific notation to decimal form.
3 Perform calculations using scientific notation.
4 Solve word problems involving scientific notation.

## Module 14: Factoring Polynomials

1 Factoring the Greatest Common Factor
1 Review finding the greatest common factor of a list of numbers.
2 Find the greatest common factor of a list of terms.
3 Factor out the greatest common factor.
4 Factor by grouping.
2 Factoring Trinomials of the Form $x^{\wedge} 2+b x+c$
1 Factor trinomials of the form $x^{\wedge} 2+b x+c$, where $b>0$ and $c>0$.
2 Factor trinomials of the form $x^{\wedge} 2+b x+c$, where $b<0$ and $c>0$.
3 Factor trinomials of the form $x^{\wedge} 2+b x+c$, where $c<0$.
4 Factor out the greatest common factor and then factor trinomials of the form
$x^{\wedge} 2+b x+c$.
3 Factoring Trinomials of the Form $a x^{\wedge} 2+b x+c$
1 Factor trinomials of the form $a x^{\wedge} 2+b x+c$, where $a c$ is positive.
2 Factor trinomials of the form $a x^{\wedge} 2+b x+c$, where $a c$ is negative.
3 Factor out the greatest common factor and then factor trinomials of the form $a x^{\wedge} 2+b x+c$.
4 Factor by grouping.
5 Factor by substitution.
4 Factoring Special Cases
1 Factor perfect square trinomials.
2 Factor a difference of two squares.

3 Factor the sum or difference of two cubes.
4 Identify the mistake in factoring a polynomial.
5 Solving Quadratic Equations by Factoring
1 Solve quadratic equations by factoring.
2 Solve higher-degree polynomial equations by factoring.
3 Solve geometry word problems involving quadratic equations.
4 Solve word problems involving consecutive integers.
5 Solve word problems involving quadratic models.

## Module 15: Rational Expressions and Functions

1 The Fundamental Property of Rational Expressions
1 Evaluate rational expressions
Identify values for which a rational expression is undefined.
Write rational expressions in lowest terms.
Recognize equivalent forms of rational expressions.
Solve word problems involving rational expressions.
2 Multiplying and Dividing Rational Expressions
1 Multiply rational expressions.
2 Find reciprocals.
3 Divide rational expressions.
4 Solve word problems involving the multiplication or division of rational expressions.
3 Adding and Subtracting Rational Expressions
1 Add or subtract rational expressions having the same denominator.
2 Find the least common denominator for a group of rational expressions.
3 Rewrite rational expressions with given denominators.
4 Add or subtract rational expressions having different denominators.
5 Solve word problems involving the addition or subtraction of rational expressions.
4 Simplify Complex Fractions
1 Use the method of first simplifying the numerator and denominator separately. Use the method of first multiplying the numerator and denominator by the LCD of all the
2 fractions in the complex fraction.
5 Solving Rational Equations
1 Evaluate rational functions.
2 Solve rational equations.
3 Solve rational equations with variables in denominators.
4 Solve formulas for specified variables.
6 Rational Functions
1 Find the domain and range of rational functions.
2 Solve word problems involving unknown numbers.
3 Solve word problems involving distance, rate, and time.
4 Solve word problems about work.
7 Graphing Rational Functions
1 Graph rational functions.
2 Identify intervals on which rational functions are increasing, decreasing, or constant.
3 Analyze graphs of rational functions.
4 Solve word problems involving graphing rational functions.
8 Variation
1 Understand the difference between direct and inverse variation.
2 Solve problems about direct variation.
3 Solve problems about inverse variation.
4 Solve word problems involving direct and inverse variation.

## Module 16: Systems and Matrices

## 1 Systems of Linear Equations by Graphing

1 Decide whether an ordered pair is a solution to a system of linear equations.
2 Solve linear systems by graphing.
3 Describe systems of linear equations.
4 Solve word problems by graphing systems of linear equations.
2 Systems of Linear Equations by Substitution
1 Solve linear systems using the substitution method.
2 Solve word problems involving systems of linear equations.
3 Systems of Linear Equations by Elimination
1 Solve linear systems using the elimination method when multiplication is not necessary.
2 Solve linear systems using the elimination method when multiplication is necessary.
3 Solve word problems involving systems of linear equations.
4 Systems of Linear Equations by Any Method
1 Solve linear systems using any method.
2 Solve word problems involving mixtures.
3 Solve word problems involving unknown numbers.
4 Solve word problems involving prices or investments.
5 Solve word problems involving wind or currents.
5 Systems of Linear Inequalities
Understand the difference between the solution sets of systems of linear equations
and
1 systems of linear inequalities.
2 Decide whether an ordered pair is a solution to a system of linear inequalities.
3 Graph systems of linear inequalities.
4 Solve word problems involving systems of linear inequalities.
6 Systems of Linear Equations in Three Variables
1 Solve systems of three equations.
2 Solve word problems involving systems of three variables.
7 Solving Systems of Linear Equations by Matrix Methods
1 Use row operations to solve a system with two variables.
2 Use row operations to solve a system with three variables.
8 Properties of Matrices
1 Know the basic definitions for matrices.
2 Add and subtract matrices.
3 Multiply a matrix by a scalar.
4 Multiply matrices.
5 Solve word problems using matrices.
9 Matrix Inverses
1 Find multiplicative inverse matrices.
2 Use inverse matrices to solve systems of linear equations.
3 Solve modeling applications.
10 Determinants and Cramer's Rule
1 Evaluate $2 \times 2$ determinants.
2 Use expansion by minors to evaluate $3 \times 3$ determinants.
3 Apply Cramer's rule to solve linear systems.

## Module 17: Roots and Radicals

1 Introduction to Roots and Radicals
1 Review finding square roots of perfect squares.
2 Understand the difference between principal square roots and their opposites.
3 Identify indices and radicands of radical expressions.
4 Identify cases where radical expressions are undefined.
5 Approximate irrational square roots.
6 Find higher roots.
7 Use rational exponents to simplify radical expressions.
8 Find squares of radical expressions.
9 Solve word problems involving roots and radical expressions.
2 Product and Quotient Rules for Radicals
1 Use the product rule for radicals to multiply radical expressions.
2 Use the product rule for radicals to simplify radical expressions.
3 Use the quotient rule for radicals to simplify radical expressions.
4 Use the product rule and quotient rule for radicals to simplify radical expressions.
3 Adding and Subtracting Radicals
1 Understand the difference between like and unlike radicals.
2 Add or subtract like radicals.
3 Simplify radical expressions, then add or subtract any like radicals.
4 Solve word problems involving the addition or subtraction of like radicals.
4 Rationalizing the Denominator
1 Rationalize denominators with square roots.
2 Rationalize denominators with cube roots.
3 Use conjugates to rationalize denominators of radical expressions.
5 More Simplifying and Operations with Radicals
1 Simplify expressions containing radicals.
2 Write radical expressions with quotients in lowest terms.
6 Solving Equations Containing Radicals
1 Solve radical equations with one radical term.
2 Solve radical equations with two isolated radical terms.
3 Solve radical equations with two radical terms.
4 Identify extraneous solutions.
5 Solve word problems involving solving radical equations.
7 Square Root and Cube Root Functions
1 Evaluate square root and cube root functions.
2 Identify the domain and range for square root and cube root functions.
3 Find the intercepts of square root and cube root functions.
4 Solve word problems involving square root and cube root functions.
8 Graphing Square Root and Cube Root Functions
1 Graph square root and cube root functions.
Identify intervals on which square root and cube root functions are increasing,
2 decreasing, or constant.
Identify the domain, range, and intercepts of square root and cube root functions given
3 their graphs.

## Module 18: Quadratic Equations and Inequalities; Complex Numbers

1 Using the Square Root Property to Solve Quadratic Equations
1 Solve equations of the form $x^{\wedge} 2=k$.
2 Solve equations of the form $(a x+b)^{\wedge} 2=k$.
3 Use formulas involving squared variables.
4 Solve word problems using the square root property.
2 Completing the Square to Solve Quadratic Equations
1 Complete the square.
2 Solve by completing the square when the coefficient of the squared term is one.
3 Solve by completing the square when the coefficient of the squared term is not one.

4 Simplify before solving.
5 Solve word problems by completing the square.
3 Using the Quadratic Formula to Solve Quadratic Equations
1 Identify the values of $a, b$, and $c$ for quadratic equations.
2 Use the quadratic formula to solve equations.
3 Use the discriminant to determine the number of real solutions.
4 Approximate solutions from the quadratic formula using a calculator.
5 Solve word problems using the quadratic formula.
4 Quadratic Inequalities
1 Graph quadratic inequalities.
2 Solve quadratic inequalities using any method.
3 Graph solution sets of quadratic inequalities on number lines.
4 Solve word problems involving quadratic inequalities.
5 Introduction to Complex Numbers
1 Identify the real and imaginary parts of a complex number.
2 Write complex numbers using inotation.
3 Plot complex numbers and find their absolute value.
4 Add and subtract complex numbers.
6 Using Complex Numbers
1 Multiply complex numbers.
2 Find complex conjugates.
3 Divide complex numbers.
4 Perform operations with square roots of negative numbers.
5 Solve word problems involving complex numbers.
7 Solving Quadratic Equations with Complex Solutions
1 Solve quadratic equations by the square root property.
2 Solve quadratic equations by completing the square.
3 Write quadratic equations given complex roots.
8 Using the Quadratic Formula (with Complex Solutions)
1 Solve quadratic equations using the quadratic formula.
2 Use the discriminant to determine the number and types of solutions.
3 Determine the most efficient method to use when solving a quadratic equation. 4 Solve word problems modeled by quadratic equations.
9 Quadratic Functions
1 Evaluate quadratic functions.
2 Convert between $f(x)=a x^{\wedge} 2+b x+c$ and standard form $f(x)=a(x-h)^{\wedge} 2+k$.
3 Recognize characteristics of parabolas from functions written in vertex form.
4 Write an equation for a parabola given its graph.
5 Solve word problems involving quadratic functions.
Graphs of Quadratic Functions
1 Graph a parabola given its equation in vertex form.
2 Graph a parabola using its roots.
3 Identify the domain, range, and intercepts of a quadratic function from its graph.
4 Use graphs to locate maxima or minima values.
5 Solve word problems involving graphs of quadratic functions.
11 Systems of Quadratic Equations and Inequalities
1 Solve linear-quadratic systems by graphing.
2 Solve linear-quadratic systems by substitution.
3 Solve systems of quadratic equations by any method.
4 Solve systems of quadratic inequalities by graphing.
5 Solve word problems involving systems of quadratic equations or inequalities.

Piecewise Functions
1 Understand piecewise function notation.
2 Evaluate piecewise functions.
3 Graph piecewise functions.
4 Solve word problems involving piecewise functions.
2 Even and Odd Functions
1 Understand the difference between even and odd functions.
2 Identify functions as even or odd.
3 Identify the types of symmetry for a function.
4 Solve word problems involving even and odd functions.
3 Transformations of Functions: Vertical and Horizontal Shifts
1 Use vertical shifts to graph functions.
2 Use horizontal shifts to graph functions.
3 Graph functions involving a sequence of transformations.
4 Transformations of Functions: Reflections
1 Use reflections about the x-axis to graph functions.
2 Use reflections about the $y$-axis to graph functions.
3 Graph functions involving a sequence of transformations.
5 Transformations of Functions: Stretching and Shrinking
1 Use vertical stretching to graph functions.
2 Use vertical shrinking to graph functions.
3 Use horizontal stretching to graph functions.
4 Use horizontal shrinking to graph functions.
5 Graph functions involving a sequence of transformations.
6 Combinations of Functions
1 Review finding the domain of a function.
2 Combine functions using the algebra of functions, specifying domains.
3 Evaluate combined functions.
4 Solve word problems involving the combination of functions.
7 Composite Functions
1 Form composite functions.
2 Evaluate composite functions.
3 Determine domains for composite functions.
4 Write functions as compositions.
5 Solve word problems involving composite functions.
8 Inverse Functions
1 Verify inverse functions.
2 Find the inverse of a function.
3 Use the horizontal line test to determine if a function has an inverse function.
4 Use the graph of a one-to-one function to graph its inverse function.
5 Find the inverse of a function and graph both functions on the same axes.

## Module 20: Exponential and Logarithmic Functions

1 Exponential Functions
1 Identify exponential functions.
2 Evaluate exponential functions.
3 Find the domain and range of exponential functions.
4 Evaluate functions with base e.
5 Solve word problems involving exponential functions.
2 Graphs of Exponential Functions
1 Graph exponential functions.
2 Identify the domain, range, and intercepts of a exponential function from its graph.

3 Identify intervals on which exponential functions are increasing, decreasing, or constant.

4 Natural Logarithms
1 Understand when to use natural logarithms.
2 Convert between exponential form and logarithmic form.
3 Evaluate natural logarithmic functions.
4 Solve word problems involving natural logarithms.
5 Graphs of Logarithmic Functions
1 Graph logarithmic functions.
2 Identify the domain, range, and intercepts of a logarithmic function from its graph.
3 Identify intervals on which logarithmic functions are increasing, decreasing, or constant.
4 Solve word problems involving graphing logarithmic functions.
6 Properties of Logarithms
1 Use properties of logarithms to simplify expressions.
2 Use properties of logarithms to expand expressions.
3 Use properties of logarithms to evaluate expressions.
4 Use the change of base formula.
5 Solve word problems involving properties of logarithms.
7 Solving Exponential Equations
1 Solve exponential equations with a common base.
2 Solve exponential equations using logarithms.
3 Solve exponential equations by graphing.
4 Solve word problems involving exponential equations.
8 Solving Logarithmic Equations
1 Solve logarithmic equations using exponents.
2 Solve logarithmic equations using properties of logarithms.
3 Solve logarithmic equations by graphing.
4 Solve word problems involving logarithmic equations.
9 Exponential Growth and Decay
1 Model exponential growth.
2 Model exponential decay.
3 Solve word problems involving exponential growth.
4 Solve word problems involving exponential decay.
10 Compound Interest
1 Find compound interest and the compounding amount.
2 Find the time or rate needed to produce a given amount of compound interest.
3 Solve word problems involving compound interest.

## Module 21: Sequences and Series

1 Infinite Sequences
1 Identify the mathematical patterns found in a sequence.
2 Find particular terms of a sequence from the general term.
3 Use recursion formulas.
4 Solve word problems involving infinite sequences.
2 Factorials and Summation Notation
1 Use factorial notation.

2 Use summation notation.
3 Solve word problems involving summation notation.
3 Arithmetic Sequences
1 Find the common difference of an arithmetic sequence.
2 Find terms of an arithmetic sequence.
3 Use the formula for the general term of an arithmetic sequence.
4 Calculate the arithmetic mean.
5 Solve word problems involving arithmetic sequences.
4 Geometric Sequences
1 Find the common ratio of a geometric sequence.
2 Find terms of a geometric sequence.
3 Use the formula for the general term of a geometric sequence.
4 Identify a sequence as arithmetic, geometric, or neither.
5 Calculate the geometric mean.
6 Solve word problems involving geometric sequences.
5 Arithmetic Series
1 Use the formula for the sum of the first n terms of an arithmetic sequence.
2 Write an arithmetic series in summation notation.
3 Identify finite and infinite sequences and series.
4 Solve word problems involving arithmetic series.
6 Geometric Series
1 Use the formula for the sum of the first n terms of a geometric sequence.
2 Determine whether an infinite geometric series converges or diverges.
3 Use the formula for the sum of an infinite geometric series.
4 Identify a series as arithmetic, geometric, or neither.
5 Solve word problems involving geometric series.

## Module 22: Counting, Probability, and Distributions

1 The Binomial Theorem
1 Find binomial coefficients.
2 Expand binomials using the binomial theorem.
3 Find the nth term of a binomial expansion.
4 Use Pascal's triangle to expand a binomial.
5 Solve word problems involving the binomial theorem.
2 Permutations and Combinations
1 Apply the fundamental counting principal.
2 Count permutations.
3 Count combinations.
4 Understand the difference between permutations and combinations.
3 Introduction to Probability
1 Understand the differences between outcomes, sample spaces, and events.
2 Use a tree diagram to count outcomes.
3 Use Venn diagrams to count outcomes.
4 Find theoretical probabilities.
4 Empirical Probability
1 Understand the difference between theoretical probability and empirical probability.
2 Find empirical probabilities.
3 Find the complement of the probability of an event.
4 Calculate odds.
5 Probability of Independent Events and Dependent Events
1 Understand the difference between independent events and dependent events.
2 Find probabilities of independent events.

3 Find probabilities of dependent events.
6 Probability of Mutually Exclusive Events and Overlapping Events
1 Understand the difference between mutually exclusive events and overlapping events.
2 Find probabilities of mutually exclusive events.
3 Find probabilities of overlapping events.
7 Conditional Probability
1 Find conditional probabilities.
2 Use tables and tree diagrams to determine conditional probabilities.
8 Binomial Distributions
1 Find probabilities using the binomial probability formula.
2 Expand binomials using the binomial theorem with combinations.
3 Use binomial expansion to find binomial distributions.
4 Solve word problems involving binomial distributions.
9 Normal Distributions
Understand the difference between discrete probability distributions and continuous
1 probability distributions.
2 Review standard deviations.
3 Identify graphs that are positively skewed, negatively skewed, or normally distributed.
4 Sketch normal curves.
5 Solve word problems involving normal distributions.

## Module 23: Trigonometric

## Functions

1 Introduction to Angles
1 Review different types of angles.
2 Convert between decimal degrees and degrees-minutes-seconds.
3 Draw angles in standard position and identify the quadrant where the terminal side lies.

4 Solve word problems involving angles.
2 Angles and Radian Measure
1 Use radian measure.
2 Convert between degrees and radians.
3 Review complementary and supplementary angles.
4 Find coterminal angles.
5 Solve word problems involving angles.
3 Arcs
1 Find the length of a circular arc.
2 Calculate linear speed.
3 Calculate angular speed.
4 Solve word problems involving arc length.
5 Solve word problems involving linear speed and angular speed.
4 Right Triangle Trigonometry
1 Use right triangles to evaluate trigonometric functions.
2 Evaluate trigonometric functions of special angles.
3 Understand and use reciprocal identities.
4 Evaluate trigonometric functions with a calculator.
5 Solve word problems involving right triangle trigonometry.
5 Trigonometric Functions of Any Angle
1 Use the definitions of trigonometric functions of any angle.
2 Use the signs of the trigonometric functions.
3 Find reference angles.
4 Use reference angles to evaluate trigonometric functions.

Trigonometric Functions of Real Numbers; Periodic Functions
1 Use a unit circle to define trigonometric functions of real numbers.
2 Use even and odd trigonometric functions.
3 Use periodic properties.
4 Solve word problems.
7 Fundamental Trigonometric Identities
1 Understand and use quotient identities.
2 Understand and use Pythagorean identities.
3 Use fundamental trigonometric identities to simplify expressions.
8 Graphs of the Sine and Cosine Functions
1 Graph sine functions.
2 Identify the period and amplitude of sine functions.
3 Graph cosine functions.
4 Identify the period and amplitude of cosine functions.
5 Solve word problems involving modeling periodic behavior.
9 Graphs of the Tangent and Cotangent
Functions
1 Graph tangent functions.
2 Identify the period and asymptotes of tangent functions.
3 Graph cotangent functions.
4 Identify the period and asymptotes of cotangent functions.
10 Graphs of the Cosecant and Secant Functions
1 Graph cosecant functions.
2 Identify the period and asymptotes of cosecant functions.
3 Graph secant functions.
4 Identify the period and asymptotes of secant functions.
5 Match graphs of trigonometric functions with their equations.
11 Inverse Trigonometric Functions
1 Find exact values for the inverse sine function.
2 Find exact values for the inverse cosine function.
3 Find exact values for the inverse tangent function.
4 Use a calculator to evaluate inverse trigonometric functions.
5 Find exact values of composite functions with inverse trigonometric functions.

## Module 24: Additional Trigonometry Topics

## 1 Verifying Trigonometric Identities

1 Verify identities.
2 Sum and Difference Formulas
1 Use the formula for the cosine of the difference of two angles.
2 Use sum and difference formulas for cosines and sines.
3 Use sum and difference formulas for tangents.
3 Double-Angle, Power-Reducing, and Half-Angle Formulas
1 Use the double-angle formulas.
2 Use the power-reducing formulas.
3 Use the half-angle formulas.
4 Product-to-Sum and Sum-to-Product Formulas
1 Use the product-to-sum formulas.
2 Use the sum-to-product formulas.
5 Trigonometric Equations
1 Find all solutions of a trigonometric equation.
2 Solve equations with multiple angles.
3 Solve trigonometric equations quadratic in form.
4 Use factoring to separate different functions in trigonometric equations.

5 Use identities to solve trigonometric equations.
6 Solve applications.
6 The Laws of Sines and Cosines
1 Solve triangles using the Law of Sines.
2 Solve triangles using the Law of Cosines.
3 Find areas of triangles.
4 Solve applications.
7 Vectors
1 Perform vector operations geometrically and algebraically.
2 Find the magnitude and direction angle of a vector.
3 Find the magnitudes of horizontal and vertical components of a vector.
4 Write the given position vector.
5 Find the magnitude of a resultant force.
$6 \quad$ Write a vector in the form $a i+b j$.

## Module 25: Conic Sections and Analytic

Geometry
1 Circles
1 Write the standard form of an equation of a circle.
2. Give the center and radius of a circle whose equation is in standard form and graph the circle.
3. Convert the general form of the equation of a circle into standard form and graph the circle.
4. Find and use points of intersection between graphs of circles and lines.
5. Solve applications.

2 The Ellipse
1 Graph ellipses centered at the origin and locate the foci.
2 Write the equation of an ellipse in standard form from its graph.
3 Write the equation of an ellipse in standard form from given conditions.
4 Graph ellipses not centered at the origin and locate the foci.
5 Convert the general form of an ellipse to standard form by completing the square.
6 Solve a system of equations by graphing.
7 Solve applications.
3 The Hyperbola
1 Graph hyperbolas centered at the origin and determine the vertices and foci.
2 Write the equation of a hyperbola in standard form from given conditions.
3 Write the equation of a hyperbola in standard form from its graph.
4 Graph hyperbolas not centered at the origin and determine the vertices and foci.
5 Convert the general form of a hyperbola to standard form by completing the square.
6 Graph relations and determine the domain and range.
7 Solve a system of equations by graphing.
8 Solve applications.
4 Parabola
1 Graph parabolas with vertices at the origin.
2 Write equations of parabolas in standard form.
3 Graph parabolas with vertices not at the origin.
4 Determine the domain and range of a relation.
5 Solve a system of equations by graphing.
6 Solve applications.
5 Systems of Nonlinear Equations in Two Variables
1 Solve systems of nonlinear equations by substitution.
2 Solve systems of nonlinear equations by addition.
3 Solve systems of nonlinear equations by the method of your choice.
Solve problems using systems of nonlinear equations.
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6 Rotation of Axes
1 Identify conics without completing the square.
2 Use rotation of axes formulas.
3 Write equations of rotated conics in standard form.
4 Identify conics without rotating axes.
5 Use a graphing utility to graph the equation of a rotated conic section.
7 Parametric Equations
1 Find coordinates of points on a plane curve for given values of the parameter.
2 Use point plotting to graph plane curves described by parametric equations.
3 Eliminate the parameter.
4 Find parametric equations for functions.
5 Graph plane curves represented by parametric functions.
6 Solve applications.
8 Conic Sections in Polar Coordinates
1 Define conics in terms of a focus and a directrix.
2 Graph the polar equations of conics.
3 Solve applications.

