

ALGEBRA I PART 1

Prerequisite: A grade of C or better in the last previous math course is recommended

Meeting time: 5 days a week, full-year, one credit

Placement: Grades 9, 10, 11, Level III

This is the first half of a two-year sequence. The topics covered in Algebra I, Part I comprise one-half of the units covered in Algebra I. The student must complete Algebra I Part I and Algebra I Part II to obtain credits to enter the next sequential college preparatory course, Geometry. Topics covered will include variables, equations and inequalities, polynomials, formulas, and word problem applications. The basic concepts of arithmetic will be applied in these units to the terminology of algebra.

COURSE GOALS AND OBJECTIVES

1. To strengthen the student's fundamental skills and concepts previously learned.
2. To have the student acquire facility in applying algebraic concepts and skills.
3. To have the student learn the meaning of the types of open sentences and be able to determine the solution sets for first degree and some special forms of second-degree open sentences.
4. To develop for the student a procedure for understanding and solving application problems related to real-world scenarios.
5. To develop the student's appreciation for estimation and awareness of when precision is needed in mathematical language and symbolism.
6. To give the student a basic understanding of the connection and interrelations between Algebra and Geometry.
7. To bring the student an understanding of the logical evolution of the real number system, and to have the student realize that this system developed as a result of a need for numbers with particular properties.

ALGEBRA I, PART I

(Agawam High School Academic Expectations: 1,2,3,4,5)

Strand 1: Number Sense and Operations

NCTM Standard (State Standard)

- Collect and organize data using charts, tables, and graphs. (AI.D.1)
- Interpret, analyze charts, tables, and graphs. (AI.D.1)
- Find mean, median, and mode of sets of data. (AI.D.1)
- Classify real numbers as natural, whole, integer, rational, or irrational numbers. (AI.N.1)
- Compare and contrast sets of real numbers. (AI.N.1)
- Apply the properties of real numbers. (AI.N.1)
- Identify rational numbers. (AI.N.1)
- Compare and order rational numbers on the number line. (AI.N.1)

- Perform the four arithmetic operations with rational numbers. (AI.N.1)
- Interpret real-world scenarios involving rational numbers. (AI.N.4 and AI.P.11)
- Identify irrational numbers. (AI.N.1)
- Order irrational numbers. (AI.N.1)
- Perform four arithmetic operations with irrational numbers. (AI.N.1)
- Evaluate expressions using order of operations. (AI.N.2)
- Apply technology to discrete mathematics and mathematical structure. (AI.P.11)
- Estimate solutions. (AI.N.4)
- Check reasonableness of answer in problem solving. (AI.N.4)
- Use estimation in analyzing data. (AI.N.4 and AI.D.1 and AI.D.2)
- Compare estimation with and without technologically generated approximation. (AI.N.3 and AI.N.4)

Strand 2: Patterns, Relations, and Algebra

NCTM Standard (State Standard)

- Comprehend the concepts of variable, expression, and equation. (AI.P.1)
- Identify and perform operations in solving one variable equations and inequalities. (AI.P.2)
- Interpret and solve equations, inequalities, and equations that involve absolute value. (AI.P.2 and AI.P.10)
- Develop and write equations or inequalities based on word problems. (AI.P.11)
- Use equations to solve real-world problems and interpret the results. (AI.P.11 and AI.P.12)
- Use properties to transform formulas, equations, and inequalities. (AI.P.8)
- Identify, apply, and analyze steps to solve a system of equations. (AI.P.12)
- Perform operations with monomials. (AI.P.7)
- Graph coordinate points, linear equations, equations with absolute value and inequalities. (AI.P.5 and AI.P.10)
- Define relations, functions, domain, and range. (AI.P.3)
- Identify families of functions for equations and graphs. (AI.P.4)
- Evaluate functions. (AI.P.3)
- Write rules for functions from tables and real-world situations. (AI.P.4 and AI.P.11)
- Analyze and interpret the graphs of linear functions. (AI.P.1)
- Graph systems of functions. (AI.P.12)
- Utilize technology to aid in the analysis of functions, and to situations involving algebra. (AI.P.11 and AI.P.12)

Strand 3: Geometry

NCTM Standard (State Standard)

- Solve problem situations with geometric properties. (G.G.5)
- Analyze and connect properties of geometric shapes to real-world scenarios. (G.M.1)

- Formulate and apply geometric analysis of slope. (G.G.11 and G.G.12)
- Use algebraic equations to solve realistic, geometric situations. (A1.P.2)
- Apply technology to geometry from an algebraic, geometric, and spatial perspective. (G.G.4)

Strand 4: Measurement

NCTM Standard (State Standard)

- Calculate perimeter, circumference, and area of common geometric figures. (G.M.1)

Strand 5: Data Analysis, Statistics and Probability

NCTM Standard (State Standard)

- Draw inferences, summarize, and communicate from both data collected and data representations. (A1.D.1)
- Use sampling from real-world situations in statistical experiments. (A1.D.3)
- Determine ratios and percents of outcomes. (A1.D.3)
- Use and apply theoretical probabilities to determine outcomes. (A1.D.3)
- Conduct experimental probabilities. (A1.D.3)
- Use equations to solve problems involving percents. (A1.D.4)
- Use proportions and percents to solve real-world problems. (A1.P.4)
- Apply technology to the study of probability and in the evaluation of statistical data. (A1.D.2)

RESOURCES

Bellman, Allan et al. Algebra I, Upper Saddle River, New Jersey; Prentice-Hall, Inc., 2004.

Teacher generated materials such as NCTM journals, note taking outlines, etc.

Technology Resources: Classroom sets of scientific and graphing calculators.

ASSESSMENT STRATEGIES

- Class participation, written and oral communication
- Class work
- Homework
- Class projects and presentations
- Notebooks/Portfolios
- Quizzes
- Tests
- Semester Exams
- School Wide and Departmental Rubrics