

Course Description: Integrated Math 2 builds on the foundations of Algebra and Geometry by deepening students' understanding of functions, equations, and mathematical reasoning. Throughout the course, learners develop fluency with algebraic expressions, radicals, exponential relationships, polynomials, quadratic functions, and rational expressions while applying mathematical practices to solve complex problems. Students use multiple representations, including graphs, tables, equations, and verbal descriptions, to analyze and model real-world situations.

As the course progresses, learners investigate polynomial and rational functions, solve systems of equations, explore function operations, and examine inverse relationships. Students strengthen their ability to make connections among mathematical concepts, interpret data, and use technology to analyze patterns and construct models. Emphasis is placed on problem solving, critical thinking, precision, and communicating mathematical reasoning.

The second half of the course integrates probability, logic, proof, geometry, triangles, trigonometry, and circles. Learners develop formal reasoning skills through conjectures, proofs, and geometric investigations while applying geometric and trigonometric concepts to real-world contexts. By the end of the course, students will be prepared to analyze complex mathematical relationships, justify solutions, and apply algebraic and geometric reasoning across a variety of disciplines.

Module	Lesson Title	Objectives
Module 1 Tools of the Trade	1.1 Properties of Exponents	Simplify monomials and expressions involving powers.
	1.2 Evaluating Expressions	Evaluate expressions using order of operations.
	1.3 Solving Equations	- Translate between verbal representations and algebraic equations. - Apply properties of equality to solve algebraic equations.
	1.4 Using Formulas	Use formulas to find various measurements (volume, area, profit, temp conversion).

Module	Lesson Title	Objectives
	1.5 Solving Inequalities	- Solve one-step inequalities. - Solve multi-step inequalities.
	1.6 Absolute Value Equations	- Evaluate expressions with absolute value. - Solve absolute value equations.
	1.7 Compound Inequalities	- Solve compound inequalities. - Graph the solution sets of compound inequalities on the number lines.
	1.8 Absolute Value Inequalities	- Solve absolute value inequalities. - Graph the solution sets of absolute value inequalities on number lines.
	1.9 Adding and Subtracting with Complex Numbers	Add and subtract complex numbers.
	1.10 Multiplying and Dividing Complex Numbers	- Multiply complex numbers. - Divide complex numbers.
Module 2 Exponentials and Radicals	2.1 nth Roots	- Simplify radical expressions. - Approximate radical expressions (using a calculator).
	2.2 Operations with Radical Expressions	Add, subtract, multiply, and divide radical expressions.
	2.3 Rational Exponents	- Write expressions with rational exponents in radical form. - Convert expressions in radical form to exponential form.

Module	Lesson Title	Objectives
	2.4 Solving Radical Equations	Solve equations that contain radicals.
	2.5 Solving Radical Inequalities	Solve inequalities that contain radicals.
	2.6 Graphing, Square Root Function, Square Root Inequality	- Graph and analyze square root functions. - Graph square root inequalities.
	2.7 Exponential Growth	- Graph exponential growth functions. - Identify the domain and range of exponential growth functions.
	2.8 Exponential Decay	- Graph exponential decay functions. - Identify the domain and range of exponential decay functions.
	2.9 Exponential Equations and Inequalities	- Solve exponential equations. - Solve exponential inequalities.
Module 3 Working with Polynomials	3.1 Polynomials Defined	- Identify monomials, binomials, trinomials, and polynomials. - Name the parts of a polynomial, including variable(s), exponent(s), and coefficient(s). - Calculate the degree of a polynomial and name it. - Write a polynomial in standard form.
	3.2 Add & Subtract Polynomials	- Add polynomials. - Subtract polynomials. - Write the sum or difference of polynomials in standard form. - Explain that the sum or difference of polynomials is another polynomial.

Module	Lesson Title	Objectives
	3.3 Multiply by Monomials	• Multiply a monomial by a binomial using the distributive property. • Multiply a monomial by a trinomial using the distributive property. • Multiply a binomial by a trinomial using the box method.
	3.4 Multiplying Binomials	• Multiply two binomials using algebra tiles. • Multiply two binomials using the distributive method. • Multiply two binomials using the FOIL method.
	3.5 Other Multiplying Methods	• Multiply polynomials using the horizontal method. • Multiply polynomials using the vertical method. • Choose the best method for multiplying polynomials.
	3.6 Special Patterns	• Multiply binomials using the difference of squares pattern. • Multiply binomials using the perfect square trinomials pattern.
	3.7 Adding, Subtracting, and Multiplying Polynomials	• Add and subtract polynomial expressions. • Multiply polynomial expressions.
	3.8 Dividing Polynomials	• Divide polynomials using long division.
	3.9 Polynomial Graphs	• Recognize the graphs of polynomial functions. • Predict the end behavior of a polynomial function. • State the domain and range of a polynomial function.
Module 4 The	4.1 Factoring Using GCF	• Recognize when the terms of a polynomial share a common factor. • Factor a polynomial expression using the GCF.

Module	Lesson Title	Objectives
Quadratic Function	4.2 Factoring When $a = 1$	Factor a quadratic trinomial when $a = 1$.
	4.3 Factoring When $ a > 1$	- Factor a quadratic trinomial when $a > 1$. - Factor a quadratic trinomial using algebra tiles. - Factor a quadratic trinomial using the AC method.
	4.4 Factoring Patterns	- Apply the difference of squares pattern to factor binomials. - Apply the perfect square trinomial pattern to factor trinomials.
	4.5 Factoring by Grouping	Factor polynomials by grouping.
	4.6 The Best Factoring Method	- Choose the best factoring method for a given polynomial. - Factor polynomials completely.
	4.7 The Zero Product Property	- Interpret the solutions of a quadratic equation. - Define the zero product property. - Calculate the roots of a quadratic equation.
	4.8 The Quadratic Formula	- Solve for the roots of a quadratic equation using the quadratic formula. - Calculate the discriminant of a quadratic equation. - State the number of solutions for a quadratic equation based on the discriminant.
	4.9 Completing the Square	- Rewrite a quadratic equation by completing the square when $a=1$. - Rewrite a quadratic equation by completing the square when $a >1$. - Solve for the roots of a quadratic equation when it is written in vertex form.
Module 5 Rationals	5.1 Rational Expressions & GCF	- Define a rational expression. - Simplify a rational expression by factoring out the GCF. - Simplify a rational expression by factoring each expression into binomials.

Module	Lesson Title	Objectives
	5.2 Multiply Rational Expressions	• Multiply a rational expression by a constant and then simplify. • Multiply a rational expression by a monomial and then simplify. • Multiply two rational expressions and then simplify.
	5.3 Divide Rational Expressions	• State the reciprocal of a rational expression. • Divide rational expressions and then simplify their quotients.
	5.4 Add & Subtract Rationals	• Add and subtract rational expressions with like denominators and then simplify. • Determine the LCM of rational expressions. • Add and subtract rational expressions with unlike denominators and then simplify.
	5.5 Rationals & Cross Products	• Write a rational equation to represent a scenario. • Solve rational equations using cross products. • Identify extraneous solutions.
	5.6 Rational Equations & LCD	• Multiply rational equations by their LCD to eliminate fractions. • Solve rational equations using the LCD method. • Check solutions to rational equations.
	5.7 Rational Functions	• Locate the points of discontinuity in the graph of a rational function. • State the domain and range of a rational function from its graph. • State where the graph of a rational function is increasing or decreasing. • Describe the end behavior of the graph. • Interpret the graph of a rational function in context.
Module 6 Polynomials and Functions	6.1 Factoring Polynomials	• Factor polynomials by grouping. • Factor polynomials using sums and differences of cubes. • Factor higher-order polynomials using quadratic form.
	6.2 Solving Polynomial Equations	• Solve polynomial equations by factoring.
	6.3 Finding Rational Zeros	• Identify possible rational zeros of a polynomial function. • Find the rational zeros of a polynomial function.

Module	Lesson Title	Objectives
	6.4 Modeling With Polynomial Functions	• Use technology to graph polynomial equations. • Use the graphs of polynomial equations to find relative and absolute extrema. • Use graphs of polynomial equations to solve word problems dealing with extrema.
	6.5 Graphing Polynomial Functions	• Sketch the graph of a polynomial using definable characteristics from its polynomial equation.
	6.6 Systems Involving Polynomials	• State the solution of a system of equations involving at least one polynomial function, using the graph. • Write a system of equations that involves at least one polynomial to represent a scenario. • Graph a system of equations that involves at least one polynomial, using technology.
	6.7 Adding and Subtracting Functions	• Find the sum and difference of functions.
	6.8 Multiplying and Dividing Functions	• Find the product and quotient of functions.
	6.9 Composition of Functions	• Find the composition of functions. • Use compositions of functions in real-world problems.
	6.10 Inverse Relations and Functions	• Find the inverse of a relation or a function. • Decide whether two functions or relations are inverses.