

Algebra I Syllabus - Protégé

Text

Required:

Foerster Algebra I Classics Edition (2006) by Paul A. Foerster, published by Prentice Hall
ISBN-13: 978-0131657083 ISBN-10: 0131657089

[CK-12 Basic Algebra Concepts](#) by CK-12.org

Recommended: Home Study Companion *Algebra I* from [Math Without Borders](#) (videos to accompany each lesson in text)

Course Overview:

This course is designed to present the normal content of first year high school algebra, preparing students for a subsequent course in either geometry or second year algebra. The unifying theme of the course is the expression. Students will learn to write expressions, find the value of expressions when the variable is known, and find the variable when the value of the expression is known. The first part of the year is sequenced to lead to the Quadratic Formula, beginning with these topics: expressions and equations, operations with negative numbers, axioms and properties, and factoring polynomials. The second half of the year focuses on solving equations with two variables, properties of exponents, rational and radical algebraic expressions, and inequalities. Students will develop the comprehensive understanding of linear and quadratic functions. They will understand the relationship between equations, graphs and solutions to equations. Students will apply their algebraic reasoning and problem solving skills to real world problems throughout the course. They will be able to justify their answers, demonstrating an understanding of the mathematic reasoning behind their solutions.

Pre-requisites:

Students should have all the prerequisite skills for Pre-Algebra (mastered their basic math facts up to 12's, is able to multiply and divide with three digit numbers as well as fractions and decimals, and competently add, subtract, multiply and divide with negative numbers). In addition, they need to have received an A (scored 90% or higher on assignments or final test) in Mastering Math Essentials, or a comparable course, and have demonstrated both an affinity for math and a faculty for it. Alternately, they can have completed Pre-Algebra with a C (75% or higher) or higher.

Class Schedule:

Each week will cover 3-5 sub-lessons in the textbook. Students will be expected to spend between 45 and 60 minutes each day on Algebra in addition to class time. Class time will be used to introduce the more difficult concepts, answer questions from homework, solve more difficult problems, and take quizzes to check for understanding. Each chapter contains new vocabulary and it will be expected that students use new vocabulary in class and can define them on quizzes.

There will be weekly quizzes about concepts learned the previous week. Each chapter will contain a chapter test.

Student Expectations:

Students will be expected to study the textbook and examples at home as well as to complete the exercises for each lesson. They will complete the odd numbered problems for each lesson and will check their answers against the answer key at the back of the book and correct any errors. Students are to keep an up-to-date record of their homework and test scores in their course binder so that their parents and HQT can see at a glance how they are progressing.

Class Helps:

Assignments may be supplemented with videos from Kahn Academy and math.com

Suggested Grading:

Chapter Tests: 30%

Quizzes: 30%

Homework: 20%

End of Semester Tests: 20%

Lesson 1 Expressions and Equations

Operations with Numbers

Variables

Powers and Exponents

Order of Operations

Expressions from Word Statements

Introduction to Equations

Solving Equations

Problems that Lead to Equations

Problems that Lead to Expressions and Equations

Chapter Review and Test

Lesson 2 Operations with Negative Numbers

Introduction to Negative Numbers

Adding Signed Numbers

Subtracting Signed Numbers

Multiplying Signed Numbers

Dividing Signed Numbers

Commuting and Associating

Equations that need Two Transformations

Problems that Lead to Two Transformation Equations

Chapter Review and Test

Lesson 3 Distributing: Axioms and Other Properties

Distributing

Distributing Multiplication over Subtraction

More Distributive Properties

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Like Terms and Common Factors
Axioms for Adding and Multiplying
Properties of Equality
Chapter Review and Test

Lesson 4 Harder Equations

Equations with Like Terms
Equations with Like Terms and Distributing
Equations with Variables in Both Members
Equations that Involve Decimals
Literal Equations and Formulas
Problems that Involve More than One Expression
Chapter Review and Test

Lesson 5 Some Operations with Polynomials and Radicals

Introduction to Polynomials
Names of Polynomials
Product of Two Binomials
Factoring Quadratic Trinomials
Factoring Quadratic Trinomials - Third Term Negative
Factoring Quadratic Trinomials - First Coefficient Not 1
Factoring a Difference Between Two Squares
Squaring a Binomial
Factoring Trinomial Squares
Radicals, Irrational Numbers, and the Closure Axioms
Chapter Review and Test

Lesson 6 Quadratic Equations

Introduction to the Quadratic Formula
Evaluating Radical Expressions
Equations Containing Absolute Value
Equations with Squares
Equations with Trinomial Squares
Completing the Square
Solving Quadratic Equations by Completing the Square
The Quadratic Formula
Vertical Motion Problems
The Discriminant
Chapter Review and Test
Cumulative Review and Test (Midterm)

Lesson 7 Expressions Containing Two Variables

Evaluating Expressions Containing Two Variables
The Cartesian Coordinate System
Graphs of Equations Containing Two Variables

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Intercepts and Rapid Graphing
Slope and Rapid Graphing
Finding an Equation from the Graph
Finding the Intersection of Two Graphs by Accurate Plotting
Solving Systems of Equations by Substitution
Solving Systems of Equations using the Linear Combination Method
Problems Involving Two Variables
Chapter Review and Test

Lesson 8 (Chapter 9 in text) Properties of Exponents

Prime Numbers and Prime Factors
The Operation Exponentiation
Exponents, Products, and Powers
Exponents and Quotients
Negative and Zero Exponents
Powers of 10 and Scientific Notation
Problems Involving Numbers in Scientific Notation
Chapter Review and Test

Lesson 9 (Chapter 10 in text) More Operations with Polynomials

Review of Multiplying and Factoring Polynomials
The Greatest Common Factor
Factoring Polynomials That Have Common Factors
Common Binomial Factors
Factoring by Grouping (Associating)
Factoring Harder Quadratic Trinomials (Splitting the middle term)
Solving Quadratic Equations by Factoring
Chapter Review and Test

Lesson 10 (Chapter 13 in text) Inequalities

Number Line Graphs
Solving Inequalities
Compound Inequalities
Inequalities Containing Absolute Value
Inequalities: Given x , Evaluate the Expression
Linear Inequalities with Two Variables
Systems of Equations and Inequalities
Chapter Review and Test

Lesson 11 More Operations with Polynomials

Introduction to Rational Algebraic Expressions and Equations
Simplifying Rational Algebraic Expressions
Multiplying and Dividing Rational Expressions
Least Common Multiple
Adding and Subtracting Rational Expressions
Problems Involving Ratio and Proportion

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Problems Involving Probability and other Rational Expressions
Chapter Review and Test

Lesson 12 Radical Algebraic Expressions

Introduction to Radical Algebraic Expressions

Sums, Differences and Products of Radicals

Quotients of Radicals

Binomials with Radicals

Square Roots of Variable Expressions

Radical Equations

The Pythagorean Theorem and Applications

Higher Order Radicals

Rational and Irrational Numbers

Chapter Review and Test