

UNIT CONTENT COVERAGE

MATH085 (Units 0-2), MATH097(Units 3-8), MATH098 (Units 9-12)

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

UNIT CONTENT COVERAGE SUMMARY

- Units 0-2:** Basic Operations on Whole Numbers, Integers, Decimals & Fractions; Basic Algebraic Expressions & Equations, Geometry, and Probability
- Unit 3:** Ratios, Proportions and Percentages
- 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

Units 0-2 (MATH 085): Basic Operations on Whole Numbers, Integers, Decimals & Fractions; Basic Algebraic Expressions & Equations, Geometry, and Probability

Operations with whole numbers and integers.

Round numbers.

Find opposite of numbers.

Find absolute value of numbers.

Identify prime and composite numbers.

Find prime factors.

Use the order of operations to evaluate numeric expressions.

Calculate and rewrite numbers using exponents and scientific notation.

Evaluate algebraic expressions.

Simplify algebraic expressions.

Use the distributive property.

Use the identity and inverse properties.
Identify terms, coefficients, and like terms of an algebraic expression.
Introduction to fractions and mixed numbers.
Multiply and divide fractions.
Add and subtract fractions.
Solve one-step equations.
Solve equations using both the addition and the multiplication properties of equality.
Find the mean, median, and mode.
Estimate the probability of an event.
Find the perimeter and area of common polygons.
Make conversions involving American and Metric units of length.
Write word statements as algebraic expressions.
Translate word statements into expressions or equations.
Identify a base and an exponent.
Evaluate exponential expressions.
Identify the base and exponent in exponential expressions.
Evaluate algebraic expressions.
Simplify algebraic expressions.
Convert between percentages, decimals, and fractions.
Solve equations using both the addition and the multiplication properties of equality.
Solve linear equations involving non-simplified expressions.
Solve linear equations involving grouping symbols.
Solve linear equations containing decimals.
Determine if a number is a solution to an equation.
Solve problems involving geometry formulas.
Evaluate a formula.

Unit 3: Ratios, Proportions, and Percentages

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.

Approximate square roots.
Find square roots.
Find cube 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

Solve linear equations by clearing fractions or decimals.
Identify contradictions and identities.
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.