

Integrated Math 3, Part 1

Course Outline & Objectives

Course Description:

Integrated Math 3 is the third year of a three-year high school mathematics sequence. In Integrated Math 3 Part 1, students review how to solve linear equations and inequalities and systems of equations. They explore different function families, including linear, quadratic, polynomial, radical, and rational functions, and develop skills to solve and graph different types of equations.

Credits - One Semester (0.5 Carnegie unit / CA: 5 credits)

Prerequisites: Integrated Math 1; Integrated Math 2

Course Outline

Unit 1 – Linear Equations and Inequalities

- 1.1 Solving Linear Equations in One Variable
- 1.2 Solving Linear Equations in One Variable - Multiple Steps
- 1.3 Arithmetic Sequence and Series
- 1.4 Linear Inequalities and Compound Linear Inequalities
- 1.5 Absolute Value Equations and Inequalities

Unit 2 – Linear Functions

- 2.1 What is a Function?
- 2.2 Calculating Slope and Slope-Intercept Form
- 2.3 Parallel and Perpendicular Lines
- 2.4 Writing Equations of Lines
- 2.5 Geometry on the Coordinate Plane
- 2.6 Modeling Linear Equations

Common Core Standards

In this unit:

Students will review linear equations and how to solve them. They will solve multistep linear equations involving distribution, fractions, and decimals. They will analyze patterns and learn to recognize an arithmetic sequence, and then learn to find the sum of a finite number of terms. They will solve and graph multiple-step inequalities in one variable. They will solve and graph compound inequalities in one variable. They will solve and graph absolute value equations and inequalities in one variable.

[A-REI-A.1, A-REI-A.2, A-REI-B.3, F-BF-A.1, F-BF-A.2]

In this unit

Students will recognize functions based on a set of data, graphs, and descriptions. They will calculate slope, identify slope given points and lines, and identify the slope of the graphed line. They will identify characteristics of parallel and perpendicular lines and write the equations of lines that are parallel and perpendicular to a given line. They will apply the characteristics of parallel and perpendicular lines on the coordinate plane to polygons. They will model real-world problems with linear equations.

[F-IF-A-1, F-IF-B-6, F-IF-C-7-A, F-LE-A, G-GPE-B-4, G-GPE-B-5]

Course Outline

Unit 3 – Systems of Linear Equations

- 3.1 Graphing Systems of Linear Functions
- 3.2 Solving Systems of Linear Functions
- 3.3. Graphing Inequality Functions & Systems of Inequality Functions
- 3.4 Graphing & Solving Linear Equations - 3 Variables
- 3.5 Modeling Systems of Equations

Unit 4 – Quadratic Equations and Functions

- 4.1 Solving Quadratic Equations - Factoring
- 4.2. Solving Quadratic Equations by Completing the Square and the Quadratic Formula
- 4.3 Quadratics with Complex Roots
- 4.4 Graphing Quadratic Functions
- 4.5 Piecewise Functions

Unit 5 – Polynomial Equations and Functions

- 5.1 What is a Polynomial? Computations with Polynomials
- 5.2 Multiplication of Polynomials
- 5.3 Long Division of Polynomials
- 5.4 Synthetic Division / Remainder Theorem
- 5.5 Rational Roots Theorem
- 5.6 Zeros and Factors of Polynomials
- 5.7 Fundamental Theorem of Algebra

Common Core Standards

In this unit:

Students will identify lines that have a single solution, graph systems of equations to determine a solution, and recognize characteristics of pairs of lines that result in consistent and inconsistent equations. They will solve systems of equations by substitution and elimination methods. They will solve systems of inequalities by graphing. They will write pairs of equations to model real-world problems and model equations with three variables. They will solve systems of three equations and three variables.

[A-CED-A-2, A-CED-A-3, A-REI-C-6, A-REI-C-7, A-REI.D.10]

In this unit:

Students will learn the various forms of a quadratic equation and how to solve a quadratic equation by factoring. They will learn how to use the process of completing the square to write a quadratic function in the vertex form. They will solve non-factorable quadratic equations by using the quadratic formula. They will learn how to find the square root of a negative number and other properties of imaginary numbers. They will analyze a quadratic function such as identifying the domain, range, maximum and minimum points. They will learn how to graph piecewise functions that include linear and quadratic functions.

[A-REI-B-3, A-REI-B-4, A-REI-D-10, N-CN-C]

In this unit:

Students will identify polynomials and add and subtract polynomials. They will multiply a monomial by a polynomial and learn how to multiply polynomials with a varying number of terms. They will use long division to divide polynomials that cannot be factored. They will use synthetic division to determine remainders and apply this to evaluating polynomials. They will use the Remainder and Factor theorem to decompose a polynomial into the product of binomials. They will apply the conjugate and real root theorem to identify the factors of polynomials as well as write the equation of polynomials given roots. They will apply the Fundamental Theorem of Algebra to determine the number of roots of a polynomial, the roots and write a polynomial given roots.

[A-APR-A, A-APR-B-2, A-APR-B-3, A-APR-C-4, A-APR-C-5, A-APR-D-6, APR-D-7, N-CN-A, N-CN-C]

Course Outline

Unit 6 – Radical Equations and Functions

- 6.1 Exponents and Expressions
- 6.2 Rational Exponents
- 6.3 Computations with Radical Expressions
- 6.4 Solving Radical Equations
- 6.5 Graphing Radical Functions

Unit 7 – Rational Expressions, Equations and Functions

- 7.1 Simplifying Rational Expressions
- 7.2 Multiplying & Dividing Rational Expressions
- 7.3 Solving Rational Equations
- 7.4 Graphing Rational Functions
- 7.5 Modeling with Rational Functions and Expressions

Common Core Standards

In this unit:

Students will simplify exponents, solve equations with exponents, simplify with rational exponents, and raise an exponent to a power. They will divide with exponents and simplify negative exponents. They will simplify radicals, rationalize denominators, and compute with radicals. They will solve radical equations with one and two radicals. They will graph radical functions and transform from a parent function.

[A-SSE-A-1, A-SSE-A-2, A-SSE-B-3, F-LE-A-1, F-LE-A-2, F-LE-A-3, F-LE-B-5]

In this unit:

Students will simplify, add and subtract rational expressions. They will multiply and divide rational expressions. They will solve rational equations. They will analyze rational equations including asymptotes, end behavior, and zeros.

[A-APR-D-6, A-APR-D-7, F-BF-A, F-IF-C-7-D, F-IF-C-9]