

Algebra 1 2009-2010

Ms. Lavery

Philosophy

Welcome to Algebra 1 where we will begin our study of mathematics beyond arithmetic. Since the study of algebra is similar to the study of a new language, it is important that you listen carefully, ask questions freely, and work hard at mastering each topic before we move on. We will be spending time on each topic, doing many practice exercises, and allowing time for questions, however, if you need more time or must ask more questions, please visit me frequently for extra help. Do your best work, relax, smile, and enjoy math!

Policies and Procedures

1. There will be a test at the end of each chapter, unless the chapter is very long. In that case, there will be a test in the middle of the chapter. Tests will be announced at least 2 days prior to the testing date.
2. Unannounced quizzes may be given.
3. Homework is assigned most days and will be due the following day in class. Homework will not be graded, but the completion of the assignment will be noted. Your grade is calculated as follows:

Tests:	70%
Quizzes:	30%
4. I will be in my office daily during Academic Help and students are encouraged to attend on a regular basis.
5. You are expected to:
 - Come to class on time each day with your homework, textbook, calculator, pencil and notebook.
 - Try your best.
 - Relax and enjoy math.

Algebra 1 Timeline

**Text: Algebra Structure and Method Book 1
(Brown, Dolciani, Sorgenfrey & Cole, 2000)**

<u>Week of</u>	<u>Chapters</u>	<u>Sections</u>	<u>Topics</u>
August 26	1	All	Introduction to algebra
Sept. 1	1	All	Introduction to algebra
Sept. 8	1	All	Introduction to algebra
Sept. 15	2	All	Real numbers
Sept. 22	2	All	Real numbers
Sept. 29	3	All except 3. 8	Solving equations and problems
Oct. 6	3	All except 3.8	Solving equations and problems
Oct. 13	4	All except 4.10	Polynomials
Oct. 20	4	All except 4.10	Polynomials
Oct. 27	4	All except 4.10	Polynomials
Nov. 3	5	All	Factoring polynomials
Nov. 10		Review for trimester exam	

Nov. 17	5	All	Factoring polynomials
Dec. 1	5	All	Factoring polynomials
Dec. 8	5	All	Factoring polynomials
Dec. 15	6	All	Algebraic fractions
Jan. 6	6	All	Algebraic fractions
Jan. 12	6	All	Algebraic fractions
Jan. 19	7	All except 7.10	Applying fractions
Jan. 26	7	All except 7.10	Applying fractions
Feb. 2	7	All except 7.10	Applying fractions
Feb. 9	8	All except 8.6	Functions and lines
Feb. 16	8	All except 8.6	Functions and lines
Feb. 23	8	All except 8.6	Functions and lines
Mar. 2	8	All except 8.6	Functions and lines
Mar. 9	10	All except 10.6 & 8	Inequalities and absolute value
Mar. 16	10	All except 10.6 & 8	Inequalities and absolute value
Mar. 30	10	All except 10.6 & 8	Inequalities and absolute value
Apr. 6	11	All except 11.6	Rational and irrational numbers
Apr. 13	11	All except 11.6	Rational and irrational numbers
Apr. 20	11	All except 11.6	Rational and irrational numbers
Apr. 27	12	All except 12.7 & 8	Quadratic functions
May 4	12	All except 12.7& 8	Quadratic functions
May 11		Review	
May 19		Final exam	

Algebra 1 Outline

I. Introduction to algebra

A. Basic terminology

1. Variables

- Values of the variable
- Variable and numerical expressions
- Simplifying expressions
- Substitution Principle
- Evaluating expressions

2. Grouping symbols

- Parentheses, brackets, fraction bar
- Order of operations

- 3.. Equations
 - a. Open sentences
 - b. Domain
 - c. Solutions or roots
 - d. Satisfying an equation
- B. Applications and problem solving
 - 1. Translating words into symbols
 - 2. Translating sentences into equations
 - 3. Translating problems into equations
 - 4. Plan for solving word problems
- C. Numbers on a line
 - 1. Number lines
 - a. Origin
 - b. Natural or counting numbers
 - c. Whole numbers
 - d. Integers
 - e. Graph
 - f. Coordinates
 - g. Real numbers
 - h. Inequality symbols
 - 2. Opposites
 - 3. Absolute value

II. Working with real numbers

- A. Addition and subtraction
 - 1. Basic assumptions
 - a. Closure Properties
 - b. Commutative Properties
 - c. Associative Properties
 - d. Properties of Equality
 - e. Identity Property of Addition
 - f. Additive Inverse Property
 - g. Property of Opposite of a Sum
 - 2. Rules for addition
 - 3. Definition of subtraction
- B. Multiplication
 - 1. Basic assumptions
 - a. Distributive Property
 - b. Identity Property of Multiplication
 - c. Multiplicative Property of Zero
 - d. Multiplicative Property of -1
 - e. Property of Opposites in Products
 - 2. Rules for multiplication
 - 3. Consecutive integer problems
- C. Division
 - 1. Basic assumptions
 - a. Multiplicative Inverse Property
 - b. Property of the Reciprocal of the Opposite of a Number
 - c. Property of the Reciprocal of a Product
 - 2. Definition of division
 - 3. Rules for division

III. Solving equations and problems

- A. Transforming equations into equivalent equations
 - 1. By addition and subtraction
 - a. Addition Property of Equality
 - b. Substitution
 - 2. By multiplication and division

- a. Multiplication Property of Equality
 - b. Never multiply by zero when transforming an equation
- 3. Using several transformations
- B. Solving problems
 - 1. Using equations to solve word problems
 - 2. Equations with the variable on both sides
- C. Extending problem solving skills
 - 1. Using charts to solve word problems
 - 2. Cost, income, and value problems

IV. Polynomials

- A. Addition and subtraction
 - 1. Basic terminology
 - a. Exponent, base, power
 - b. Monomial, binomial, trinomial, polynomial
 - c. Constant
 - d. Coefficient
 - e. Similar or like terms
 - f. Simplest form
 - g. Degree
 - 2. Simplifying polynomials by adding like terms
- B. Multiplication
 - 1. Exponent Rules
 - a. Product of Powers
 - b. Power of a Power
 - c. Power of a Product
 - 2. Multiplying polynomials by monomials
 - 3. Multiplying polynomials
- C. Problem solving
 - 1. Transforming formulas
 - 2. Distance-rate-time problems
 - 3. Area problems

V. Factoring Polynomials

- A. Quotients and factoring
 - 1. Factoring integers
 - a. Prime factorization
 - b. Greatest common factor
 - 2. Dividing monomials
 - a. Property of Quotients
 - b. Exponent Rule for Division
 - c. Negative and zero exponents
 - 3. Monomial factors of polynomials
- B. Products and factors
 - 1. Multiplying binomials mentally (FOIL method)
 - 2. Difference of two squares
 - 3. Perfect square trinomials
 - 4. Factoring trinomials with a leading coefficient of one
 - 5. Factoring by grouping
 - 6. Factoring trinomials with a leading coefficient other than one
 - 7. Using several methods to factor completely
- C. Applications
 - 1. Solving equations by factoring
 - a. Zero-Product Property
 - b. Double roots
 - 2. Solving word problems by factoring

VI. Algebraic fractions

- A. Simplifying algebraic fractions
- B. Multiplying algebraic fractions
 - 1. Multiplication Rule for Fractions
 - 2. Exponent Rule: Power of a Quotient
- C. Dividing algebraic fractions
- D. Adding and subtracting algebraic fractions
 - 1. Least common denominators
 - 2. Addition Rule for Fractions
- E. Polynomial division
 - 1. Mixed expressions
 - 2. Polynomial long division

VII. Applying fractions

- A. Ratios
- B. Proportions
- C. Equations with fractional coefficients
- D. Fractional equations (equations with a variable in the denominator)
- E. Percents
 - 1. Translating three types of percent problems into equations
 - 2. Percent of increase or decrease problems
 - 3. Interest problems
- F. Mixture problems
- G. Work problems
- H. Summary of rules of exponents

VIII. Functions and lines

- A. Equations in two variables
- B. Basic vocabulary
- C. Slope of a line
 - 1. Definition
 - 2. Slope of straight line - constant
 - 3. Slope of horizontal line - 0
 - 4. Vertical line - no slope
- D. Forms of a linear equation
 - 1. Standard
 - 2. Slope-intercept
 - 3. Point-slope
- E. Graphing linear equations
 - 1. By finding x - and y -intercepts (using standard form)
 - 2. By finding y -intercept and counting slope (using slope-intercept form)
- G. Parallel and perpendicular lines
- H. Determining an equation of a line
 - 1. Given the graph
 - 2. Given the slope and one point on the line
 - 3. Given two points on the line
- I. Functions
 - 1. Domain and range
 - 2. Notation
 - 3. Linear
 - 4. Quadratic
 - a. Minimum and maximum
 - b. Vertex
 - c. Axis of symmetry
 - d. Parabola
- J. Relations
- K. Variation
 - 1. Direct

- a. $y = kx$, where k is a nonzero constant
 - b. Constant of variation; constant of proportionality
 - c. Graph – line through origin
2. Inverse
- a. $y = k/x$ where x is not zero
 - b. Constant of variation
 - c. Graph – hyperbola

IX. Inequalities

- A. Inequalities in one variable
 - 1. Order of real numbers
 - 2. Graphing on a number line
 - 3. Solving inequalities
 - a. Property of Comparison
 - b. Transitive Property of Order
 - c. Addition Property of Order
 - d. Multiplication Property of Order
 - e. Transformations that produce equivalent inequalities
 - 4. Word problems
- B. Sets
 - 1. Venn diagrams
 - 2. Intersection
 - 3. Union
 - 4. Null, or empty, set
- C. Solving combined inequalities
 - 1. Conjunction
 - 2. Disjunction
- D. Absolute value in open sentences
 - 1. Solving absolute value equations in one variable
 - 2. Graphing solution set on a number line
- E. Graphing linear inequalities
- F. Graphing absolute value equations in two variables

X. Rational and irrational numbers

- A. Rational numbers
 - 1. Definition
 - 2. Density Property for Rational Numbers
 - 3. Decimal forms
 - 4. Rational square roots
 - a. Principal root
 - b. Radicand
 - c. Product Property of Square Roots
 - d. Quotient Property of Square Roots
- B. Irrational numbers
 - 1. Irrational square roots
 - 2. Property of Completeness
- C. Square roots of variable expressions
- D. Radical expressions
 - 1. Multiplying
 - 2. Dividing
 - 3. Simplifying
 - 4. Rationalizing the denominator
 - 5. Adding
 - 6. Subtracting
- E. Multiplication of binomials containing radicals
- F. Simple radical equations

XI. Quadratic functions

- A. Quadratic equations with perfect squares
- B. Completing the square
- C. The quadratic formula
- D. Graphs of quadratic equations
 - a. Roots
 - b. Discriminant
- E. Methods for solving a quadratic equation
- F. Word problems

MATH IS FUN