

Syllabus and Course outline

Algebra 1

Course Description

Algebra 1 is the critical element in secondary mathematics education. Topics introduced in Algebra 1 provide the foundation students require for future success in high school mathematics, critical thinking, and problem solving. The primary goal in Algebra 1 is to help students transfer their concrete mathematical knowledge to more Algebra abstract algebraic generalizations.

Course Objectives

The student will be able to:

- Apply and demonstrate the different way numbers are represented and used in the real world
- Determine the effects of operations on numbers and the relationships among these operations
- Select appropriate operations, and compute for problem solving
- Write and solve single and multi-step equations including real-world applications
- Explain how rates and ratios are similar or different
- Use rates and ratios to model and solve real-life problems
- Articulate under what conditions a relation is a function
- Describe, analyze, and generalize a wide variety of patterns, relations, and functions
- Display representations of a functions (equations, graphs, and tables)
- Connect representations of a function in a real world context and communicate mathematical thinking
- Solve systems of equations using various methods
- Use inequalities in an applied application to solve/evaluate real world data
- Identify, graph and analyze an exponential growth and decay function
- Apply various types of factoring methods to solve real-world problems
- Graph, analyze and solve quadratic equations
- Explain the concept of radical functions as applied to Geometry

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- Explain the concept of rational functions as applied to specific real-world situations
- Find probabilities of simple and compound events
- Analyze, create, display and interpret data using statistical methods

Prerequisite

Pre-Algebra

Topic:

- 1: An Introduction to the Course
- 2: Order of Operations
- 3: Percents, Decimals, and Fractions
- 4: Variables and Algebraic Expressions
- 5: Operations and Expressions
- 6: Principles of Graphing in 2 Dimensions
- 7: Solving Linear Equations
- 8: Slope of a Line
- 9: Graphing Linear Equations
- 10: Parallel and Perpendicular Lines
- 11: Solving Word Problems with Linear Equations
- 12: Systems of Linear Equations
- 13: Linear Inequalities
- 14: An Introduction to Quadratic Polynomials
- 15: Factoring Trinomials
- 16: Quadratic Equations-Factoring

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- 17: Quadratic Equations-The Quadratic Formula
- 18: Quadratic Equations-Completing the Square
- 19: Representations of Quadratic Functions
- 20: Quadratic Equations in the Real World
- 21: The Pythagorean Theorem
- 22: Polynomials of Higher Degree
- 23: Operations and Polynomials
- 24: Rational Expressions
- 25: Graphing Rational Functions
- 26: Radical Expressions
- 27: Solving Radical Equations
- 28: Graphing Radical Functions
- 29: Sequences and Pattern Recognition