

Mathematics Program

The Sachem Mathematics Department is committed to providing meaningful courses designed to motivate and encourage mathematical and critical thinking. The mathematics courses offered will not only aid in development of conceptual understanding of mathematics, but will increase problem solving skills and enhance students' abilities to communicate and reason mathematically.

Sachem's Mathematics Core Requirement: 3 Years

Students entering ninth grade after September 2001 and through September 2006 must take the Regents exam in Math A. The passing grade for a Local Diploma is 55 and the passing grade for a Regents Diploma is 65.

Students entering grade 9 in September 2007 and thereafter must take the Algebra Regents exam. Please see page 11 for specific diploma requirements for students entering grade 9 in 2007 and thereafter.

- A. Local or Regents Diploma
 1. Pass Math A - course and Regents
 2. Plus two additional mathematics courses from the list below for a total of 3 credits:
- B. Regents Diploma with Advanced Designation
 1. Pass Math A - course (s) and Regents and Math B - course (s) and Regents **OR** Integrated Algebra, Geometry, Alg. 2/Trigonometry
 2. Earn at least 3 credits in mathematics

Courses for three mathematics credits:

- Integrated Algebra 1
- Integrated Algebra 1A
- Integrated Algebra 1B
- Math A/B Honors*
- Math A* or Math A1 Extended*
- Math A2 Extended*
- Math B Honors**
- Math B1 or Math B1 Extended*
- Math B2 or Math B2 Extended**
- Occupationally Related Mathematics
 - Geometry Regents
 - Geometry Honors
 - Geometry Regents Extended
 - Intermediate Algebra**
 - Algebra II/Trigonometry
 - Algebra II/Trigonometry Extended
 - Math 12 or 12H
 - Analysis of Math

*Courses not offered after 2007-08

**Courses not offered after 2008-09

Please Note: Graphing Calculators (TI-83 or TI-84) are required for the Integrated Algebra, Integrated Algebra 1B, Geometry, Geometry Honors, Algebra 2/Trigonometry Honors and Algebra 2/Trigonometry courses and on the New York State Regents exams in these courses.

Integrated Algebra 1A - (9, 10) Full Yr., 1 Cr.
This course is for students who have been identified as needing Academic Intervention Services.

Pre-requisite: Math 8. Integrated Algebra 1A is the first course of a two year program designed to prepare students for the Integrated Algebra Regents Exam. This course explores concepts including: sets, solving equations in the context of real world problems, two dimensional and three dimensional geometric forms, and right triangle trigonometry. There will be a departmental final exam at the conclusion of this course. Students do not take a Regents exam this year. A scientific or graphing calculator will be used throughout the course.

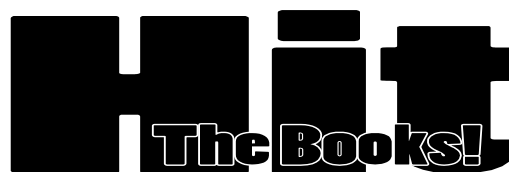
Integrated Algebra 1B (10, 11) Full Yr., 1 Cr.

Pre-requisite: Integrated Algebra 1A. Integrated Algebra 1B is the second course of a two year program designed to prepare students for the Integrated Algebra Regents Exam. This course offers a comprehensive review of the concepts covered in Integrated Algebra 1A, as well as develops new concepts to complete the curriculum. Additional topics covered include: exponential growth and decay, linear regression, quadratic linear systems and real-life applications of mathematics. At the conclusion of this course students will take the New York State Integrated Algebra Regents Exam. A graphing calculator will be used throughout the course and on the Regents exam.

Integrated Algebra 1 Regents (9, 10, 11, 12)

Full Yr., 1 Cr.

Pre-requisite: Math 8. New York State requires all students to pass the Integrated Algebra 1 course and Regents exam to satisfy Regents diploma requirements. The Integrated Algebra course will cover solving linear equations and inequalities along with their applications. The student will solve systems of equations, both algebraically and graphically. The role of polynomials and their operations will be discussed. An introduction to right triangle trigonometry, probability and statistics will be covered. Student will study the Integrated Algebra 1 curriculum for 5 periods per week and take the Integrated Algebra 1 Regents exam in June. A graphing calculator will be used throughout the course and on the Regents exam.



Geometry Honors (9)**Full Yr., 1 Cr.**

Pre-requisite: **Integrated Algebra Honors.** This is the second course in New York State's three year Integrated Algebra, Geometry and Algebra 2/Trigonometry Regents sequence. Entrance into this course is limited to honors students who have successfully completed Integrated Algebra Honors and meet the requirements listed on the honors recommendation form. This class will not only meet New York State's curriculum requirements, but will go beyond the Regents level by exploring topics, theories and applications of higher order mathematics. This course is more intensive and more extensive than the Geometry Regents curriculum and may include a math project and participation in several math competitions. All students will take the New York State Geometry Regents examination in June. A graphing calculator will be used throughout the course and on the Regents exam.

Geometry Regents (10, 11, 12)**Full Yr., 1 Cr.**

Pre-requisite: **Integrated Algebra.** This is the second course in New York State's three year Integrated Algebra, Geometry and Algebra 2/Trigonometry sequence Regents. Students will have the opportunity to explore an integrated approach to the study of geometric relationships. Students will investigate properties of triangles, quadrilaterals, and circles; formal and informal proofs; transformational and coordinate geometry; 3-dimensional geometry and logic. This course is designed to help students develop an understanding of how reasoning and proof are fundamental aspects of mathematics. All students will take the New York State Geometry Regents examination in June. A graphing calculator will be used throughout the course and on the Regents exam.

Geometry Regents Extended (10, 11, 12)**Full Yr., 1 Cr.****Lab Alternate Days**

Pre-requisite: **Integrated Algebra or Integrated Algebra 1B.** This is the second course in New York State's three year Integrated Algebra, Geometry and Algebra 2/Trigonometry Regents sequence. This course is offered to students who have demonstrated satisfactory ability in mathematics. Students will study the Geometry curriculum for 7 1/2 periods per week (one period each day plus one extra period on alternate days). The extra class time allows the pace of the instruction to be more appropriate to accommodate students who have experienced difficulty in math in the past. Students will have the opportunity to explore an integrated approach to the study of geometric relationships. Students will investigate properties of circle, triangles, and quadrilaterals; formal and informal proofs; transformational and coordinate geometry and logic. This course is designed to help students develop an understanding of how reasoning and proof are fundamental aspects of mathematics. All students will take the New York State Geometry Regents examination in June. A graphing calculator will be used throughout the course and on the Regents exam.

Geometry Skills (10, 11, 12)**Full Yr., 1 Cr.**

Pre-requisite: **Placement must be determined by the Committee on Special Education.** This course is designed to strengthen the students' algebraic skills and to enable them to apply these skills to more advanced geometry topics and practical application problems and projects. Some of the topics covered are axioms and postulates, congruence, triangles, inequalities, parallel and perpendicular lines, angle sum, locus, circles, angle measurement, similarity, areas, polygons, constructions, trigonometry and coordinate geometry. This course terminates with a departmental final exam.

Algebra 2/Trigonometry Regents (11, 12)**Full Yr., 1 Cr.**

Pre-requisite: **Geometry Regents.** Algebra 2/Trigonometry is the third and final course offered in the New York State series. This course is offered to students who have demonstrated average ability or above average ability in mathematics and can work at the pace of a Regents level class. Students will have the opportunity to explore an integrated approach to the study of advanced algebra and trigonometry concepts. Students will represent and analyze algebraically a wide variety of problem solving situations including absolute value, radicals, rational expressions and logarithmic expressions. Students will also recognize and use patterns, relations and functions as they apply to sequences and series, coordinate geometry and trigonometry. Students will also collect, organize, display and analyze data as well as make predictions based on theoretical and empirical probabilities. Students will use a graphing calculator throughout the course. All students will take the New York State Algebra 2/Trigonometry Regents examination in June.



Algebra 2/ Trigonometry Honors (10) Full Yr., 1 Cr.
Pre-requisite: Geometry Honors. Algebra 2/ Trigonometry is the third and final course offered in the New York State Regents series. Entrance into this course is limited to honors students who have successfully completed Geometry Honors and meet the requirements listed on the honors recommendation sheet. This class will not only meet the State's curriculum requirements, but will go beyond the Regents level by exploring topics, theories and applications of higher order mathematics. Students will have the opportunity to explore an integrated approach to the study of advanced algebra and trigonometry concepts. Students will represent and analyze algebraically a wide variety of problem solving situations including absolute value, radicals, rational expressions and logarithmic expressions. Students will also recognize and use patterns, relations and functions as they apply to sequences and series, coordinate geometry and trigonometry. Students will also collect, organize, display and analyze data as well as make predictions based on theoretical and empirical probabilities. This course is more intensive and more extensive than the Algebra 2/ Trigonometry Regents curriculum and may include a math project and participation in several math competitions. Students will use a graphing calculator throughout the course. All students will take the New York State Algebra 2/ Trigonometry Regents examination in June.

Algebra 2/ Trigonometry Extended (11, 12)

Full Yr., 1 Cr.

Pre-requisite: Geometry Regents or Geometry Extended. Algebra 2/ Trigonometry is the third and final course offered in the New York State Regents series. This course is offered to students who have demonstrated satisfactory ability in mathematics. Students will study the Algebra 2/ Trigonometry curriculum for 7½ periods per week (one period each day plus one extra period on alternate days). The extra class time allows the pace of the instruction to be more appropriate to accommodate students who have experienced difficulty in math in the past. Students will have the opportunity to explore an integrated approach to the study of advanced algebra and trigonometry concepts. Students will represent and analyze algebraically a wide variety of problem solving situations including absolute value, radicals, rational expressions and logarithmic expressions. Students will also recognize and use patterns, relations and functions as they apply to sequences and series, coordinate geometry and trigonometry. Students will also collect, organize, display and analyze data as well as make predictions based on theoretical and empirical probabilities. Students will use a graphing calculator throughout the course. All students will take the New York State Algebra 2/ Trigonometry Regents examination in June.



Analysis of Mathematics (12 only) Full Yr., 1 Cr.
Pre-requisite: Math B2 Extended or Intermediate Algebra. This course is for students who plan to attend college, but do not plan to pursue a math/science based major. This course will give students a strong mathematical foundation to aid in their success on math placement exams for college. Success on placement exams ensures qualifying for enrollment into a matriculated math course in college. The course will cover various topics of mathematics not previously studied by the student. It will also explore topics previously studied but with greater depth and extension. The curriculum includes algebra, analytic geometry, trigonometry, functions, graphs, systems of equations, and inequalities. There will be a departmental final exam in June.

Math 12 (Precalculus) (11, 12) Full Yr., 1 Cr.

Pre-requisite: Math B2 or B2 Extended. This course is for students who have demonstrated success in mathematics at a Regents pace. This course is the pre-requisite for college level calculus. The curriculum includes algebra, trigonometry, complex numbers, vectors, matrices, polynomials, rational and algebraic functions, induction, sequences and series. Calculus topics include limits, derivatives, rectilinear motion, maxima/minima and graphing applications. A graphing calculator will be used to explore some topics. There will be a departmental final exam at the conclusion of this course.

MATH

Math 12 Honors (11) Full Yr., 1 Cr.

Pre-requisite: Math B Honors and teacher recommendation. This course is a survey of mathematics covering advanced topics in algebra, linear algebra and elementary functions. This course will also include the following topics: trigonometry, mathematical induction, vectors, analytic geometry, functions, graphs of polynomial functions, circular functions, polar coordinates and graphs, conic sections, matrices, limits, introduction to derivatives of functions and integration of functions. In addition, the honors students will participate in the Suffolk County Math Contest and several other optional math contests. The students will complete a research paper which may be entered in the Long Island Math Fair. It is expected that the students who are successful in this course will be enrolled in either Calculus AB or Calculus BC in their senior year. This course is both more intensive and more extensive than Math 12. Students will use a TI-89 calculator, which will be used throughout this course and in the Calculus courses that follow. A departmental final will be given in June.

A.P. Statistics (10, 11, 12)**Full Yr., 1 Cr.**

This course is recommended for students enrolled in AP Psychology and/or Science Research.

Pre-requisite or co-requisite: Geometry, Geometry Honors, Math B2 or B Honors. This course is equivalent to a one semester introductory non calculus based college course. Students will be exposed to four broad conceptual themes:

1. Exploring data
2. Deciding what and how to measure
3. Producing models using probability and simulation
4. Statistical inference and hypothesis testing

Topics included in these themes are the normal distribution, bivariate data, simulating experiments, the study of randomness, binomial and geometric distributions, sampling distributions, z-test, t-test, chi-square test, and inference for two way tables. The use of a graphing calculator and statistical software is an integral part of this course. Students are encouraged to take the AP exam in May. A final project that incorporates the four conceptual themes is required. There will be a departmental final exam at the conclusion of this course.

**Occupationally Related Mathematics (12)****Full Yr., 1 Cr.**

Students will be taught how to use mathematical procedures in problem solving, decision-making, and day-to-day operations within cross-sections of occupations. They will learn how several areas of mathematics, such as calibrations, measurements, pressure, money management, grading systems, and data presentations can be applied in a variety of employment tasks. Students who have passed Geometry, Intermediate Algebra, Math B1 or B2 may not take this course. **Please note that ORM cannot be used as a second math credit for any student.**

Calculus AB (Advanced Placement) (12)**Full Yr., 1 Cr.**

Pre-requisite: Math 12 or Math 12 Honors. This course covers the Advanced Placement syllabus level AB. Students are strongly encouraged to take the Advanced Placement examination which may lead to college credit. There is a departmental final examination in this course. Students will use a Texas Instruments TI-89 graphing calculator which will be used in class all year and on the AP examination.

Calculus BC (Advanced Placement) (12)**Full Yr., 1 Cr.**

Pre-requisite: Math 12 Honors. This course covers Advanced Placement syllabus level BC. Students are strongly encouraged to take the Advanced Placement examination which may lead to college credit. There is a final exam in this course. Students will use a Texas Instruments TI-89 graphing calculator which will be used in class all year and on the AP examination.

Introduction C++ (10, 11, 12) One Semester, 1/2 Cr.

Pre- or co-requisite: Geometry, Geometry Honors or Math B. Students will be taught the specific features of the C++ programming language and its application to the solution of common classes of Algorithms. IBM Pentium computers will be used.

Introduction to Programming in Java (10, 11, 12)**One Semester, 1/2 Cr.**

Pre- or co-requisite: Geometry, Geometry Honors or Math B. This is an introduction to programming using the Java language. Pupils will be taught the specific features of this language. Students will be exposed to common, everyday problems that can be solved by writing computer programs. All programs will be written by the students. These programs will be run on IBM computers.

Advanced Placement Computer Science (11, 12)**Full Yr., 1 Cr.**

Pre- or co-requisite: C++ or Java. This course is comparable to a first semester college course in computer science. It emphasizes programming methodology with a concentration of problem solving, algorithms, and data structures. A sound understanding of the basic skills of programming in C++ or Java is expected. A satisfactory score on the AP exam can enable the pupil to earn three or more college credits. All programs will be written in the Java language as required by the College Board.