

Math Curriculum Parent Guide

School: High School

Grade: **Integrated Math I**

Course Description: The first year of the integrated mathematics program will achieve the integration and unification of topics in algebra and geometry. In accordance with the National Council of Teachers of Mathematics this course emphasizes problem solving, critical thinking, communication, and connections among mathematical topics and connections between mathematics and other subject areas. The goal of these courses is to develop proficiency, to expand understanding, to improve logical thinking and to promote the success of mathematical skills and concepts.

Unit	Concepts
Geometry	Identify congruent polygons Classify quadrilaterals by symmetry
Measurement	Appropriately use standard area formulae Use right triangle trigonometry to find missing parts of triangles
Number Sense and Operations	Effectively use order of operations to solve equations Simplify and multiply square roots
Patterns, Relations and Algebra	Simplify algebraic expressions Solve linear equations and inequalities with variables on both sides and fractional/decimal coefficients Apply algebraic and graphical methods to solve everyday problems including mixture, rate and work problems Solve absolute value equations and inequalities Identify a function Graph linear equations using various techniques Calculate slope and y-intercept Add and subtract polynomials
Data Analysis, Statistics and Probability	Collect, organize, analyze and display data appropriately

Suggestions for Parental Involvement:

Make sure your student is keeping a notebook. Almost all classes have daily homework. Students are required to show all work on their homework papers. Please encourage studying for math tests. There are review problems in all of the text books, as well as many extra problems we can't assign in one night. Students need to DO MATH PROBLEMS to study for a test. All formulae should be memorized, even if a teacher will offer formulae sheets as back up. If your child doesn't know the formulae he will lose time trying to apply it. When using formulae, the formulae should be written each time it is used. The second step is to substitute in the given information, and then the students can use their algebraic skills to solve the problem. All work must be clearly done. Great Source has a wonderful resource called *Algebra to Go*, available online at www.greatsource.com.

School: High School

Grade: **Integrated Math II**

Course Description: The second year of our integrated math program emphasizes logical reasoning, measurement, probability, statistics, discrete mathematics and functions. Relational understanding is stressed throughout the course to provide a good foundation for continued studies in mathematics. This is an MCAS year for all sophomores in the course.

Unit	Concepts
Geometry	Identify properties of quadrilaterals Prove theorems about parallel lines, triangles and quadrilaterals Identify and determine the measure of central and inscribed angles and their associated major and minor arcs Recognize and solve problems with radii, chords, and arcs within or on the same circle Apply congruence and similarity to find missing parts of triangles and provide justification Calculate distance between two points and midpoint of a line
Measurement	Calculate volume and surface area of solids Solve problems utilizing area, volume, surface area and perimeter
Number Sense and Operations	Introduce the use of negative and fractional exponents Relate changes in measurement of one attribute to changes in other: how change in radius affects change in volume etc
Patterns, Relations and Algebra	Solve systems of equations Solve quadratics by factoring, completing the square or quadratic formula Graph parabolas using phase shifts Simplify simple expressions with exponents Multiply polynomials Divide polynomial by monomial Apply appropriate methods to solve everyday problems that can be modeled using linear, reciprocal, quadratic or exponential functions including: compound interest, direct and inverse variations
Data Analysis, Statistics and Probability	Recognize errors in reasoning Describe and explain how relative sizes of a sample and the population affect the validity of predictions from data Select and use appropriate statistical tools to analyze data

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formulae should be written each time it is used. The second step is to substitute in the given information, and then the students can use their algebraic skills to solve the problem. All work must be clearly done.

We incorporate MCAS review into this course. Please make sure your student is taking advantage of all the opportunities that are offered. You may want two resources for this course: *Algebra to Go* and *Geometry to Go*, available on-line from Great Source, at www.greatsource.com.

School: High School

Grade: **Integrated Math III**

Course Description: Throughout the three-year sequence the integrated math program presents the same mathematical topics as Algebra I/Geometry /Algebra II . This year statistics and higher order functions are emphasized, preparing students for Pre-Calculus.

Unit	Concepts
Geometry	Prove congruent triangles by 2-column, coordinate and paragraph proofs Identify polyhedra ,arcs, angles, and chords of circles
Measurement	Find measure of interior angles of polygons, arcs, angles, chords of circles
Number Sense and Operations	Simplify numerical expressions with powers and roots, including fractional and negative exponents Define complex numbers and relate to real and rational numbers
Patterns, Relations and Algebra	Solve systems of equations using matrices Solve a variety of equations and inequalities with linear, quadratic, absolute value, polynomial, radical and rational functions Recognize functions as exponential and logarithmic Solve everyday problems that can be modeled using polynomial, rational, exponential, logarithmic, absolute value and square roots Describe the translations and scale changes of a given function: $y = a f(b(x+c/b) +d$ Find the inverse of a function Identify arithmetic and geometric sequences and finite arithmetic and geometric series Apply the properties of series to solve problems

Data Analysis, Statistics and Probability	Calculate standard deviation Identify normal distributions Use combinations/permutations to solve problems, including probability of compound events
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School: High School

Grade: **Pre-Calculus**

Course Description: The topics selected for this course are designed to prepare the student for advanced mathematics. It will provide the essential concepts and skills of algebra, trigonometry and the study of functions. Special emphasis is give to the preparation for the study of calculus. The difficulty of the problems presented and depth of presentation is adjusted to meet the needs of students at each level.

Unit	Concepts
Geometry	Demonstrate an understanding of the laws of sines and cosines. Apply laws to solve for unknown sides and angles Use vectors to solve problems Apply properties of angles, parallel lines, arcs, radii, chords, tangents and secants to solve problems
Measurement	Describe relationship between degree and radian measure Use radian measure to solve problems involving angular velocity and acceleration Use dimensional analysis to confirm that

	expressions/equations make sense
Number Sense and Operations	Add, subtract, and multiply complex numbers
Patterns, Relations and Algebra	<p>Relate the number of roots of a polynomial to the degree. Demonstrate an understanding of the trigonometric functions</p> <p>Relate functions to their geometric definitions Explain the identity $\sin^2 x + \cos^2 x = 1$ Demonstrate an understanding of the formulae for sine and cosine of the sum and the difference Use known formula to derive other formula and apply in problem solving Use phase shifts to graph trigonometric functions Identify and discuss features of conic sections</p>
Data Analysis, Statistics and Probability	Apply regression results and curve fitting to data sets

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