



Department of Teaching & Learning
Parent/Student Course Information

ALGEBRA I HONORS

(MA 3220)

One credit, one year

Grades 7-8

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

Algebra I Honors is a mathematics course for students who exhibit high mathematical ability and achievement. The course is designed to prepare students for Scientific, Technology, Engineering and Mathematics (STEM) fields. The course focuses on the development of problem-solving skills and the acquisition of mathematical vocabulary and symbols. The active engagement of students along with the use of manipulatives and technology, such as calculators, computers and spreadsheets, will allow students to develop an understanding of the mathematical principles they are learning. Facility in the use of technology will not be a substitute for students' understanding of quantitative concepts and proficiency in computations. Topics include variables and expressions; solving equations and inequalities; linear, quadratic and exponential functions; graphing and writing linear equations; systems of equations and inequalities; polynomials; factoring; statistics; and rational expressions. Students in Algebra I Honors will focus on both the abstract, theoretical explorations of the concepts along with their applications in a STEM environment. Students will engage in mathematical discourse with the teacher and other students. Students will take the Standards of Learning (SOL) test for Algebra I or a substitute test approved by the State Board of Education. Specific dates for the administration of the SOL test will be announced by the school. **Students cannot receive credit for both Algebra I Honors and Algebra I Part 1 (MA3216) or Algebra I Part 2 (MA3218).**

PREREQUISITE

Pre-Algebra, Advanced Mathematics 7 or Mathematics 8

OPTIONS FOR NEXT COURSE

Geometry Honors

REQUIRED TEXTBOOK

Glencoe Algebra 1 (Virginia Edition). John A. Carter, Ph.D., Gilbert J. Cuevas, Ph.D., Roger Day, Ph.D., and Carol Malloy, Ph.D. Glencoe McGraw-Hill (2012)

RECOMMENDED CALCULATOR

TI-83 Plus, TI-84 Plus, TI-84 Plus C or TI-84 Plus CE

Virginia Beach Instructional Objectives
Algebra I Honors – MA3220

VBO#	Objective
	Unit 1: Variables and Expressions
A1H.EX.1.2	The student will estimate and express the square roots and cube roots of whole numbers. (SOL A.3)
A1H.EX.1.3	The student will write mathematical expressions for verbal expressions and verbal expressions for mathematical expressions and evaluate the expressions for given replacement values of the variables, including applications in science, technology, engineering or mathematics (STEM). (SOL A.1)
A1H.EQ.1.4	The student will identify and apply the field properties and axioms of equality valid for sets of real numbers and its subsets. (SOL A.4 b)
A1H.EX.1.5	The student will perform operations with real numbers, using order of operations to evaluate numeric and variable expressions, including applications in science, technology, engineering or mathematics (STEM), and will simplify algebraic expressions. (SOL A.1)
	Unit 2: Solving Equations
A1H.EQ.2.1	The student will solve first-degree, multi-step equations including ratios, proportions, percent of change and variables on both sides and apply them to problems involving science, technology, engineering or mathematics (STEM). The student will justify operations using the properties of real numbers and confirm algebraic solutions using a graphing calculator. (SOL A.4 b, d, f)
A1H.EQ.2.2	The student will manipulate formulas and literal equations for a specified variable and apply them to problems involving science, technology, engineering or mathematics (STEM). (SOL A.4 a)
A1H.EQ.2.3	The student will solve absolute value equations and confirm algebraic solutions using a graphing calculator.
	Unit 3: Linear Functions
A1H.FN.3.1	The student will investigate and analyze linear functions and their characteristics both algebraically and graphically, including determining whether a relation is a function, identifying the domain and range and finding the values of a function for elements in its domain. Students will make connections between and among multiple representation of functions, including concrete, verbal, numeric, graphic and algebraic. (SOL A.7 a, b, e, f)
A1H.EQ.3.2	The student will graph linear equations in two variables using the x- and y-intercepts. Solutions to linear equations will be identified using the zeros of a related function. (SOL A.7 c, d)
A1H.EQ.3.3	The student will determine the slope of a line when given the equation of the line, the graph of the line or two points on the line. Slope will be described as rate of change and will be positive, negative, zero or undefined. (SOL A.6 a)
A1H.FN.3.4	The student, given a situation in science, technology, engineering or mathematics (STEM), will analyze a relation to determine whether a direct or inverse variation exists and represent direct and inverse variations algebraically and graphically. (SOL A.8)
A1H.FN.3.5	The student will recognize patterns involving arithmetic and geometric sequences and write equations to generate arithmetic and geometric sequences with applications in science, technology, engineering or mathematics (STEM).
	Unit 4: Graphing and Writing Linear Equations
A1H.EQ.4.1	The student will graph linear equations in two variables, identify the slope and y-intercept of a linear graph and use transformations of the parent function, $y = x$, to identify the graphs of transformed linear equations. (SOL A.6 a, A.7 c, d)

VBO#	Objective
A1H.EQ.4.2	The student will write the equation of a line when given the graph of the line, two points on the line or the slope and a point on the line. The student will apply writing equations of lines to problems in science, technology, engineering or mathematics (STEM). (SOL A.6 b)
A1H.EQ.4.3	The student will find the slope of lines to determine when two lines are parallel or perpendicular.
A1H.ST.4.4	The student will collect and analyze data, determine the equation of a line of best fit in order to make predictions and solve problems in science, technology, engineering or mathematics (STEM) using mathematical models. (SOL A.11)
Unit 5: Solving Inequalities in One Variable	
A1H.EQ.5.1	The student will solve first-degree, multi-step inequalities and apply them to problems involving science, technology, engineering or mathematics (STEM). The student will justify operations using the properties of real numbers and confirm algebraic solutions using a graphing calculator. Students will recognize the solution set both algebraically, using set builder notation and interval notation and graphically. (SOL A.5 a, b, c)
A1H.EQ.5.2	The student will solve first-degree compound and absolute value inequalities and apply them to problems involving, science, technology, engineering or mathematics (STEM). The student will justify operations using the properties of real numbers and confirm algebraic solutions using a graphing calculator. Students will recognize the solution set algebraically, using set builder notation and interval notation and graphically.
Unit 6: Solving Systems of Equations	
A1H.EQ.6.1	The student will solve systems of equations in two variables algebraically and graphically, using graphing calculators to verify solutions. (SOL A.4 e)
A1H.EQ.6.2	The student will solve linear inequalities and systems of linear inequalities in two variables and use a graph to represent the solution set. (SOL A.5 d)
Unit 7: Laws of Exponents and Polynomials	
A1H.EX.7.1	The student will apply the laws of exponents to perform operations on expressions, recognize the relationship between the laws of exponents and scientific notation and apply scientific notation to problems in science, technology, engineering or mathematics (STEM). (SOL A.2 a)
A1H.EX.7.2	The student will add, subtract and multiply polynomials and use polynomials to model situations in science, technology, engineering or mathematics (STEM). (SOL A.2 b, 2009)
Unit 8: Factoring and Solving Quadratic Equations	
A1H.EX.8.1	The student will factor completely first and second-degree binomials and trinomials in one or two variables. In addition, students will factor polynomials with four terms, using grouping. Graphing calculators will be used as tools for factoring and for confirming algebraic factorizations. (SOL A.2 c)
A1H.EQ.8.2	The student will solve a quadratic equation in one variable using factoring and apply quadratics to problems involving science, technology, engineering or mathematics (STEM). (SOL A.4 c)
A1H.EX.8.3	The student will find the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor. The student will use long division to divide non-factored divisors. (SOL A.2b)
Unit 9: Quadratic Functions and Curve Fitting	
A1H.FN.9.1	The student will graph quadratic functions in two variables, identify the domain and range, the vertex, the zero(s) of the quadratic function and use transformations of the parent function, $y = x^2$, to identify the graphs of transformed quadratic equations. (SOL A.7)
A1H.EQ.9.2	The student will solve a quadratic equation in one variable using graphing, square roots, the quadratic equation and completing the square and use quadratic equations to solve problems involving science, technology, engineering or mathematics (STEM). The value of the

VBO#	Objective
	discriminant will be used to determine the nature of the solutions of a quadratic equation. (SOL A.4 c)
A1H.EX.9.3	The student will express the solutions of quadratic equations as simplified square roots. Students will express the square root of a monomial algebraic expression in simplest radical form. (SOL A.3)
A1H.FN.9.4	The student will use transformations of the parent function, $y = a^x$, to identify the graphs of transformed exponential functions and identify values of the base that result in exponential growth versus decay, applying exponential functions to situations in science, technology, engineering or mathematics (STEM).
A1H.ST.9.5	The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions and solve problems in science, technology, engineering or mathematics (STEM) using mathematical models. (SOL A.11)
Unit 10: Statistics	
A1H.ST.10.1	The student will compare and contrast multiple univariate data sets, using box-and-whisker plots. (SOL A.10)
A1H.ST.10.2	The student, given a set of data, will interpret variation in science, technology, engineering or mathematics (STEM) related contexts and calculate and interpret mean absolute deviation, standard deviation and z-scores. (SOL A.9)
Unit 11: Rational Expressions and Equations	
A1H.EX.11.1	The student will simplify a rational expression, determine restrictions and excluded values for a rational expression, multiply and divide rational expressions, graph rational functions and solve equations containing rational expressions.

Dr. Aaron C. Spence, Superintendent
Virginia Beach City Public Schools
2512 George Mason Drive, Virginia Beach, VA 23456-0038

Produced by the Department of Media and Communications for the Department of Teaching and Learning.
For further information please call (757) 263-1070.

Notice of Non-Discrimination Policy

Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups. School Board policies and regulations (including, but not limited to, Policies 2-33, 4-4, 4-6, 4-43, 5-7, 5-19, 5-20, 5-44, 6-7, 7-48, 7-49, 7-57 and Regulations 4-4.1, 4-4.2, 4-6.1, 4-43.1, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, counseling services, physical education and athletic, vocational education, instructional materials and extracurricular activities.

To seek resolution of grievances resulting from alleged discrimination or to report violations of these policies, please contact the Title VI/Title IX Coordinator/Director of Student Leadership at (757) 263-2020, 1413 Laskin Road, Virginia Beach, Virginia, 23451 (for student complaints) or the Section 504/ADA Coordinator/Chief Human Resources Officer at (757) 263-1133, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (for employees or other citizens). Concerns about the application of Section 504 of the Rehabilitation Act should be addressed to the Section 504 Coordinator/Executive Director of Student Support Services at (757) 263-1980, 2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write The Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email her at Dena.McElligott@VBSchools.com

vbschools.com
your virtual link to Hampton Roads' largest school system



VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

No part of this publication may be produced or shared in any form without giving specific credit to Virginia Beach City Public Schools.

(Revised August 2017)