

HONORS ALGEBRA II

The purpose of this course is to provide a challenging curriculum to those students that have displayed a mastery of the concepts studied in Algebra I and Geometry. Topics covered include the solution of linear, quadratic and higher degree equations as well as inequalities. Operations with complex numbers are studied and computations are done with exponents and logarithms. The equations and graphs of the conic sections are explored. Throughout the course the graphing calculator is used as a tool for finding solutions and practical applications are illustrated.

OBJECTIVES

1. To review and extend the topics learned in Algebra I to include applications and derivations.
2. To challenge the students to use logical reasoning skills to setup and solve problems
3. To study advanced algebra topics to provide the background needed for other coursework and
4. To provide practice in using appropriate technology.

SCOPE

I. Structure of the Number System

- A. Using the number line
- B. Using sets to show relationships
- C. Properties, including inverses, reciprocals, and closure

II. Solving Equations

- A. Linear equations with applications
- B. Quadratic equations with derivation of the quadratic formula and applications
- C. Complex number solutions to equations
- D. Simultaneous equations with two and three variable solved by
 1. Substitution and elimination
 2. Using determinants
 3. Using the graphing calculator
- E. Absolute value problems
- F. Solving rational equations and extraneous roots

III. Functions and Graphing

- A. Definitions and identifying functions and their domain and range
- B. Graphing using slope and intercepts
- C. Finding equations for linear functions using

1. Slope, y-intercept or two points
 2. using best-fit line
 3. using linear regression on the graphing calculator
- D. Solving work problems

IV. Inequalities

- A. Linear inequalities with two variables using graphing to show regions
- B. Quadratic inequalities solved by graphing
- C. Writing equations given the graph of an inequality
- D. Using graphing in applications to find optimum solutions

V. Polynomial Operations

- A. Add, subtract, multiply, and divide using synthetic division
- B. Factoring including sum and difference of cubes and grouping
- C. Finding zeroes of functions using synthetic division
- D. Finding solutions of higher degree equation using factoring, synthetic division and graphing

VI. Exponents and Radicals

- A. Properties and operations with rational exponents
- B. Graphing functions with square and cube roots
- C. Solving radical equations

VII. Exponential and Logarithmic Functions

- A. Exponential growth and decay
- B. Graphing and identifying asymptotes
- C. Simplifying expressions using different bases including e
- D. Properties of logarithms
- E. Solving exponential and logarithmic equations

VIII. Conic Sections

- A. Distance and midpoint formula
- B. Equations and graphs of circles, parabolas, ellipses and hyperbolas

TEXT

Algebra II, Larson, Boswell, Kanold, Stiff
McDougal Littell