

NORTH ALLEGHENY SCHOOL DISTRICT

MATHEMATICS DEPARTMENT

ACADEMIC ALGEBRA 2 SYLLABUS

COURSE NUMBER: 3103

Units of Credit: 1

Course Length: 184 days

Instructors:

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Course Overview

This is the third year of an academic mathematics sequence including Academic Algebra 1 and Academic Geometry. The content of this course is organized around families of functions, including linear, quadratic, exponential, logarithmic, radical, and rational functions. Students will also learn to model real-world situations using functions.

Textbook

Larson, Boswell, Kanold, Stiff, Algebra 2, Illinois: Houghton Mifflin Company, 2007.

Course Outline

The following topics are covered in Academic Algebra 2:

Chapter 1: Equations and Inequalities

- Apply Properties of Real Numbers
- Evaluate and Simplify Algebraic Expressions
- Solve Linear Equations
- Use Problem Solving Strategies and Models
- Solve Linear Inequalities
- Solve Absolute Value Equations and Inequalities

Chapter 2: Linear Equations and Functions

- Represent Relations and Functions
- Find Slope and Rate of Change
- Graph Equations of Lines
- Write Equations of Lines
- Model Direct Variation
- Draw Scatter Plots and Best-Fitting Lines
- Use Absolute Value Functions and Transformations
- Graph Linear Inequalities in Two Variables

Chapter 3: Linear Systems and Matrices

- Solve Linear Systems by Graphing
- Solve Linear Systems Algebraically
- Graph Systems of Linear Inequalities
- Solve Systems of Linear Equations in Three Variables
- Perform Basic Matrix Operations
- Multiply Matrices
- Solve systems using technology.

Chapter 4: Quadratic Functions and Factoring

- Graph Quadratic Functions in Standard Form
- Graph Quadratic Functions in Vertex or Intercept Form
- Solve $x^2 + bx + c = 0$ by Factoring
- Solve $ax^2 + bx + c = 0$ by Factoring
- Solve Quadratic Equations by Finding Square Roots
- Perform Operations with Complex Numbers
- Complete the Square
- Use Quadratic Formula and the Discriminant

Common Assessment for Chapters 1 through 4

Chapter 5: Polynomials and Polynomial Functions

- Use Properties of Exponents
- Evaluate and Graph Polynomial Functions
- Add, Subtract, and Multiply Polynomials
- Factor and Solve Polynomial Equations

Chapter 6: Rational Exponents and Radical Functions

- Evaluate n th Roots and Use Rational Exponents
- Apply Properties of Rational Exponents
- Perform Function Operations and Composition
- Use Inverse Functions
- Graph Square Root and Cube Root Functions
- Solve Radical Equations

Chapter 7: Exponential and Logarithmic Functions

- Graph Exponential Growth Functions
- Graph Exponential Decay Functions
- Use Functions Involving e
- Evaluate Logarithms and Graph Logarithmic Functions
- Apply Properties of Logarithms
- Solve Exponential and Logarithmic Equations

Chapter 8: Rational Functions

- Model Inverse and Joint Variation
- Graph Simple Rational Functions
- Graph General Rational Functions
- Multiply and Divide Rational Functions
- Add and Subtract Rational Functions
- Solve Rational Equations

Chapter 10: Counting Methods and Probability

- Apply the Counting Principle and Permutations
- Use Combinations and the Binomial Theorem
- Define and use Probability
- Find Probabilities of Disjoint and Overlapping Events

Common Math Assessment Chapters 5, 6,7,8,10

Expected levels of student achievement

Course grades will be determined by the collective point totals from assessments, homework, classroom projects/participation and standardized test preparation assignments. It is expected that all students will participate in daily classroom activities and maintain a notebook. Students must complete all assigned work and participate in class discussion.

Technology description

Students are expected to continue to grow in their use of technology. Students are expected to obtain a graphics calculator. We recommend purchasing from the Texas Instruments TI-84 family of calculators. Students are expected to access online resources and grades.

Standardized Test Preparation

The North Allegheny Mathematics Curriculum is designed to prepare students for standardized tests while meeting Pennsylvania State Mathematics Standards and Eligible Content. The focus will be on numbers and operations, algebraic concepts, geometry, data analysis and probability, and measurement. Students will be expected to complete Open Ended tasks throughout the course.