



2016 - 2017 Curriculum Catalog  
Algebra II

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## Algebra II Course Overview

Algebra II is a full-year, high school math course intended for the student who has successfully completed the prerequisite course Algebra I. This course focuses on algebraic techniques and methods in order to develop student understanding of advanced number theory, concepts involving linear, quadratic and polynomial functions, and pre-calculus theories. This course also integrates geometric concepts and skills throughout the units, as well as introducing students to basic trigonometric identities and problem solving.

By the end of the course, students will be expected to do the following:

- Understand set notation and the structure of mathematical systems.
- Know how to use functional notation and operations on functions.
- Simplify and solve algebraic fractions.
- Perform operations on polynomials, including factoring, long division, and synthetic division.
- Solve algebraic word problems involving mixtures, money, integers, and work.
- Evaluate and solve radical expressions and equations.
- Solve systems of equations with graphing, substitution, and matrices.
- Graph and solve quadratic equations, including conic sections.
- Graph and solve exponential and logarithmic equations.
- Calculate permutations, combinations, and complex probabilities.

Unit 1: Set, Structure, and Function		
Assignments		
Algebra II	1. Course Overview	13. Algebraic Expressions: Exponents Part 2
	2. Properties of Sets	14. Algebraic Expressions: Multiplication and Division Part 1
	3. Operations of Sets	15. Algebraic Expressions: Multiplication and Division Part 2
	4. Quiz 1: Set Theory	16. Exponents of Exponential Expressions
	5. Structure: Axioms	17. Algebraic Expressions: Combining Terms
	6. Structure: Applications	18. Quiz 3: Algebraic Expressions
	7. Relations and Functions: Definitions	19. Special Project*
	8. Relations and Functions: Graphs	20. Test
	9. Relations and Functions: Function Notation	21. Alternate Test*
	10. Relations and Functions: Inverses	22. Glossary and Credits
	11. Quiz 2: Relations and Functions	
	12. Algebraic Expressions: Exponents Part 1	

Unit 2: Numbers, Sentences, and Problems		
Assignments		
Algebra II	1. Number Order and Absolute Value	11. Compound Sentences
	2. Sums and Products	12. Quiz 2: Equalities and Inequalities
	3. Quiz 1: Numbers	13. Number Problems
	4. Solving Equations	14. Motion Problems
	5. Multiplication Property	15. Miscellaneous Problems
	6. Multi-step Equations	16. Quiz 3: Problems
	7. Equations with Parentheses	17. Special Project*
	8. Literal Expressions	18. Test
	9. Solving Inequalities	19. Alternate Test*
	10. Graphing Solution Sets for Inequalities	20. Glossary and Credits

Unit 3: Linear Equations and Inequalities		
Assignments		
Algebra II	1. Line Graphs	12. Solutions by Addition
	2. Line Graphs by Two Points	13. Solutions by Substitution
	3. Slope of Lines Part 1	14. Application of Systems of Equations
	4. Slope of Lines Part 2	15. Quiz 2: Solutions for Systems
	5. Equations: Point Slope Part 1	16. Solving Inequalities
	6. Equations: Point Slope Part 2	17. Solving Two-order Inequalities
	7. Equations: Point Slope Part 3	18. Quiz 3: Solving Inequalities
	8. Equations: Slope-Intercept	19. Special Project*
	9. General Equation of a Line	20. Test
	10. Quiz 1: Lines	21. Alternate Test*
	11. Solutions for Systems of Equations	22. Glossary and Credits

  

Unit 4: Polynomials		
Assignments		
Algebra II	1. Products and Factoring	12. Quiz 2: Polynomials
	2. Multiplying Polynomials by Polynomials	13. Direct Variation
	3. Using Special Products Part 1	14. Inverse Variation
	4. Using Special Products Part 2	15. Joint and Combined Variation
	5. Factoring Trinomials	16. Quiz 3: Working Variations
	6. Factoring Special Products Part 1	17. Project: Creating an Algorithm
	7. Factoring Special Products Part 2	18. Special Project*
	8. Quiz 1: Special Products	19. Test
	9. Addition and Subtraction Operations	20. Alternate Test*
	10. Division with Polynomials	21. Glossary and Credits
	11. Synthetic Division	

  

Unit 5: Algebraic Fractions		
Assignments		
Algebra II	1. Multiplying and Dividing with Fractions	12. Proportions
	2. Reducing Rational Expressions	13. Quiz 3: Fractional Equations
	3. Multiplying Algebraic Fractions	14. Applications of Fractions
	4. Dividing Algebraic Fractions	15. Mixture Problems
	5. Quiz 1: Algebraic Fractions	16. Work Problems
	6. Adding and Subtracting Algebraic Fractions	17. Quiz 4: Problems with Fractions
	7. Addition and Subtraction	18. Special Project*
	8. Mixed Expressions and Complex Fractions	19. Test
	9. Quiz 2: Addition and Subtraction of Fractions	20. Alternate Test*
	10. Equations with Fractions	21. Glossary and Credits
	11. Fractional Equations	

  

Unit 6: Semester Review and Exam		
Assignments		
Alg. II	1. Review	3. Alternate Exam - Form A*
	2. Exam	4. Alternate Exam - Form B*

Unit 7: Real Numbers		
Assignments		
Algebra II	1. Real Numbers	11. Word Problems Involving Quadratic Equations
	2. Law of Radicals	12. Sum and Product of Roots
	3. Conjugates	13. The Discriminant
	4. Radical Equations	14. Imaginary Numbers
	5. Quiz 1: Real Numbers	15. Quiz 3: Quadratic Formula
	6. Quadratic Equations	16. Special Project*
	7. Factoring Quadratic Equations	17. Test
	8. Completing the Square	18. Alternate Test*
	9. Quiz 2: Quadratic Solutions	19. Glossary and Credits
	10. Quadratic Formula	

Unit 8: Quadratic Relations and Systems		
Assignment Titles		
Algebra II	1. Distance Formula	12. Systems of Equations
	2. Circle	13. Solutions of Inequalities
	3. Ellipse	14. Applications of Conic Sections: Part 1
	4. Ellipse Continued	15. Applications of Conic Sections: Part 2
	5. Quiz 1: Conics and the Coordinate Plane	16. Applications of Conic Sections: Part 3
	6. Conic Sections: Parabola	17. Constant of Proportionality
	7. Conic Sections: Parabola Continued	18. Quiz 3: Applications of Conics
	8. Conic Sections: Hyperbola	19. Special Project*
	9. Conic Sections: Hyperbola Continued	20. Test
	10. Identifying Conic Sections	21. Alternate Test*
	11. Quiz 2: Conics	22. Glossary and Credits

Unit 9: Exponential Functions		
Assignment Titles		
Algebra II	1. Exponential Functions	13. Graphs of Logarithmic Functions
	2. Fractional Exponents	14. Solving Logarithmic Equations
	3. Exponential Equations	15. Logarithmic Applications
	4. Graphing Exponential Functions	16. Quiz 2: Logarithmic Functions
	5. Exponential Applications	17. Matrices
	6. Quiz 1: Exponential Functions	18. System Solutions with Matrices
	7. Logarithmic Functions	19. Addition and Multiplication of Matrices
	8. Evaluation of Logarithms	20. Quiz 3: Matrices
	9. Evaluating Exponential Functions, Common Logarithms, and Natural Logarithms	21. Special Project*
	10. General Properties of Logarithms	22. Test
	11. Scientific Notation	23. Alternate Test*
	12. Calculation of Common Logarithms	24. Glossary and Credits

Unit 10: Counting Principles		
Assignment Titles		
Algebra II	1. Progressions: Sequences	11. Quiz 3: Combinations
	2. Progressions: Series	12. Probability: Concepts
	3. Quiz 1: Sequences and Series	13. Probability: Equally Likely Outcomes
	4. Permutations: Factorials	14. Probability: Multiplication Principle
	5. Permutation Formula	15. Conditional Probability
	6. Permutations: Applications	16. Quiz 4: Probability
	7. Quiz 2: Permutations	17. Special Project*
	8. Combination Formula	18. Test
	9. Combinations: Applications	19. Alternate Test*
	10. Combinations: Binomial Coefficients	20. Glossary and Credits

Unit 11: Review		
Assignment Titles		
Algebra II	1. Integers	14. Real Numbers Continued
	2. Integers Continued	15. Quiz 2: Review
	3. Open Sentences	16. Quadratic Relations and Systems
	4. Open Sentences Continued	17. Quadratics Continued
	5. Graphs	18. Exponential Functions
	6. Graphs Continued	19. Exponential Functions Continued
	7. Quiz 1: Review	20. Counting Principles
	8. Polynomials	21. Counting Principles Continued
	9. Polynomials Continued	22. Quiz 3: Review
	10. Algebraic Fractions Part 1	23. Special Project*
	11. Algebraic Fractions Part 2	24. Test
	12. Algebraic Fractions Part 3	25. Alternate Test*
	13. Real Numbers	26. Glossary and Credits

Unit 12: Semester Review and Exam		
Assignments		
Alg. II	1. Review	3. Alternate Exam - Form A*
	2. Exam	4. Alternate Exam - Form B*

Unit 13: Final Exam		
Assignments		
Alg. II	1. Exam	3. Alternate Exam - Form B*
	2. Alternate Exam - Form A*	

(\*) Indicates alternative assignment