Advanced Algebra II

This course is a full year, comprehensive college preparatory course exploring all high school Algebra II concepts. This class teaches and requires students to demonstrate an understanding of concepts and procedures, reason abstractly and quantitatively, communicate reasoning clearly, model with mathematics, solve problems, and analyze data. Throughout the course, students will apply knowledge and skills to solve real-world problems. Students who successfully complete this course, will have demonstrated proficiency in Algebra II math standards and will be ready for Pre-Calculus and Statistics courses. In alignment with the skills detailed in the **Portrait of the Crusader,** students practice solving problems with innovation and imagination, and they are taught to think critically about the synthesis of data and respond with defendable, original work.

Throughout the course, teachers strive to include varied assessments, including traditional quizzes and tests to measure discrete skills; problem/solution/explanation opportunities where students solve a complex problem and communicate their reasoning; and real-world scenarios where students define the problem, develop a plan, and solve the problem, adjusting as necessary and communicating their reasoning when required.

Essential Questions

1. How do we represent patterns and operations using algebra?
2. How do we interpret and analyze real life situations using algebra?
3. How do we use technology to solve and/or visualize mathematical sentences?

Curriculum Framework

FIrst Quarter:

Summer Work to Reinforce Prerequisite Skills:

- Solve linear equations
- Simplify expressions and equations
- Translate words into symbols
- Perform operations with real numbers
- Identify and graph slope and equations of lines
- Graph inequalities
- Solve and graph absolute value inequalities
- Model real world problem solving
- Solve systems of equations in two variables by graphing, substitution and elimination.
- Determine expected value (mean), median and mode (Statistics_

Extensions

- Solve problems using functions and systems
- Perform 3 x 3 systems
- Solve and graph linear systems of inequalities
- Interpret and analyze word problems.
- Use technology to solve problem

Second Quarter:
Matrices

- Perform matrix operations
- Solve matrix equations
- Use technology to assist with solving matrices

Functions

- Review Linear Functions
- Find domain and range of a function
- Perform function operations
- Solve composite functions
- Identify linear and nonlinear functions

Exponents & Polynomials

- Apply laws of exponents
- Evaluate negative exponents and zero exponents
- Perform operations involving exponents
- Simplify expressions involving exponents
- Perform operations with polynomials (factoring/distributing)

Third Quarter:
Factoring Polynomials

- Explain the purpose of factoring
- Factor polynomials by greatest common factor (GCF).
- Factor special products: difference of squares and sum/difference of cubes

Solving Equations

- Solve equations by factoring using the zero product property
- Solve equations by graphing and using technology.
- Apply the skills to solve real-world problems.

Radicals

- Simplify radicals and radical expressions
- Write radicals as rational exponents
- Write rational exponents as radicals
- Add, subtract, and multiply radicals
- Rationalize the denominator
- Solve radical equations
- Perform operations on complex/imaginary numbers

Fourth Quarter
Quadratic Functions

- Discover the properties and characteristics of quadratic functions algebraically and using graphing technology.
- Explain the properties and characteristics of quadratic functions; identify quadratic functions
- Solve equations using quadratic methods
- Determine the number and type of solutions using the discriminant
- Apply and solve real-world problems

Rational Expressions (if time permits)

- Simplify rational expressions
- Perform operations on rational expression
- Simplify complex fractions

Resources

- Algebra 2 Martin-Gay
- MyMathLab. (mymathlabforschool.com)
- Graphing Calculator (Suggested TI-84+)
- Desmos application (ISO/Android or web)

Grading Policy

- 20 % MyMathLab,
- 25% Quizzes
- 25% Student Work
- 30 % Tests