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Trigonometry with Corequisite Support: A Targeted Review | Table of Contents

        - Find the secant, cosecant, tangent, and cotangent values for angles in the first quadrant of the unit circle
        - Use reference angles to evaluate secant, cosecant, tangent, and cotangent functions
        - Evaluate trigonometric functions with a calculator
    - Use Given Trigonometric Ratios to Find Other Ratios
        - Understand the relationship between the quadrant in which an angle falls and the signs of the trig functions of that angle
        - Use the Pythagorean identity
        - Find the values of all trigonometric functions given coordinates on a unit circle
        - Find the values of all trigonometric functions given the value of one trigonometric function

Chapter 3: Periodic Functions

3.1 Sine and Cosine Graphs

- Characteristics of Sine and Cosine Graphs
    - Graph the sine function and understand its properties
    - Graph the cosine function and understand its properties
- Transformations of Sine and Cosine Graphs
    - Determine the period and amplitude of a sinusoidal function
    - Determine the phase shift and vertical shift of a sinusoidal function
- Graph Sine and Cosine Functions
    - Find the equation of a sinusoidal function given a graph
    - Find the graph of a sinusoidal function given equation
    - Use sinusoidal functions to solve real-world applications

3.2 Graphs of Other Trigonometric Functions

- Characteristics of Tangent and Cotangent Graphs
    - Graph tangent functions
    - Graph cotangent functions
- Transformations of Tangent and Cotangent Functions
    - Graph tangent or cotangent functions over different periods
    - Graph transformations of tangent and cotangent functions
- Characteristics of Secant and Cosecant Graphs
    - Graph cosecant functions
    - Graph secant functions
- Transformations of Secant and Cosecant Functions
    - Graph transformations of cosecant functions
    - Graph transformations of secant functions
    - Find the equation of a cosecant function from a graph
    - Find the equation of a secant function from a graph

3.3 Inverse Trigonometric Functions

- Introduction to Inverse Trigonometric Functions
    - Understand inverse sine, cosine, and tangent functions
    - Understand inverse secant, cosecant, and cotangent functions
    - Use a calculator to evaluate inverse trigonometric functions
- Solve Triangles with Inverse Trigonometric Functions

        - Find an angle given two sides of a right triangle
        - Solve right triangle problems
    - Compose Functions with Inverse Trigonometric Functions
        - Evaluate composite functions with inverse trigonometric functions in the form f(f-1(x)) or f(g-1(x))
        - Evaluate composite functions with inverse trigonometric functions in the form f-1(f(x)) or f-1(g(x))

Chapter 4: Trigonometric Identities and Equations

4.1 Fundamental Trigonometric Identities

- Simplify Expressions with Basic Trigonometric Identities
    - Understand quotient and reciprocal identities
    - Use even and odd identities in simplifying trigonometric expressions
- Use Pythagorean and Cofunction Identities
    - Understand all forms of the pythagorean identity
    - Use the cofunction identities
- Verify Trigonometric Identities
    - Use all identities to simplify trigonometric expressions
    - Use algebraic techniques to simplify trigonometric expressions

4.2 Sum and Difference Identities

- Sum and Difference Formulas
    - Use the sum and difference formula for cosine
    - Use the sum and difference formula for sine
    - Use the sum and difference formula for tangent
    - Use the sum and difference formulas to simplify trigonometric expressions

4.3 Double-Angle, Half-Angle, and Reduction Formulas

- Double-Angle Formulas
    - Use double-angle formulas to find values of trigonometric functions
    - Use double-angle formulas to simplify trigonometric expressions
- Half-Angle and Power-Reduction Formulas
    - Use reduction formulas to simplify an expression
    - Use half-angle formulas to find values of trigonometric functions

4.4 Sum-to-Product and Product-to-Sum Formulas

- Sum-to-Product and Product-to-Sum Formulas
    - Express the product of trigonometric functions as a sum
    - Express sums of trigonometric functions as a product

4.5 Trigonometric Equations

- Trigonometric Equations in Sine and Cosine
    - Solve linear trigonometric equations in sine
    - Solve linear trigonometric equations in cosine
- Trigonometric Equations Involving a Single Trigonometric Function
    - Solve linear trigonometric equations in secant and cosecant
    - Solve linear trigonometric equations in tangent and cotangent
    - Solve trigonometric equations using a calculator
- Trigonometric Equations in Quadratic Form or Requiring Factoring

        - Solve equations with a single trigonometric function
        - Solve factorable trigonometric equations in quadratic form
        - Solve trigonometric equations in quadratic form requiring the quadratic formula
    - Trigonometric Equations Requiring Identities or Multiple Angles
        - Solve trigonometric equations using fundamental identities
        - Solve trigonometric equations with multiple angles
        - Solve trigonometric equations using cofunction identities

Chapter 5: Further Applications of Trigonometry

5.1 Non-right Triangles - Law of Sines
- Law of Sines
    - Use the law of sines to solve ASA or AAS triangles
    - Use the law of sines to solve SSA triangles
    - Solve applied problems with the law of sines

5.2 Non-right Triangles - Law of Cosines and Area of Oblique Triangles
- Law of Cosines
    - Use the law of cosines to solve SAS triangles
    - Use the law of cosines to solve SSS triangles
    - Solve applied problems with the law of cosines
- Area of Oblique Triangles
    - Find the area of an oblique triangle using the sine function
    - Use Heron's formula to find the area of a triangle

5.3 Polar Coordinates
- Convert Coordinates Between Rectangular and Polar Forms
    - Plot points using polar coordinates
    - Convert from polar coordinates to rectangular coordinates
    - Convert from rectangular coordinates to polar coordinates
- Convert Equations Between Rectangular and Polar Forms
    - Write a cartesian equation in polar form
    - Write a polar equation in cartesian form

5.4 Graphs in Polar Coordinates
- Introduction to Graphing Polar Equations
    - Test a polar equation for symmetry
    - Find zeros and maximum values for a polar equation and graph polar equations by plotting points
    - Graph a circle or a line from a polar equation
- Graph Classic Polar Curves
    - Graph a cardioid from a polar equation
    - Graph a limacon from a polar equation
    - Graph a lemniscate from a polar equation
    - Graph a rose curve from a polar equation

5.5 Polar Form of Complex Numbers
- Write Complex Numbers in Polar Form
    - Plot complex numbers
    - Find the absolute value of a complex number

        - Write complex numbers in polar form
        - Convert a complex number from polar to rectangular form
    - Product and Quotient of Complex Numbers in Polar Form
        - Find the product of complex numbers in polar form
        - Find the quotient of complex numbers in polar form
    - Powers and Roots of Complex Numbers in Polar Form
        - Find powers of complex numbers in polar form
        - Find roots of complex numbers in polar form

5.6 Parametric Equations

- Write Parametric Equations
    - Parameterize a curve
    - Find the parametric equations for a line segment given an orientation
- Eliminate the Parameter
    - Eliminate the parameter in linear equations
    - Eliminate the parameter in polynomial and radical equations
    - Eliminate the parameter in exponential and logarithmic equations
    - Eliminate the parameter in trigonometric parametric equations

5.7 Graphs with Parametric Equations

- Graph Parametric Equations
    - Graph parametric equations by plotting points
    - Graph trigonometric parametric equations by plotting points
    - Use parametric equations in applications

5.8 Vectors

- Properties of Vectors
    - Understand properties of vectors and find the position vector
    - Find magnitude and direction of a vector
- Vector Addition and Scalar Multiplication
    - Add or subtract vectors
    - Multiply a vector by a scalar
    - Use vector addition and scalar multiplication to find a new vector
- The Unit Vector
    - Write a vector in terms of i and j
    - Find the unit vector
    - Perform operations on vectors in terms of i and j
    - Write a vector in terms of magnitude and direction
- The Dot Product and Vector Applications
    - Find the dot product of two vectors
    - Find the angle between two vectors
    - Use vectors in applications

Corequisite Support: A Targeted Review

Chapter 1: Foundations

1.1 Use the Language of Algebra

- Prime Factorizations, Algebraic Symbols, and Order of Operations
  - Find factors, prime factorizations, and least common multiples
  - Use algebraic symbols and variables
  - Simplify expressions with grouping symbols and exponents using order of operations
- Simplifying and Rewriting Algebraic Expressions
  - Evaluate an expression involving exponents and order of operations
  - Identify and combine like terms
  - Translate an English phrase and word problems into an algebraic expression

1.2 Integers

- Absolute Value and Operations on Integers
  - Understand absolute value and simplify expressions involving absolute value with order of operations
  - Add and subtract integers
  - Multiply and divide integers
- Algebraic Expressions with Integers
  - Simplify expressions with integers
  - Evaluate variable expressions with integers
  - Translate an English phrase and word problems involving integers into an algebraic expression

1.3 Fractions

- Operations on Fractions
  - Simplify fractions
  - Multiply and divide fractions
  - Add and subtract fractions
- Algebraic Expressions with Fractions
  - Evaluate variable expressions involving fractions
  - Use the order of operations to simplify fractions

1.4 Decimals

- Operations on Decimals and Understanding Percents
  - Name and round decimals
  - Evaluate expressions by adding and subtracting decimals
  - Multiply and divide decimals
  - Convert between decimals, fractions, and percents
- Square Roots and the Real Number System
  - Evaluate square roots - IA
  - Identify integers, rational numbers, irrational numbers, and real numbers
  - Locate fractions and decimals on the number line

1.5 Properties of Real Numbers

- Using the Properties of Real Numbers
  - Understand and use the commutative and associative properties
  - Use the properties of identity, inverse, and zero
  - Simplify an expression using the distributive property

Chapter 2: Solving Linear Equations

2.1 Use a General Strategy to Solve Linear Equations

- Solving Linear Equations in One Variable
  - Determine if a value is the solution to an equation
  - Use a general strategy to solve a linear equation
  - Determine if an equation is a contradiction, identity, or conditional equation
- Solving Linear Equations with Fraction and Decimal Coefficients
  - Solve an equation with fractional coefficients
  - Solve an equation with decimal coefficients

2.2 Use a Problem Solving Strategy

- An Introduction to Problem Solving
  - Develop a problem-solving strategy for word problems
  - Solve number word problems
- Literal Equations and Using Formulas with Geometry
  - Solve a formula for a specified variable
  - Use a formula to solve a geometric application
  - Use the Pythagorean theorem - IA

2.3 Solve Linear Inequalities

- Solving Linear Inequalities
  - Graph an inequality on a number line and use interval notation
  - Solve a linear inequality that requires only one step
  - Solve a linear inequality that requires multiple steps to solve
  - Translate words to an inequality and solve applications with linear inequalities

2.4 Solve Compound Inequalities

- Solving Compound Inequalities
  - Solve a compound inequality involving intersections
  - Solve a compound inequality involving unions
  - Solve applications with compound inequalities

2.5 Solve Absolute Value Inequalities

- Solving Absolute Value Equations and Inequalities
  - Solve an absolute value equation
  - Solve an absolute value inequality involving "less than"
  - Solve an absolute value inequality involving "greater than"
  - Solve applications with absolute value

Chapter 3: Graphs and Functions

3.1 Graph Linear Equations in Two Variables

- The Rectangular Coordinate System and Graphing Linear Equations
  - Plot points on the rectangular coordinate system and identify the quadrants of points
  - Understand the relationship between solutions to an equation and points on a graph
  - Graph linear equations by plotting points
  - Graph horizontal and vertical lines
- Graphing Linear Equations with Intercepts
  - Find the intercepts of a line from a graph or an equation
  - Graph a line using intercepts

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3.2 Slope of a Line

- The Slope of a Line
  - Find the slope of a line using the relationship between rise and run
  - Find the slope of a line given two points on the line
- Graphing Linear Equations with Slope
  - Graph a line given the slope and a point
  - Identify the slope and intercept of a line from its equation and use it to graph the line
  - Graph a linear equation using a variety of methods
- Applications of Slope and Parallel and Perpendicular Lines
  - Interpret applications using graphs and slope
  - Determine if two lines are parallel or perpendicular by comparing slopes

3.3 Find the Equation of a Line

- Equations of Lines
  - Find the equation of a line given the y-intercept and the slope
  - Find the equation of a line given a point on the line and the slope
  - Find the equation of a line given two points on the line
- Equations of Parallel and Perpendicular Lines
  - Find the equation of a line parallel to a given line
  - Find the equation of a line perpendicular to a given line

3.4 Graph Linear Inequalities in Two Variables

- Graphing Linear Inequalities
  - Verify that a given point is a solution to an inequality in two variables
  - Write a linear inequality given its graph
  - Graph a linear inequality in two variables
  - Solve applications using linear inequalities in two variables

3.5 Relations and Functions

- Introduction to Functions
  - Find the domain and range of a relation
  - Determine if a relation is a function given a set of ordered pairs or a mapping
  - Determine if a relation is a function given an equation
- Function Notation
  - Use function notation to find the value of a function given a number
  - Use function notation to find the value of a function given a variable expression

3.6 Function Graphs and Transformations

- The Vertical Line Test and Graphs of Functions
  - Use the vertical line test to determine if a graph represents a function
  - Identify graphs of basic functions
  - Read information from the graph of a function
- Transformations of Functions
  - Graph functions using vertical and horizontal shifts
  - Graph functions using reflections about the x-axis and the y-axis
  - Graph functions using compressions and stretches
  - Combine transformations

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Chapter 4: Systems of Linear Equations

4.1 Solve Systems of Linear Equations with Two Variables

- Solving Systems of Linear Equations in Two Variables by Graphing
  - Determine if an ordered pair is a solution of a system of linear equations
  - Solve systems of linear equations by graphing
  - Identify inconsistent and dependent systems of equations with two variables
- Solving Systems of Linear Equations in Two Variables Algebraically
  - Solve a system of linear equations using the substitution method
  - Solve a system of linear equations using the elimination method
  - Choose the most convenient method to solve a system of linear equations

4.2 Solve Applications with Systems of Equations

- Systems of Linear Equations in Two Variables and Problem Solving
  - Solve applications of uniform motion using systems of equations
  - Solve geometric application problems using systems of equations
  - Solve word problems and applications using a system of linear equations

4.3 Graphing Systems of Linear Inequalities

- Solving Systems of Linear Inequalities
  - Determine if an ordered pair is a solution of a system of linear inequalities
  - Solve systems of linear inequalities by graphing
  - Solve an application using systems of linear inequalities

Chapter 5: Polynomials and Polynomial Functions

5.1 Add and Subtract Polynomials

- Adding and Subtracting Polynomials and Polynomial Functions
  - Determine the degree and type of a given polynomial and write it in standard form
  - Add or subtract polynomial expressions
  - Evaluate a polynomial function for a given value
  - Add or subtract polynomial functions

5.2 Properties of Exponents and Scientific Notation

- Simplifying Expressions with Properties of Exponents and Negative Exponents
  - Use the product property of exponents to simplify expressions
  - Use the quotient property and the zero property of exponents to simplify expressions
  - Rewrite expressions with positive exponents using the definition of negative exponents
  - Use the power property for exponents and extensions to products and quotients to simplify expressions
  - Simplify exponential expressions by combining all properties
- Scientific Notation
  - Convert between decimal notation and scientific notation
  - Multiply and divide expressions given in scientific notation

5.3 Multiplying Polynomials

- Multiplying Polynomials
  - Multiply monomials and multiply a polynomial by a monomial
  - Multiply two binomials

    - Multiply a polynomial by a polynomial
- Special Products of Binomials and Multiplying Polynomial Functions
    - Use the binomial squares pattern to square a binomial
    - Use the conjugate pairs pattern to multiply conjugates
    - Multiply polynomial functions

5.4 Greatest Common Factor and Factor by Grouping

- The Greatest Common Factor and Factoring by Grouping
    - Find the greatest common factor of monomial expressions
    - Factor the greatest common factor from polynomial expressions
    - Factor polynomials by grouping

5.5 Factor Trinomials

- Factoring Trinomials
    - Factor a trinomial with a leading coefficient of 1
    - Factor a trinomial with a leading coefficient of greater than 1 using trial and error
    - Factor a trinomial with a leading coefficient of greater than 1 using the 'ac' method
    - Factor a trinomial in a quadratic form using substitution

5.6 Factor Special Products

- Factoring Special Products
    - Factor polynomials using a perfect squares binomial pattern
    - Factor polynomials using a difference of squares pattern
    - Factor a sum or a difference of cubes
    - Factor polynomials by combining the difference of squares and perfect square trinomial patterns

5.7 General Strategy for Factoring Polynomials

- Choosing a Factoring Strategy
    - Use a general strategy for factoring polynomials

5.8 Polynomial Equations

- Solving Polynomial Equations by Factoring
    - Use the zero product property to solve a factored polynomial equation
    - Solve polynomial equations by factoring
    - Find zeros and intercepts of a polynomial function by factoring
    - Use factoring to solve application problems involving polynomial equations

Chapter 6: Rational Expressions and Functions

6.1 Multiply and Divide Rational Expressions

- Domain of Rational Expressions and Simplifying Rational Expressions
    - Determine which values make a rational expression undefined
    - Simplify rational expressions - IA
- Multiplying and Dividing Rational Expressions
    - Multiply two rational expressions
    - Divide rational expressions, including those written as complex fractions
    - Multiply and divide rational functions

6.2 Add and Subtract Rational Expressions

- Adding and Subtracting Rational Expressions
  - Add or subtract rational expressions with a common denominator or with denominators that are opposites
  - Determine the least common denominator of rational expressions
  - Add or subtract rational expressions with unlike denominators
  - Add and subtract rational functions

6.3 Simplify Complex Rational Expressions

- Simplifying Complex Rational Expressions
  - Simplify complex rational expressions by writing the expression as division
  - Simplify complex rational expressions by using the least common denominator

6.4 Solve Rational Equations

- Solving Rational Equations and Using Rational Functions
  - Solve rational equations
  - Use rational equations to find points on the graph of a rational function
  - Rewrite a rational equation in terms of a specific variable

6.5 Solve Applications with Rational Equations

- Proportions and Similar Figures with Rational Equations
  - Solve problems involving proportions
  - Solve application problems involving similar figures
- Uniform Motion, Work, and Problem Solving
  - Use rational equations to solve uniform motion applications
  - Use rational equations to solve problems involving rates of work
- Variation and Problem Solving
  - Solve problems involving direct variation
  - Solve problems involving inverse variation

6.6 Solve Rational Inequalities

- Solving Rational Inequalities
  - Find the solution set of a rational inequality
  - Solve an inequality with rational functions

Chapter 7: Roots and Radicals

7.1 Simplify Expressions with Roots

- Understanding Radical Expressions
  - Estimate and approximate roots
  - Simplify a variable expression with even or odd roots
  - Simplify a numerical expression with even or odd roots

7.2 Simplify Radical Expressions

- Simplifying Radical Expressions
  - Use the product property to simplify radical expressions
  - Use the quotient property to simplify radical expressions

7.3 Simplify Rational Exponents

- Rational Exponents
  - Simplify an expression with rational exponents and a numerator of 1

- Simplify an expression with rational exponents and a numerator greater than 1
- Use the properties of exponents to simplify expressions with rational exponents

7.4 Add, Subtract, and Multiply Radical Expressions

- Operations with Radical Expressions
  - Add and subtract radical expressions
  - Multiply radical expressions
  - Use polynomial multiplication to multiply radical expressions
  - Use special product formulas to multiply radical expressions

7.5 Divide Radical Expressions

- Dividing Radical Expressions and Rationalizing Denominators
  - Divide radical expressions
  - Rationalize a denominator when the denominator is a monomial
  - Rationalize a denominator when the denominator is a binomial

7.6 Solve Radical Equations

- Solving Radical Expressions
  - Solve square root equations containing a single radical
  - Solve a radical equation with a single radical or an equation with a rational exponent
  - Solve a radical equation with two radicals
  - Solve application problems involving radical equations

7.7 Use Radicals in Functions

- Radical Functions
  - Evaluate a radical function - IA
  - Find the domain of a radical function
  - Graph a radical function by plotting points and determine its range

7.8 Use the Complex Number System

- Introduction to Complex Numbers
  - Evaluate the square root of a negative number and understand the complex number system
  - Add or subtract complex numbers
- Multiplying and Dividing Complex Numbers and Powers of i
  - Multiply complex numbers
  - Multiply two complex conjugates
  - Divide complex numbers
  - Simplify powers of i - IA

Chapter 8: Quadratic Equations and Functions

8.1 Solve Quadratic Equations Using the Square Root Property

- Solving Quadratic Equations Using the Square Root Property
  - Solve quadratic equations using the square root property
  - Solve quadratic equations with a binomial as the quadratic term using the square root property

8.2 Solve Quadratic Equations by Completing the Square

- Solving Quadratic Equations by Completing the Square
  - Find the term that completes the square of a quadratic expression

- Solve quadratic equations with a leading coefficient of 1 by completing the square
- Solve quadratic equations with a leading coefficient greater than 1 by completing the square

8.3 Solve Quadratic Equations Using the Quadratic Formula

- Solving Quadratic Equations Using the Quadratic Formula
  - Solve quadratic equations using the quadratic formula with two real solutions
  - Solve quadratic equations using the quadratic formula with one or no real solutions
  - Determine the number and type of solutions of a quadratic equation by using the discriminant

8.4 Solve Quadratic Equations in Quadratic Form

- Solving Equations by Using Quadratic Methods
  - Solve an equation in quadratic form by using substitution
  - Solve an equation in quadratic form with rational or negative exponents by using substitution

8.5 Solve Applications of Quadratic Equations

- Problem Solving with Quadratic Equations
  - Solve an application problem modeled by a quadratic equation
  - Solve a geometric application problem where the quadratic formula may be required

8.6 Graph Quadratic Functions Using Properties

- Parabolas and Their Properties
  - Graph a quadratic function by plotting points and determine the direction a parabola opens
  - Determine the axis of symmetry and vertex of a parabola given a function
  - Determine the intercepts of a parabola given a function
- Graphing Quadratic Functions
  - Graph a quadratic function by finding key points
  - Determine the minimum or maximum of a quadratic function and use it in applications

8.7 Graph Quadratic Functions Using Transformations

- Transformations of Parabolas
  - Graph a quadratic function using a vertical translation
  - Graph a quadratic function using a horizontal translation
  - Graph a quadratic function by compression, stretching, or reflecting
- Graphing Quadratic Functions Using Transformations
  - Rewrite a quadratic in vertex form and graph it using transformations
  - Find a quadratic function given its graph

8.8 Solve Quadratic Inequalities

- Solving Quadratic Inequalities
  - Solve a quadratic inequality graphically
  - Solve a quadratic inequality algebraically

Chapter 9: Inverse Functions, Distance and Midpoint Formulas, and Circles

9.1 Finding Composite and Inverse Functions

- Composite Functions
  - Perform a composition of functions
  - Evaluate a composition of functions for a specific value

- One-to-One Functions
  - Determine whether a function is one-to-one given a set of ordered pairs
  - Use the horizontal line test to determine whether a graph represents a one-to-one function
- Inverse Functions
  - Find the inverse of a function given a set of ordered pairs or a graph
  - Verify that two functions are inverses of each other
  - Find the inverse of a function algebraically

9.2 Distance and Midpoint Formulas and Circles

- The Distance and Midpoint Formulas
  - Use the distance formula to find the distance between two points
  - Use the midpoint formula to find the midpoint between two points
- The Equation of Circles
  - Write the standard form of the equation of a circle given its center and radius
  - Write the standard form of the equation of a circle given its center and a point on the circle
  - Graph a circle given its equation in standard form
  - Rewrite the equation of a circle given in general form by completing the square