

ALGEBRA I HONORS

Prerequisite: A grade of 85 or better in Pre-Algebra and teacher recommendation

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

Placement: Grade 9, Level II

ALGEBRA I-9

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

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

Placement: Grade 9, Level III

Algebra I stresses the concepts and terminology of elementary algebra while clarifying, simplifying and broadening the basic ideas of mathematics. The course provides a solid foundation for the operations and procedures of algebra while reinforcing the fundamental properties of addition and multiplication. Deductive reasoning is woven into the presentation of the course to emphasize the development of communication skills for the interpretation of algebraic application to real-world scenarios. The use of technology (i.e., scientific and graphing calculators, computers) will be utilized to develop conceptual understanding.

To build upon the unifying themes they were exposed to in their grade eight math course, grade nine students are encouraged to enroll in Algebra I-9. Algebra in grade eight offered at Agawam Junior High School is equivalent to Algebra I Honors as described.

Algebra I Honors extends the topics presented in Algebra I and introduces additional concepts. These concepts are unique to Algebra I Honors and are identified by an asterisk (*).

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 HONORS

ALGEBRA I-9

(Agawam High School Academic Expectations: 1,2,3,4,5,*6)

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)
- 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 multiplication and division properties of integer exponents. (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, AI.D.1, and AI.D.2)
- Compare estimation with and without technologically generated approximation. (AI.N.3 and AI.N.4)
- * Add and subtract rational expressions with like and unlike denominators. (AI.N.1 and AI.P.8)

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. (A.I.P.11)
- Use equations to solve real-world problems and interpret the results. (A.I.P.11 and A.I.P.12)
- Use properties to transform formulas, equations, and inequalities. (A.I.P.8)
- Identify, apply, and analyze steps to solve a system of equations. (A.I.P.12)
- Perform operations with monomials, binomials, trinomials, and other polynomials. (A.I.P.7)
- Graph coordinate points, linear equations, equations with absolute value and inequalities. (A.I.P.5 and A.I.P.10)
- Identify and solve quadratic equations. (A.I.P.9)
- Define relations, functions, domain, and range. (A.I.P.3)
- Identify families of functions for equations and graphs. (A.I.P.4)
- Evaluate functions. (A.I.P.3)
- Write rules for functions from tables and real-world situations. (A.I.P.4 and A.I.P.11)
- Identify and analyze patterns in exponential functions. (A.I.P.1)
- Analyze and interpret the graphs of linear and quadratic functions. (A.I.P.1)
- Graph systems of functions. (A.I.P.12)
- * Identify, interpret, and analyze real-world situations that involve direct and inverse variation. (A.I.P.2)
- * Write equations of lines using point slope form. (A.I.P.5 and A.I.P.6)
- * Graph absolute value equations using translations. (A.I.P.10)
- * Write an equation of a direct variation. (A.I.P.2)
- * Use ratios and proportions with direct variations. (A.I.P.2)
- * Solving systems of equations using substitution. (A.I.P.12)
- * Write systems of linear equations. (A.I.P.12)
- * Solve quadratic equations by completing the square. (A.I.P.9)
- Utilize technology to aid in the analysis of functions, and to situations involving algebra. (A.I.P.11 and A.I.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. (A.I.P.2)
- Identify, analyze, and justify the use of the Pythagorean Theorem. (G.G.7)
- * Translate the graph of an absolute value equation. (A.I.P.10)
- * Find the distance between two points on a coordinate plane. (G.G.12)
- * Find the coordinate of the midpoint of a line segment. (G.G.12)
- * Introduce special right triangles. (G.G.8)

- Apply technology to geometry from an algebraic, geometric, and spatial perspective. (G.G.14)

Strand 4: Measurement

NCTM Standard (State Standard)

- Calculate perimeter, circumference, and area of common geometric figures. (G.M.1)
- Use measurement in word problems (e.g. rate, work, distance, percent mixture). (A1.N.4 and A1.P.2)

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)
- Find mean, median, and mode of sets of data. (A1.D.1)
- 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.P.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
- Departmental Semester Exams
- School Wide and Department Rubrics