Unit Content Coverage

For MATH 095, College Prep Mathematics

e-text: Trigsted, Bodden, & Gallaher, Developmental Mathematics

Unit Content Coverage Summary

Unit 1: Math Topics: Basic Geometry Formulas, Basic Statistics, Basic Algebraic Expressions & Equations
Unit 2: Linear Equations and Algebra Basics
Unit 3: Ratios, Proportions and Percents
Unit 4: Lines
Unit 5: Exponents and Polynomials
Unit 6: Factoring Polynomials
Unit 7: Quadratic Equations and Relations & Functions
Unit 8: Rational Expressions and Equations
Unit 9: Radical Functions
Unit 10: Systems of Linear Equations
Unit 11: Inequalities in One and Two Variables, Systems of Linear Inequalities
Unit 12: Transformations of Graphs and Intro to Exponential & Logarithmic Functions

Unit Content Coverage Detail

Unit 1: Math Topics: Basic Geometry Formulas, Basic Statistics, Basic Algebraic Expressions & Equations

- Find the mean, median, and mode.
- Estimate the probability of an event.
- Find the perimeter and area of common polygons.
- Find the circumference and area of circles.
- Find the perimeter and area of figures formed from two or more common polygons.
- Solve applications involving perimeter, circumference, or area.
- Make conversions involving mixed units of length.
- Make conversions involving American and Metric units of length.
- Plot real numbers on a number line.
- Find the opposite of a real number.
- Find the absolute value of a real number.
- Translate word statements involving addition and subtraction.
- Solve applications involving addition and subtraction of real numbers.
- Solve applications involving multiplication and division of real numbers.
- Evaluate exponential expressions.
- Use the order of operations to evaluate numeric expressions.
- Evaluate algebraic expressions.
- Use the commutative and associative properties.
- Use the distributive property.
- Use the identity and inverse properties.

- Identify terms, coefficients, and like terms of an algebraic expression.
- Simplify algebraic expressions.
- Solve applied problems involving algebraic expressions.
- Write word statements as algebraic expressions.

Unit 2: Linear Equations and Algebra Basics

- Solve equations using both the addition and the multiplication properties of equality.
- Identify linear equations in one variable.
- Solve linear equations involving non-simplified expressions.
- Solve linear equations involving grouping symbols.
- Multiply and divide fractions.
- Add and subtract fractions.
- Determine if a fraction is a solution to an equation.
- Use the properties of equality to solve linear equations involving fractions.
- Solve linear equations by clearing fractions.
- Determine if a decimal is a solution to an equation.
- Use the properties of equality to solve linear equations involving decimals.
- Solve linear equations by clearing decimals.
- Use linear equations to solve application problems involving decimals.
- Solve linear equations containing non-simplified expressions.
- Solve linear equations containing fractions or decimals.
- Identify contradictions and identities.
- Use linear equations to solve application problems.
- Translate word statements into equations.
- Solve applications using linear equations.
- Use the problem solving strategy to solve direct translation problems.
- Solve problems involving geometry formulas.
- Solve problems involving related quantities, consecutive integers, or cost.
- Evaluate a formula.
- Find the value of a non-isolated variable in a formula.
- Solve a formula for a given variable.

Unit 3: Ratios, Proportions, and Percents

- Write two quantities as a ratio or a rate.
- Find a unit rate.
- Compare unit prices.
- Write proportions.
- Determine whether proportions are true or false.
- Solve proportions.
- Use proportions to solve applications.
- Find unknown lengths of sides in similar triangles.
- Solve applications involving similar triangles.
- Find square roots.
- Approximate square roots.

- Use the Pythagorean Theorem.
- Solve applications using the Pythagorean Theorem.
- Translate word statements into percent equations.
- Solve percent equations.
- Solve problems by using a percent equation.
- Write percent problems as proportions.
- Solve percent problems using proportions.
- Solve applications involving percent.
- Compute simple interest.
- Compute compound interest.
- Solve percent problems involving discount, markups, and sales tax.
- Solve percent of change problems.
- Solve mixture problems.

Unit 4: Lines

- Read line graphs.
- Identify points in the rectangular coordinate system.
- Plot ordered pairs in the rectangular coordinate system.
- Create scatter plots.
- Determine if an ordered pair is a solution to an equation.
- Determine the unknown coordinate of an ordered pair solution.
- Graph linear equations by plotting points.
- Graph simple functions by plotting points.
- Find x- and y- intercepts.
- Graph linear equations using intercepts.
- Use linear equations to model data.
- Graph horizontal and vertical lines.
- Find the slope of a line given two points.
- Find the slope of horizontal and vertical lines.
- Graph a line using the slope and a point.
- Find and use the slopes of parallel and perpendicular lines.
- Use slope in applications.
- Determine the slope and y-intercept from a linear equation.
- Use the slope-intercept form to graph a linear equation.
- Write the equation of a line given its slope and y-intercept.
- Write the equation of a line given its slope and a point on the line.
- Write the equation of a line given two points.
- Determine the relationship between two lines.
- Use linear equations to solve applications.

Unit 5: Exponents and Polynomials

- Simplify exponential expressions using the product rule or the quotient rule.
- Use the zero-power rule.
- Use the power-to-power rule.

- Use the product-to-power rule.
- Use the quotient-to-power rule.
- Simplify exponential expressions using a combination of rules.
- Use the negative power rule.
- Simplify expressions containing negative exponents using a combination of rules.
- Classify polynomials as monomial, binomial, or trinomial.
- Determine the degree and coefficient of a monomial.
- Determine the degree and leading coefficient of a polynomial.
- Evaluate a polynomial for a given value.
- Simplify polynomials by combining like terms.
- Add polynomials.
- Find the opposite of a polynomial.
- Subtract polynomials.
- Multiply monomials.
- Multiply a polynomial by a monomial.
- Multiply two binomials.
- Multiply two or more polynomials.
- Square a binomial sum.
- Square a binomial difference.
- Multiply the sum and difference of two terms.
- Determine the degree of a polynomial in several variables.
- Evaluate polynomials in several variables.
- Add or subtract polynomials in several variables.
- Multiply polynomials in several variables.

Unit 6: Factoring Polynomials

- Find the greatest common factor of a group of integers.
- Find the greatest common factor of a group of monomials.
- Factor out the greatest common factor from a polynomial.
- Factor by grouping.
- Factor trinomials of the form $x^2 + bx + c$
- Factor trinomials of the form $x^2 + bxy + cy^2$
- Factor trinomials of the form $ax^2 + bx + c$
- Factor trinomials of the form $ax^2 + bxy + cy^2$
- Factor trinomials of the form $ax^2 + bx + c$ after factoring out the GCF.
- Factor trinomials of the form $ax^2 + bx + c$ using the ac method.
- Factor the difference of two squares.
- Factor perfect square trinomials.
- Factor the sum or difference of two cubes.
- Factor polynomials completely.

Unit 7: Quadratic Equations and Relations & Functions

- Solve quadratic equations by factoring.
- Solve polynomial equations by factoring.

- Solve quadratic equations using the square root property.
- Use the discriminant to determine the number of and type of solutions to a quadratic function.
- Solve quadratic equations using the quadratic formula.
- Solve application problems involving geometric figures.
- Solve application problems using the Pythagorean Theorem.
- Solve application problems involving quadratic models.
- Solve applications involving unknown numbers.
- Solve applications involving projectile motion.
- Solve applications involving geometric formulas.
- Solve applications involving distance, rate, and time.
- Solve applications involving work.
- Find the distance between two points.
- Find the midpoint of a line segment.
- Write the standard form of an equation of a circle.
- Sketch the graph of a circle given in standard form.
- Find the domain and range of a relation.
- Determine if relations are functions.
- Identify a function with the vertical line test.
- Express equations of functions using function notation.
- Evaluate functions.
- Find the domain of a polynomial or rational function.
- Find the sum, difference, and product of functions.
- Interpret graphs of functions.
- Solve application problems involving functions.

Unit 8: Rational Expressions and Equations

- Evaluate rational expressions.
- Find restricted values for rational expressions.
- Simplify rational expressions.
- Divide monomials.
- Divide a polynomial by a monomial.
- Multiply and divide rational expressions.
- Find the least common denominator of rational expressions.
- Write equivalent rational expressions.
- Add and subtract rational expressions with common denominators.
- Add and subtract rational expressions with unlike denominators.
- Simplify complex fractions.
- Simplify complex rational expressions by first simplifying the numerator and denominator.
- Simplify complex rational expressions by multiplying by a common denominator.
- Identify rational equations.
- Solve rational equations.
- Identify and solve proportions.
- Solve a formula containing rational expressions for a given variable.
- Use proportions to solve problems.

- Use formulas containing rational expressions to solve problems.
- Solve uniform motion problems involving rational equations.
- Solve problems involving rate of work.

Unit 9: Radical Functions

- Find square roots of perfect squares.
- Approximate square roots.
- Simplify radical expressions of the form $\sqrt{a^2}$
- Find cube roots.
- Find and approximate n^{th} roots.
- Evaluate radical functions.
- Use the definition for rational exponents of the form $a^{\frac{1}{n}}$
- Use the definition for rational exponents of the form $a^{\frac{n}{m}}$
- Simplify exponential expressions involving rational exponents.
- Use rational exponents to simplify radical expressions.
- Simplify radical expressions using the product rule.
- Simplify radical expressions using the quotient rule.
- Add and subtract radical expressions.
- Multiply radical expressions.
- Rationalize denominators of radical expressions.
- Solve equations involving one radical expression.
- Solve equations involving two radical expressions.
- Use radical equations and models to solve application problems.
- Simplify powers of *i*.
- Simplify radicals with negative radicands.
- Add and subtract complex numbers.
- Multiply and divide complex numbers.

Unit 10: Systems of Linear Equations

- Determine if an ordered pair is a solution to a system of linear equations in two variables.
- Determine the number of solutions to a system without graphing.
- Solve systems of linear equations by graphing.
- Solve systems of linear equations by substitution.
- Solve special systems by substitution.
- Solve systems of linear equations by elimination.
- Solve special systems by elimination.
- Solve related quantity applications using systems of equations.
- Solve geometry applications using systems of equations.
- Solve uniform motion applications using systems of equations.
- Solve mixture applications using systems of equations.

Unit 11: Inequalities in One and Two Variables, Systems of Linear Inequalities

- Write the solution set of an inequality in set-builder notation.
- Graph the solution set of an inequality on a number line.

- Use interval notation to express the solution set of an inequality.
- Solve linear inequalities in one variable.
- Solve three-part inequalities.
- Use linear inequalities to solve application problems.
- Find the union and intersection of two sets.
- Solve compound linear inequalities in one variable.
- Solve absolute value equations and inequalities.
- Determine if an ordered pair is a solution to a linear inequality in two variables.
- Graph a linear inequality in two variables.
- Solve applications involving linear inequalities in two variables.
- Determine if an ordered pair is a solution to a system of linear inequalities in two variables.
- Graph systems of linear inequalities.
- Solve applications involving systems of linear inequalities.
- Solve polynomial inequalities.
- Solve rational inequalities.

Unit 12: Transformations of Graphs and Intro to Exponential & Logarithm Functions

- Identify the characteristics of a quadratic function from its graph.
- Graph quadratic functions by using translations.
- Graph quadratic functions of the form $f(x) = a(x - h)^2 + k$
- Find the vertex of a quadratic function by using the vertex formula.
- Maximize quadratic functions to solve application problems.
- Minimize quadratic functions to solve application problems.
- Evaluate radical functions.
- Find the domain of a radical function.
- Graph functions that contain square roots or cube roots.
- Use vertical shifts to graph functions.
- Use horizontal shifts to graph functions.
- Use reflections to graph functions.
- Use combinations of transformations to graph functions.
- Form and evaluate composite functions.
- Determine if a function is one-to-one using the horizontal line test.
- Find the inverse of a one-to-one function.
- Use the characteristics of exponential functions.
- Sketch the graphs of exponential functions using transformations.
- Solve exponential equations by relating the bases.
- Solve applications of exponential functions.
- Use the characteristics of the natural exponential function.
- Sketch the graphs of natural exponential functions using transformations.
- Solve natural exponential equations by relating the bases.
- Solve applications of the natural exponential function.
- Change from exponential to logarithmic form and vice versa.
- Evaluate logarithmic expressions.
- Use the properties of logarithms.

- Use the common and natural logarithms.
- Use the characteristics of logarithmic functions.