

Kendall Park Learning Center

Course Title: Honors Algebra II

Course Length: Six weeks (120 hours)

Description:

This course completes the study of elementary algebra and prepares students for the study of advanced mathematics. Algebra II furthers the students' knowledge on the topics covered in Algebra I. Emphasis is placed on mastering skills for problem solving and applying them outside of the classroom.

The topics addressed by Honors Algebra II include operating with real as well as imaginary numbers, analyzing the behavior of a variety of functions and using them to model real-life relationships, solving and graphing systems of equations and inequalities, sequences and series (including mathematical induction), and the study of conics. The main difference between this course and the Advanced Algebra II course is that the theoretical aspect of the course is treated in a more rigorous manner, while the applied aspect often requires students to apply the studied concepts in a non-procedural manner.

Prerequisites:

Algebra II is a course offered to students who have successfully completed Algebra I and Honors Geometry with at least a B+.

Requirement:

Students must pass with at least A- to receive full credit for this class.

Topics Covered:

Fundamental Concepts of Algebra

- Real Numbers
- Exponents and Radicals
- Algebraic Expressions
- Simplifying Rational Expressions

Equations and Inequalities

- Equations and Applied Problems
- Solving Quadratic Equations
- Complex Numbers
- Solving and Graphing Inequalities
- Solving Absolute Value Equations and Inequalities

Functions and Graphs

- Finding Distance and Midpoint
- Finding Intercepts
- Equation of the Circle

Vertical and Horizontal, Parallel and Perpendicular Lines
Slope Intercept Form and Point Slope Form
Increasing, Decreasing, and Constant Functions
Even and Odd Functions
Operations on Functions
Inverse Functions
Variation

Polynomial and Rational Functions

Polynomial Functions of Degree Greater Than 2
Properties of Division
Zeros of Polynomials
Complex and Rational Zeros of Polynomials
Rational Functions

Exponential and Logarithmic Functions

Exponential Functions
The Natural Exponential Function
Logarithmic Functions
Properties of Logarithms
Exponential and Logarithmic Equations

Trigonometric Functions

Angles
Trigonometric Functions of Angles
Trigonometric of Real Numbers
Values of the Trigonometric Functions
Trigonometric Graphs
Additional Trigonometric Graphs

Systems of Equations and Inequalities

Systems of Equations
Systems of Linear Equations in Two Variables
Systems of Inequalities
Systems of Linear Equations in More Than Two Variables
Matrices
Inverse of a Matrix
Determinants
Partial Fractions

Sequences, Series, and Probability

Infinite Sequences and Summation Notation
Arithmetic Sequences
Geometric Sequences

Mathematical Induction
The Binomial Theorem
Permutations
Probability

Analytic Geometry

Parabolas
Ellipses
Hyperbolas

Text:

Cole, J., Swokowski, E., Algebra and Trigonometry with Analytic Geometry. 11th ed.
Thompson Learning Inc. Pacific Grove, California. 2002.