

## COURSE OVERVIEW

Algebra I is a full year, high school credit course that is intended for the student who has successfully mastered the core algebraic concepts covered in the prerequisite course, Pre-Algebra. Within the Algebra I course, the student will explore basic algebraic fundamentals such as evaluating, creating, solving and graphing linear, quadratic, and polynomial functions.

Upon successfully completing the course, the student should have mastered the following concepts:

- Solve single variable, absolute value, and linear systems of equations.
- Solve and graph single variable, absolute value, and linear inequalities.
- Evaluate, solve, and graph linear and quadratic functions as well as conceptualize the relationship between the independent and dependent variable of a function.
- Understand and know how to apply the distance, midpoint, and slope formulas as well as the Pythagorean theorem.
- Form an equation of a line using the slope-intercept, point-slope and standard forms of a line.
- Organize data in the form of a table or matrix; perform complex matrix operations such as multiplication, evaluating the determinant, and solving a system of linear equations using Cramer's Rule.
- Apply basic fundamental rules of exponents.
- Be able to construct a formula or equation necessary to solve algebraic word problems involving area, perimeter, and linear systems of equations, basic probability and statistical reasoning, distance, and compounding interest.
- Evaluate rational expressions and solve equations with rational expressions.
- Simplify and perform operations with radical expressions and polynomials.

UNIT 1: FOUNDATIONS OF ALGEBRA	
ALGEBRA I	<b>Assignment Titles</b>
	1. Course Overview
	2. Variables and Expressions
	3. Exponents and Order of Operations
	4. Evaluating Expressions
	5. Quiz 1: The Language of Algebra
	6. Classifying and Comparing Numbers
	7. Decimal-Fraction Conversions
	8. Fractions
	9. Adding and Subtracting Signed Numbers
	10. Multiplying and Dividing Signed Numbers
11. Absolute Value	
12. Quiz 2: The Real Numbers	
13. Commutative and Associative Properties	
14. Distributive Property	
15. Simplifying Expressions	
16. Quiz 3: Properties of the Real Numbers	
17. Special Project*	
18. Review	
19. Test	
20. Alternate Test*	
21. Glossary and Credits	

UNIT 2: LINEAR EQUATIONS	
ALGEBRA I	<b>Assignment Titles</b>
	1. Open Sentences
	2. Addition Property of Equality
	3. Multiplication Property of Equality
	4. Two-Step Equations
	5. Quiz 1: Solving Equations
	6. Variables on Both Sides
	7. Combining Like Terms
	8. The Distributive Property
	9. Literal Equations
	10. Quiz 2: Multi-Step Equations
11. Writing Equations from Word Problems	
12. Two Unknowns	
13. More than Two Unknowns	
14. Using a Chart	
15. Quiz 3: Word Problems	
16. Percent Problems	
17. Mixture and Interest Problems	
18. Quiz 4: Mixture and Investment Problems	
19. Special Project*	
20. Review	
21. Test	
22. Alternate Test*	
23. Glossary and Credits	

## UNIT 3: FUNCTIONS

ALGEBRA I

## Assignment Titles

- |                            |                                       |
|----------------------------|---------------------------------------|
| 1. The Coordinate Plane    | 13. Absolute Value Functions          |
| 2. Identifying Functions   | 14. Quiz 3: Graphing Linear Functions |
| 3. Function Notation       | 15. Writing Linear Equations (1)      |
| 4. Modeling Functions      | 16. Writing Linear Equations (2)      |
| 5. Quiz 1: Function Basics | 17. Writing Linear Equations (3)      |
| 6. Writing a Function Rule | 18. Quiz 4: Writing Linear Equations  |
| 7. Arithmetic Sequences    | 19. Special Project                   |
| 8. Direct Variation        | 20. Review                            |
| 9. Slope                   | 21. Test                              |
| 10. Quiz 2: Patterns       | 22. Alternate Test                    |
| 11. Linear Equations       | 23. Glossary and Credits              |
| 12. Slope-Intercept Form   |                                       |

## UNIT 4: INEQUALITIES

ALGEBRA I

## Assignment Titles

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|--|--|
| 1. Graphing                              | 11. Absolute Value Solution Sets                   |
| 2. Addition Property of Inequality       | 12. Absolute Value Inequalities with One Variable  |
| 3. Multiplication Property of Inequality | 13. Absolute Value Inequalities with Two Variables |
| 4. Multi-Step Inequalities               | 14. Quiz 3: Absolute Value                         |
| 5. Problem Solving                       | 15. Special Project*                               |
| 6. Quiz 1: Solving Inequalities          | 16. Review   |
| 7. Compound Inequality Graphs            | 17. Test   |
| 8. Solving Compound Inequalities         | 18. Alternate Test*                                |
| 9. Inequalities with Two Variables       | 19. Glossary and Credits                           |
| 10. Quiz 2: Compound Inequalities        |  |

## UNIT 5: LINEAR SYSTEMS

ALGEBRA I

## Assignment Titles

- |   |   |
|---|---|
| 1. Solution of a System                         | 11. Money and Unit Pricing                              |
| 2. Graphing Systems of Equations                | 12. Using Formulas                                      |
| 3. Systems of Inequalities                      | 13. Quiz 3: Representing Problems Using a Linear System |
| 4. Quiz 1: Solving Linear Systems by Graphing   |   |
| 5. Substitution Method                          | 14. Special Project*                                    |
| 6. Addition Method                              | 15. Review  |
| 7. Matrices                                     | 16. Test  |
| 8. Fractional Coefficients                      | 17. Alternate Test*                                     |
| 9. Quiz 2: Solving Linear Systems Algebraically | 18. Glossary and Credits                                |
| 10. Using Two Variables                         |   |

## UNIT 6: SEMESTER REVIEW AND EXAM

ALGEBRA I

## Assignment Titles

- |           |                             |
|-----------|-----------------------------|
| 1. Review | 3. Alternate Exam - Form A* |
| 2. Exam   | 4. Alternate Exam - Form B* |

## UNIT 7: POLYNOMIALS

ALGEBRA I

## Assignment Titles

- |   |                                   |
|---|-----------------------------------|
| 1. Adding and Subtracting Polynomials           | 12. Factoring by Grouping         |
| 2. Grouping Symbols                             | 13. Factoring Trinomials (1)      |
| 3. Quiz 1: Adding and Subtracting Polynomials   | 14. Factoring Trinomials (2)      |
| 4. Multiplying by a Monomial                    | 15. Special Cases                 |
| 5. Multiplying Polynomials                      | 16. Complete Factorization        |
| 6. F.O.I.L. and Special Cases                   | 17. Quiz 3: Factoring Polynomials |
| 7. Dividing by a Monomial                       | 18. Special Project*              |
| 8. Long Division                                | 19. Review                        |
| 9. Quiz 2: Multiplying and Dividing Polynomials | 20. Test                          |
| 10. Greatest Common Factor                      | 21. Alternate Test*               |
| 11. Factoring Out the GCF                       | 22. Glossary and Credits          |

## UNIT 8: EXPONENTIAL AND RADICAL FUNCTIONS

ALGEBRA I

## Assignment Titles

- |   |                                     |
|---|-------------------------------------|
| 1. Negative Exponents                         | 11. Multiplying Radicals            |
| 2. Exponential Expressions                    | 12. Dividing Radicals               |
| 3. Scientific Notation                        | 13. Adding and Subtracting Radicals |
| 4. Quiz 1: Evaluating Exponential Expressions | 14. Radical Equations               |
| 5. Multiplication                             | 15. Quiz 3: Radical Functions       |
| 6. Raising to a Power                         | 16. Special Project*                |
| 7. Division                                   | 17. Review                          |
| 8. Geometric Sequences                        | 18. Test                            |
| 9. Quiz 2: Properties of Exponents            | 19. Alternate Test*                 |
| 10. Simplifying Radicals                      | 20. Glossary and Credits            |

## UNIT 9: QUADRATICS

ALGEBRA I

## Assignment Titles

- |   |   |
|---|---|
| 1. Pythagorean Theorem                  | 12. Applications of Quadratics          |
| 2. Distance                             | 13. Completing the Square               |
| 3. Midpoint                             | 14. Completing the Square*              |
| 4. Quiz 1: Formulas                     | 15. Quadratic Formula (1)               |
| 5. Quadratic Functions                  | 16. Quadratic Formula (2)               |
| 6. Transformations                      | 17. Quiz 3: Solving Quadratic Equations |
| 7. Line of Symmetry                     | 18. Special Project*                    |
| 8. Quadratic Inequalities               | 19. Review                              |
| 9. Quiz 2: Graphing Quadratic Functions | 20. Test                                |
| 10. Solving by Factoring                | 21. Alternate Test*                     |
| 11. Square Root Method                  | 22. Glossary and Credits                |

## UNIT 10: RATIONAL EXPRESSIONS

ALGEBRA I

## Assignment Titles

- |  |   |
|--|---|
| 1. Simplifying Rational Expressions                | 9. Inequalities                                 |
| 2. Multiplying and Dividing Rational Expressions   | 10. Applications of Rational Equations          |
| 3. Adding and Subtracting with Like Denominators   | 11. More Problems                               |
| 4. Adding and Subtracting with Unlike Denominators | 12. Quiz 2: Rational Equations and Inequalities |
| 5. Quiz 1: Operations with Rational Expressions    | 13. Special Project*                            |
| 6. Proportions                                     | 14. Review                                      |
| 7. Using the LCD                                   | 15. Test  |
| 8. Complex Fractions                               | 16. Alternate Test*                             |
|  | 17. Glossary and Credits                        |

UNIT 11: PROBABILITY AND STATISTICS	
ALGEBRA I	<b>Assignment Titles</b>
	1. Measures of Central Tendency
	2. Dispersion
	3. Interpreting Data
	4. Project: Data Analysis
	5. Quiz 1: Measures of Central Tendency
	6. Sampling and Outcomes
	7. Permutations
	8. Combinations
	9. Quiz 2: Outcomes
	10. Probability
	11. Compound Events
	12. Project: Probability
	13. Quiz 3: Probability
	14. Special Project
	15. Review
	16. Test
	17. Alternate Test
18. Glossary and Credits	

UNIT 12: SEMESTER REVIEW AND EXAM	
ALGEBRA I	<b>Assignment Titles</b>
	1. Review
	2. Exam
	3. Alternate Exam - Form A*
	4. Alternate Exam - Form B*

UNIT 13: FINAL EXAM	
ALGEBRA I	<b>Assignment Titles</b>
	1. Exam
	2. Alternate Exam - Form A*
	3. Alternate Exam - Form B*

(\*) Indicates alternate assignment