

Advanced Algebra II

Semester One: 37 days of core content, 42 days

Textbook: *Algebra and Trigonometry – Functions and Applications*
by Foerster: Addison Wesley

Unit 1 – Preliminary Information – Review – 4½ days
Pages 1 – 49

Focus: Review of properties and solving equations/inequalities

Core Content:

MA-H-1.3.1

Students will understand how the following subsets of real numbers relate to each other: natural, whole, integers, rational, irrational, reals.

MA-H-4.1.2

Students will describe, give examples of, and recognize differences among expressions, equations, and inequalities.

Resources and Suggested:

Proficiency Exam, Omit 1.6

Unit 2 – Functions and Relations - 3 days
Pages 50 – 71

Focus: Graphing Relations and Functions

Core Content:

MA-H-4.1.1

Students will understand the concept of a function and roles of independent and dependent variables.

MA-H-4.2.5

Students will determine the domain and range of a function, the slope and intercepts of a linear function, and the maximum/minimum and intercepts of a quadratic function.

Resources and Suggested:

Unit 3 – Linear Functions - 4½ days
Pages 72 – 109

Focus: Linear Functions, graphs, and models

Core Content:

MA-H-4.2.2

Students will graph the equation of a line.

MA-H-4.3.5

Students will show how equations and graphs are models of the relationship between two real-world quantities (e.g., the relationship between degrees Celsius and degrees Fahrenheit)

MA-H-4.2.4

Students will create tables of numerical values of functions including linear, quadratic, absolute value, exponential, and simple piecewise such as some long distance phone rates.

Resources and Suggested:

Unit 4 – Systems of Linear Equations and Inequalities – 8 days
Pages 110 – 172

Focus: Solving systems of equations using graphs, algebra, and matrices.

Core Content:

MA-H-1.1.3

Students will understand how matrices are used to represent real-world data.

MA-H-1.2.3

Students will use matrix addition, subtraction, multiplication (no larger than 2 by 2), and scalar multiplication to solve real-world problems.

MA-H-4.1.3

Students will understand systems of linear equations (2 equations in 2 variables) and representations of linear systems.

Resources and Suggested: Omit 4.4 and 4.8, Competency Assurance task – Camels and Hippos

Unit 5 – Quadratic Functions and Complex Numbers - 7½ days
Pages 173 – 227

Focus: Graphing and solving quadratics

Core Content:

MA-H-4.1.4

Students will identify linear, quadratic, absolute value, and exponential functions from graphs and equations.

MA-H-4.2.6

Students will determine approximate solutions to quadratic equations

MA-H-4.3.2

Students will understand how formulas, tables, graphs, and equations of functions relate to each other.

Resources and Suggested: omit 5.7

Unit 6 - Exponential and Logarithmic Functions - 9½ days
Pages 228 – 321

Focus: The algebra of exponential and logarithmic functions

Core Content:

MA-H-1.2.1

Students will perform addition, subtraction, multiplication, and division with real numbers in problem-solving situations to specified accuracy.

MA-H-1.2.2

Students will simplify real number expressions such as those containing opposites, reciprocals, absolute values, exponents (integer), roots (square, cube), and factorials.

MA-H-4.1.6

Students will recognize, give examples of, and apply the laws of exponents.

Resources and Suggested: Divide chapter 6 into two parts with two tests : 6.1 – 6.6, then 6.8,6.9,6.10, 6.12, and 6.14.

Advanced Algebra II

Semester Two: 40 days of core content, 42 days

Unit 7 - Rational Algebraic Functions - 13 days

Pages 322 - 411

Focus: The algebra and the graphing of rational functions

Core Content:

MA-H-4.2.7

Students will add, subtract, and multiply polynomial expressions, and students will factor polynomial expressions using the greatest common monomial factor.

MA-H-4.2.8

Students will use direct and inverse variation to solve real-world problems.

Resources and Suggested: Divide chapter 7 into two parts with two tests : 7.3 – 7.8 and 7.1,7.2, 7.9 – 7.12. supplement Synthetic Division between 7.5 and 7.6.

Unit 8 - Irrational Algebraic Functions - 5 days

Pages 412 - 459

Focus: The algebra of radicals

Core Content:

MA-H-4.2.6

Students will determine approximate solutions to quadratic equations.

MA-H-4.2.8

Students will use direct and inverse variation to solve real-world problems.

Resources and Suggested:

Unit 9 - Probability and Data Analysis - 6½ days
Pages 631-699

Focus: Probability and Statistics

Core Content:

MA-H-3.1.4

Students will understand the differences between combinations and permutations.

MA-H-3.1.5

Students will understand differences between theoretical and experimental probability.

Resources and Suggested: 12.1 – 12.6, 12.9, Competency Assurance Task – Shaq’s Shoe Size

Unit 10 - Quadratic Relations and Systems - 7½ days
Pages 460 - 512

Focus: Conic Sections

Core Content:

MA-H-4.1.4

Students will identify linear, quadratic, absolute value, and exponential functions from graphs and equations.

Resources and Suggested: omit 9.6 and 9.7. Competency Assurance task – Graphing Pictures with conics.

Unit 11 - Higher Degree Functions and Complex Numbers - 4½ days
Pages 513-558

Focus: Higher degree functions and their solutions

Core Content:

MA-H-4.3.2

Students will understand how formulas, tables, graphs, and equations of functions relate to each.

Resources and Suggested:

Unit 12 - Sequences and Series - 3½ days
Pages 228 – 321

Focus: The algebra of exponential and logarithmic functions

Core Content:

MA-H-1.1.2

Students will recognize, define, give examples of, and apply to both real-world and mathematical situations finite arithmetic and geometric sequences and series.

MA-H-1.2.4

Students will determine a specific term of a sequence given an explicit formula and write an explicit rule for the nth term of arithmetic and geometric sequences.

Resources and Suggested: Extend with Pascal's Triangle and the Binomial Theorem