Department of Teaching & Learning
Parent/Student Course Information

ADVANCED MATHEMATICS 7
(MA 3111)
One year

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.

FOCUS OF MIDDLE SCHOOL MATHEMATICS LEARNING
- To build on students' concrete reasoning experiences developed in previous grades
- To construct through active learning experiences a more advanced understanding of mathematics
- To develop deep mathematical understandings required for success in abstract learning experiences
- To apply mathematics as a tool in solving real world problems

COURSE DESCRIPTION
Advanced Mathematics 7 is a course for seventh grade students that extends concepts and skills learned in previous grades and prepares students for more abstract concepts in algebra and geometry. The course focuses on computation with rational numbers and the use of proportions to solve a variety of problems. Concepts include solving multi-step equations and inequalities, graphing linear functions, visualizing three-dimensional shapes represented in two-dimensional drawings, and applying transformations (translations, reflections, and dilations) of geometric shapes in the coordinate plane. Students will verify and apply the Pythagorean Theorem; represent relations and functions using tables, graphs, and rules; and represent data in boxplots and scatterplots. The active engagement of students along with the use of manipulatives (i.e. number lines, fraction circles, algebra tiles, and two-color counters) and technology, such as Chromebooks and the Desmos calculator, 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 basic computations. The course objectives provide a solid foundation for Algebra I.

PREREQUISITE
Advanced Mathematics 6

OPTIONS FOR NEXT COURSE
Mathematics 8 or Algebra I (Honors or Series)

REQUIRED TEXTBOOK
There is no textbook. Mathspace is the adopted digital resource for this course.

RECOMMENDED CALCULATOR
TI-30Xa SEVA or use Desmos online calculator

Number and Number Sense
7.1   The student will
            e) identify and describe absolute value of rational numbers.
8.1   The student will compare and order real numbers.
8.2   The student will describe the relationships between the subsets of the real number system.
8.3   The student will
            a) estimate and determine the two consecutive integers between which a square root lies; and
            b) determine both the positive and negative square roots of a given perfect square.

Computation and Estimation
7.2   The student will solve practical problems involving operations with rational numbers.
7.3   The student will solve single-step and multistep practical problems, using proportional reasoning.
8.4   The student will solve practical problems involving consumer applications.

Measurement and Geometry
7.5   The student will solve problems, including practical problems, involving the relationship between
        corresponding sides and corresponding angles of similar quadrilaterals and triangles.
7.6   The student will
            b) determine unknown side lengths or angle measures of quadrilaterals.
7.7   The student will apply translations and reflections of right triangles or rectangles in the coordinate plane.
8.5   The student will use the relationships among pairs of angles that are vertical angles, adjacent angles,
        supplementary angles, and complementary angles to determine the measure of unknown angles.
8.6   The student will
            a) solve problems, including practical problems, involving volume and surface area of cones and
               square-based pyramids; and
            b) describe how changing one measured attribute of a rectangular prism affects the volume and
               surface area.
8.7   The student will
            a) given a polygon, apply transformations, to include translations, reflections, and dilations, in
               the coordinate plane; and
            b) identify practical applications of transformations.
8.8   The student will construct a three-dimensional model, given the top or bottom, side, and front views.
8.9   The student will
            a) verify the Pythagorean Theorem; and
            b) apply the Pythagorean Theorem.

Probability and Statistics
7.8   The student will
- a) determine the theoretical and experimental probabilities of an event; and
- b) investigate and describe the difference between the experimental probability and theoretical probability of an event.

8.11   The student will
- a) compare and contrast the probability of independent and dependent events; and
- b) determine probabilities for independent and dependent events.

8.12   The student will
- a) represent numerical data in boxplots;
- b) make observations and inferences about data represented in boxplots; and
- c) compare and analyze two data sets using boxplots.

8.13   The student will
- a) represent data in scatterplots;
- b) make observations about data represented in scatterplots; and
- c) use a drawing to estimate the line of best fit for data represented in a scatterplot.

Patterns, Functions, and Algebra
7.10   The student will
- c) determine the y-intercept, b, in an additive relationship between two quantities and write an equation in the form $y = x + b$ to represent the relationship;
- d) graph a line representing an additive relationship between two quantities given the y-intercept and an ordered pair, or given the equation in the form $y = x + b$, where b represents the y-intercept; and
- e) make connections between and among representations of a proportional or additive relationship between two quantities using verbal descriptions, tables, equations, and graphs.

7.11   The student will evaluate algebraic expressions for given replacement values of the variables.

7.13   The student will solve two-step linear inequalities in one variable, including practical problems, involving addition, subtraction, multiplication, and division, and graph the solution on a number line. Please Note: This standard has been modified to only include two-step inequalities. One-step inequalities is covered in Advanced Math 6.

8.14   The student will
- a) evaluate an algebraic expression for given replacement values of the variables; and
- b) simplify algebraic expressions in one variable.

8.15   The student will
- a) determine whether a given relation is a function; and
- b) determine the domain and range of a function.

8.16   The student will
- a) recognize and describe the graph of a linear function with a slope that is positive, negative, or zero;
- b) identify the slope and y-intercept of a linear function, given a table of values, a graph, or an equation in $y = mx + b$ form;
- c) determine the independent and dependent variable, given a practical situation modeled by a linear function;
- d) graph a linear function given the equation in $y = mx + b$ form; and
- e) make connections between and among representations of a linear function using verbal descriptions, tables, equations, and graphs.

8.17   The student will solve multistep linear equations in one variable with the variable on one or both sides of the equation, including practical problems that require the solution of a multistep linear equation in one variable.

8.18   The student will solve multistep linear inequalities in one variable with the variable on one or both sides of the inequality symbol, including practical problems, and graph the solution on a number line.

8.10   The student will solve area and perimeter problems, including practical problems, involving composite plane figures.

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

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Title IX Notice: Complaints or concerns regarding discrimination on the basis of sex or sexual harassment should be addressed to the Title IX Coordinator, at the VBCPS Office of Student Leadership, 641 Carriage Hill Road, Suite 200, Virginia Beach, 23452, (757) 263-2020, Mary.Dees@vbschools.com (student complaints) or the VBCPS Department of School Leadership, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (757) 263-1088, Elizabeth.Bryant@vbschools.com (employee complaints). Additional information regarding Virginia Beach City Public Schools' policies regarding discrimination on the basis of sex and sexual harassment, as well as the procedures for filing a formal complaint and related grievance processes, can be found in School Board Policy 5-44 and School Board Regulations 5-44.1 (students), School Board Policy 4-4 and School Board Regulation 4-4.3 (employees), and on the School Division's website at Diversity, Equity and Inclusion/Title IX. 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, Plaza Annex/Family and Community Engagement Center, 641 Carriage Hill Road, Suite 200, Virginia Beach, VA 23452.

The School Division is committed to providing educational environments that are free of discrimination, harassment, and bullying. Students, staff, parents/guardians who have concerns about discrimination, harassment, or bullying should contact the school administration at their school. Promptly reporting concerns will allow the school to take appropriate actions to investigate and resolve issues. School Board Policy 5-7 addresses non-discrimination and anti-harassment, Policy 5-44 addresses sexual harassment and discrimination based on sex or gender. Policy 5-36 and its supporting regulations address other forms of harassment.

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.

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VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

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