

# Course Syllabus

## Description:

Starting with a review of basic algebra, you will learn polynomials, quadratic equations, exponential and logarithmic relations, and probability and statistics. Throughout the course, these mathematical concepts are applied to everyday occurrences to get a better understanding of how the world around us functions.

**Estimated Completion Time:** 2 segments / 32-36 weeks

## Major Topics and Concepts:

### Segment I:

#### Module 01: Review of Algebra

- 01.00: Introduction and Pretest
- 01.01: Algebra 1 Review
- 01.02: Introduction to Functions
- 01.03: Module One Quiz
- 01.04: Graphing Linear Equations and Inequalities
- 01.05: Writing the Equation of a Line
- 01.06: Comparing Functions
- 01.07: Module One Review and Practice Test
- 01.08: Discussion-Based Assessment
- 01.09: Module One Test

#### Module 02: Rational, Complex, and Polynomials

- 02.00: Module Two Pretest
- 02.01: Rational Exponents
- 02.02: Properties of Rational Exponents
- 02.03: Solving Radical Equations
- 02.04: Module Two Quiz
- 02.05: Complex Numbers
- 02.06: Operations of Complex Numbers
- 02.07: Review of Polynomials
- 02.08: Polynomial Operations
- 02.09: Module Two Review and Practice Test
- 02.10: Discussion-Based Assessment
- 02.11: Module Two Test

#### Module 03: Factoring and Quadratics

- 03.00: Module Three Pretest
- 03.01: Greatest Common Factors and Special Products
- 03.02: Factoring by Grouping
- 03.03: Sum and Difference of Cubes
- 03.04: Graphing Quadratics
- 03.05: Module Three Quiz
- 03.06: Completing the Square
- 03.07: Solving Quadratic Equations
- 03.08: Solving Quadratic Equations with Complex Solutions

- 03.08: Solving Quadratic Equations with Complex Solutions
- 03.09: Investigating Quadratics
- 03.10: Module Three Review and Practice Test
- 03.11: Discussion-Based Assessment
- 03.12: Module Three Test

#### **Module 04: Dividing and Solving Polynomials**

- 04.00: Module Four Pretest
- 04.01: Polynomial Long Division
- 04.02: Polynomial Synthetic Division
- 04.03: Theorems of Algebra
- 04.04: Rational Root Theorem and Descartes' Rule of Signs
- 04.05: Solving Polynomial Equations
- 04.06: Module Four Quiz
- 04.07: Graphing Polynomial Functions
- 04.08: Polynomial Identities and Proofs
- 04.09: Module Four Review and Practice Test
- 04.10: Discussion-Based Assessment
- 04.11: Module Four Test

#### **Module 05: Rational Expressions**

- 05.00: Module Five Pretest
- 05.01: Simplifying Rational Expressions
- 05.02: Multiplying and Dividing Rational Expressions
- 05.03: Adding and Subtracting Rational Expressions
- 05.04: Simplifying Complex Fractions
- 05.05: Module Five Quiz
- 05.06: Discontinuities of Rational Expressions
- 05.07: Asymptotes of Rational Functions
- 05.08: Solving Rational Equations
- 05.09: Applications of Rational Equations
- 05.10: End-of-Module Check
- 05.11: Module Five Review and Practice Test
- 05.12: Discussion-Based Assessment
- 05.13: Module Five Test
- 05.14: Segment One Check
- 05.15: Segment One Exam Review
- 05.16: Segment One Exam

#### **Segment II**

#### **Module 06: Systems of Equations and Inequalities**

- 06.00: Module Six Pretest
- 06.01: Solving Systems of Equations Algebraically
- 06.02: Solving Systems of Nonlinear Equations
- 06.03: Graphing Systems of Linear Equations
- 06.04: Module Six Quiz
- 06.05: Graphing Systems of Nonlinear Equations
- 06.06: Module Six Review and Practice Test
- 06.07: Discussion-Based Assessment
- 06.08: Module Six Test

- 06.00: Module Six Test

## **Module 07: Exponential and Logarithmic Functions**

- 07.00: Module Seven Pretest
- 07.01: Exponential Functions
- 07.02: Logarithmic Functions
- 07.03: Properties of Logarithms
- 07.04: Solving Exponential Equations with Unequal Bases
- 07.05: Module Seven Quiz
- 07.06: Graphing Exponential Functions
- 07.07: Graphing Logarithmic Functions
- 07.08: Exponential and Logarithmic Functions
- 07.09: Module Seven Review and Practice Test
- 07.10: Discussion-Based Assessment
- 07.11: Module Seven Test

## **Module 08: Sequences and Series**

- 08.00: Module Eight Pretest
- 08.01: Arithmetic Sequences
- 08.02: Arithmetic Series
- 08.03: Geometric Sequences
- 08.04: Geometric Series
- 08.05: Module Eight Quiz
- 08.06: Sigma Notation
- 08.07: Infinite, Convergent, and Divergent Series
- 08.08: Graphing Sequences and Series
- 08.09: Module Eight Review and Practice Test
- 08.10: Discussion-Based Assessment
- 08.11: Module Eight Test

## **Module 09: Statistics**

- 09.00: Module Nine Pretest
- 09.01: Events and Outcomes in a Sample Space
- 09.02: Independent Probability
- 09.03: Conditional Probability
- 09.04: Module Nine Quiz
- 09.05: Normal Distribution
- 09.06: Models of Populations
- 09.07: Using Surveys
- 09.08: Using Experiments
- 09.09: Module Nine Review and Practice Test
- 09.10: Discussion-Based Assessment
- 09.11: Module Nine Test

## **Module 10: Trigonometry**

- 10.00: Module Ten Pretest
- 10.01: Introduction to the Unit Circle
- 10.02: Unit Circle and the Coordinate Plane
- 10.03: Module Ten Quiz

- 10.04: Trigonometric Functions with Periodic Phenomena
- 10.05: Pythagoras, Trigonometry, and Quadrants
- 10.06: Functions of All Types
- 10.07: End-of-Module Check
- 10.08: Module Ten Review and Practice Test
- 10.09: Discussion-Based Assessment
- 10.10: Module Ten Test
- 10.11: Segment Two Check
- 10.12: Segment Two Exam Review
- 10.13: Segment Two Exam

**Course Assessment and Participation Requirements:**

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, “any pace” still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice lessons, multiple choice questions, projects, discussion-based assessments, and discussions. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and parents work together, students are successful.