MATHEMATICS

Program Level	Grade 9	Grade 10	Grade 11	Grade 12
Honors	Honors Integrated Math 2 A & B 38062, 38072	Honors Integrated Math 3 A & B 38082, 38092	Honors Pre-Calculus A & B 34212, 34222	AP Calculus BC A, B, & C 34312, 34322, 34323
Accelerated	Integrated Math 2 A & B 38022, 38032	Integrated Math 3 A & B 38042, 38052	Pre-Calculus A & B 33312, 33322	AP Calculus AB A, B, & C 33042, 33052, 33053 AP Statistics A & B 35002, 35012
Opportunity to Accelerate	Integrated Math 1 A, B, & C 38002, 38012, 38013	Integrated Math 2 A & B 38022, 38032 Integrated Math 3 A 38042	Integrated Math 3 B 38052 Pre-Calculus A & B 33312, 33322	AP Calculus AB A, B, & C 33042, 33052, 33053 AP Statistics A & B 35002, 35012
College Preparatory	Integrated Math 1 A, B, & C 38002, 38012, 38013	Integrated Math 2 A & B 38022, 38032	Integrated Math 3 A & B 38042, 38052	Pre-Calculus A & B 33312, 33322 Math Analysis A & B 33252, 33262 Operations Research A & B 34332, 34342 AP Statistics A & B 35002, 35012
Essential	Pre-Algebra A & B 31002, 31012	Integrated Math 1 A, B, & C 38002, 38012, 38013	Integrated Math 2 A & B 38022, 38032	Integrated Math 3 A & B 38042, 38052

The State of Michigan and Birmingham Public Schools require 4 credits in Math to include three years of an integrated sequence. All students must take one math course or a math-related course during their senior year.

MATHEMATICS

The mathematics program at Seaholm is a multi-level program with course offerings at the honors and college preparatory levels. Within the college preparatory sequence of classes, students may be accelerated. The course offerings are listed in sequential order on the flow chart. Students taking courses in one level may elect courses in a different level subject to teacher recommendation or mathematics department approval.

Students should earn a B- or better to remain in the honors or accelerated program. It is also recommended that students not elect honors or accelerated courses pass/fail. **Students should earn a C- or better to continue to the next mathematics course. The recommendation of the mathematics teacher should be the guiding factor in course selection.**

31002 Pre-Algebra A
31012 Pre-Algebra B

(½ unit of credit each)

Pre-Algebra is for students who need to strengthen their mathematical skills prior to taking Integrated Math 1. Fundamental skills of arithmetic are expanded and problem-solving skills are practiced. Elementary algebra and geometry topics, including equations, inequalities, data analysis, graphing, probability, areas, and volumes are introduced. Emphasis is placed on real-world applications and making connections to other disciplines.

Prerequisites: 8th-grade teacher recommendation

38002 Integrated Math 1 A
38012 Integrated Math 1 B
38013 Integrated Math 1 C

(½ unit of credit each)

Integrated Math 1 aims to deepen and extend student understanding built in previous courses by focusing on developing fluency with solving linear equations, inequalities, and systems. These skills are extended to solving simple exponential equations, exploring linear and exponential functions graphically, numerically, symbolically, and as sequences, and by using regression techniques to analyze the fit of models to distributions of data.

Prerequisites: 8th-grade teacher recommendation

39002 Introduction to Integrated Math 2

(½ unit of credit)

This course is intended for students new to Birmingham Public Schools who have successfully completed a traditional Algebra 1 course. Introduction to Integrated Math 2 will cover topics that were developed in Integrated Math 1 that are not typically taught in Algebra 1 courses. Topics include modeling bivariate data, sequences, triangle congruence, coordinate geometry, and exponential functions.

Prerequisites: Algebra 1 outside of BPS

38022 Integrated Math 2 A
38032 Integrated Math 2 B

(½ unit of credit each)

Integrated Math 2 aims to formalize and extend the geometry that students have learned in previous courses. It does this by focusing on establishing triangle congruence criteria using rigid motions and formal constructions and building a formal understanding of similarity based on dilations and proportional reasoning. It also helps students develop the concepts of formal proof, explore the properties of two-dimensional objects, and work within the rectangular coordinate system to verify geometric relationships. Students also use the language of set theory to compute and interpret probabilities for compound events.

Prerequisites: Integrated Math 1

38062 Honors Integrated Math 2 A
38072 Honors Integrated Math 2 B

(½ unit of credit each)

Students will investigate the same standards as regular Integrated Math 2. In Honors Integrated Math 2, these topics are developed with greater depth, breath, and rigor. A higher degree of mastery and attention to detail will be expected. Lessons and assessments may include additional questions, investigations, or projects.

Prerequisites: Integrated Math 1 and 8th-grade teacher recommendation

38042 Integrated Math 3 A
38052 Integrated Math 3 B

(½ unit of credit each)

Integrated Math 3 aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, and understanding the role of randomness and the normal distribution in drawing statistical conclusions.

Prerequisites: Integrated Math 2

38082 Honors Integrated Math 3 A
38092 Honors Integrated Math 3 B

(½ unit of credit each)

Students will investigate the same standards as regular Integrated Math 3. In Honors Integrated Math 3, these topics are developed with greater depth, breath, and rigor. A higher degree of mastery and attention to detail will be expected. Lessons and assessments may include additional questions, investigations, or projects.

Prerequisites: Honors Integrated Math 2 and teacher recommendation

33312 Pre-Calculus A
33322 Pre-Calculus B

(½ unit of credit each)

Pre-Calculus is the study of functions, analytic trigonometry, advanced algebra, analytic geometry, and limits. Special attention is given to higher degree polynomial functions, rational functions, exponential and logarithmic functions, and trigonometric functions. The graphing calculator is used to develop understanding of concepts and to aid in problem solving.

Prerequisites: Integrated Math 3 and teacher recommendation

34212 Honors Pre-Calculus A
34222 Honors Pre-Calculus B

(½ unit of credit each)

Honors Pre-Calculus is the study of functions, analytic trigonometry, advanced algebra, analytic geometry, and limits. Special attention is given to complex numbers, polar coordinates, mathematical induction, and parametric equations. The graphing calculator is used to develop understanding of concepts and to aid in problem solving throughout the course. This course moves more rapidly and studies topics in greater depth than regular Pre-Calculus.

Prerequisites: Honors Integrated Math 3 and teacher recommendation

33252 Math Analysis A
33262 Math Analysis B

(½ unit of credit each)

Math Analysis is designed for students who have completed Math 3 and are seeking a fourth-year capstone course that extends understanding of broadly useful ideas from statistics and probability, algebra and functions, and discrete mathematics that are relevant to many college majors and careers. Students explore methods for interpreting categorical data, modeling change with functions, counting methods, binomial distributions, statistical inference, and mathematics of democratic decision-making. Students who have completed the Math 1, 2, and 3 course sequence but are not pursuing Pre-Calculus in preparation for Calculus may also benefit from this course.

Prerequisites: Integrated Math 3

34332 Operations Research A
34342 Operations Research B

(½ unit of credit each)

Operations Research teaches students how to use advanced mathematics to make complicated decisions. Mathematical models are created to solve meaningful problems facing individuals, businesses, and governments. Fidelity of the models and interpretation of results will be thoroughly investigated. Extensive use of computers and graphing calculators will be made to find optimal solutions to these problems. Operations Research A will focus on deterministic (algebra-based) modeling while the Operations Research B will focus on probabilistic modeling. The two halves of this course are independent of one another, so students may elect to take either or both halves of Operations Research.

Prerequisites: Integrated Math 3

33042 AP Calculus AB A
33052 AP Calculus AB B
33053 AP Calculus AB C

(½ unit of credit each)

AP Calculus AB is the study of functions and their derivatives and integrals. Problems are explored from multiple viewpoints, including algebraic, numerical, and graphical. Graphing calculators are used extensively. Problem solving is developed throughout the course with practical applications from many disciplines included. This course prepares students to take the AB Calculus Advanced Placement examination.

Prerequisites: Pre-Calculus and teacher recommendation

34312 AP Calculus BC A
34322 AP Calculus BC B
34323 AP Calculus BC C

(½ unit of credit each)

AP Calculus BC is the study of functions, including vector and polar functions, derivatives and integrals, infinite sequences and series. Formal proofs of major theorems are presented. Problems are explored from multiple viewpoints, including algebraic, numerical, and graphing. Graphing calculators are used extensively. Problem solving is developed throughout the course, with practical applications from many disciplines included. This course prepares students to take the BC Calculus Advanced Placement examination.

Prerequisites: Honors Pre-Calculus and teacher recommendation

35002 AP Statistics A
35012 AP Statistics B

(½ unit of credit each)

The major themes of the content of Advanced Placement Statistics are exploratory analysis of data, planning a study, probability and statistical inference. Students will describe patterns and departures from patterns, plan and conduct studies, explore random phenomena using probability and simulation, estimate population parameters test hypotheses. Students use computers and graphing calculators to fit mathematical models to data, and also to produce graphs designed for statistical analysis. Students are expected to read critically and interpret problem situations described in writing, and to write reports. This course prepares students to take the Advanced Placement Statistics examination. Students opting for this course as an alternative to Pre-Calculus or Math Analysis should discuss their selection with their guidance counselor, as it may have implications for college admissions.

Prerequisites: Integrated Math 3 or teacher recommendation

3400DE Calculus 3 A
3400DE Calculus 3 B

(½ unit of credit each)

Three-dimensional analytic geometry. Vectors, vector-valued functions, motions in space, functions of several variables, partial differentiation, multiple integration, integration of vector fields, Green's Theorem, and Divergence Theorem. Dual enrollment opportunity through Lawrence Technological University, taught at Groves High School.

Prerequisites: AP Calculus BC and teacher recommendation

Math-Related Courses

There are several courses in the Business, Engineering, and Social Studies departments that are approved math related courses (not for math credit). Courses such as Accounting, Investments, and Engineering Technology are examples of math-related courses.

Math Transfer Policy

Within the first three weeks of the trimester:

- Students may transfer to a different math course during the first three weeks (15 class periods) with teacher approval. They will be graded only on subsequent work in their new course, but be responsible for all of the content of the course in terms of future tests/quizzes and the final exam.

Between three and six weeks of the trimester:

- Students may transfer to a different math course between the third and sixth weeks (16 to 30 class periods) with teacher and department head approval. The grades from their previous course will count as 30% of their trimester grade. The grades from their new course will count as 50% of their trimester grade. The final exam will count as 20% of their trimester grade. Again, students will be responsible for all of the content of the course in terms of future tests/quizzes and the final exam.

After six weeks of the trimester:

- There will be no student transfers after six weeks (31 class periods). Students may Drop/Fail from the course after six weeks.

Frequently Asked Questions

How will I know what math course to choose?
If you are coming from Derby or BCS, your eighth-grade math teacher will make the recommendation for your math course. These placements have always been extremely accurate. While at Seaholm your math teachers will explain course offerings and give advice about which course(s) to choose next.

What if I don't feel ready for Integrated Math 1?
We offer a Pre-Algebra class that can be very helpful in shoring up numeracy skills and building a strong foundation in algebraic reasoning prior to beginning the Integrated Math sequence.

What is the difference between the Accelerated and Honors math courses?
The Accelerated math courses are the same as the College Preparatory courses. Students in the Accelerated sequence are considered to be one year ahead of students in the College Preparatory sequence and will reach AP Calculus AB their senior year (opportunity to earn one semester of college calculus credit with the AP exam). The Honors math courses are not only one year ahead, but they also operate at a higher and more rigorous level, extending students' conceptual thinking and problem solving skills. These students will reach AP Calculus BC their senior year (opportunity to earn two semesters of college calculus credit with the AP exam).

What Advanced Placement (AP) classes are offered in the Math Department?

- *AP Statistics is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. This is a two-trimester course.*
- *AP Calculus AB is roughly equivalent to a first semester college calculus course devoted to topics in differential and integral calculus. This is a three-trimester course.*
- *AP Calculus BC is roughly equivalent to both first and second semester college calculus courses and extends the content learned in AB to different types of equations and introduces the topic of sequences and series. This is a three-trimester course.*

Can I make it into an AP math class if I take Integrated Math 1 in the ninth-grade?
Absolutely. Depending on your interests and achievement, you have the ability to take either AP Statistics or Calculus. AP Statistics can be taken immediately following Integrated Math 3. Pre-Calculus is a prerequisite for AP Calculus, so you would need to accelerate yourself within Seaholm's mathematics program.

How and when can I accelerate myself in the math program?
If you start ninth grade in Integrated Math 1, you can still make it to AP Calculus by your senior year. In your sophomore year, you can take Integrated Math 2 and the first half of Integrated Math 3. Then as a junior, you can finish Integrated Math 3 and take Pre-Calculus. You need to discuss this plan with your counselor when you're selecting your sophomore classes in January of ninth grade.

Do I have to take calculus?
No. Calculus is a powerful tool for certain fields and a common requirement for some majors. If you plan on pursuing a STEM-related career, then calculus will serve you well. For many other college majors and careers, probability, statistics, data analysis, quantitative reasoning, and mathematical modeling may be much more valuable and relevant tools. Not everybody needs to take calculus.

What happens if you are two or three years accelerated in math?
Students who take Honors Math 3 as a ninth-grader need to consider their four-year plan. A common path for double- and triple-accelerated students is to take Calculus 3 and Linear Algebra courses at a local college or university through a dual-enrollment arrangement. This involves you finding and taking evening classes at a nearby college campus that fit into your schedule. Another option is to take AP Statistics at Seaholm between Honors Math 3 and Honors Pre-Calculus. These two options are outlined in the table below. Your math teacher or the head of the math department can advise you about these options.

Option	9th Grade	10th Grade	11th Grade	12th Grade
Stay at Seaholm	Honors Math 3	AP Statistics	Honors Pre-Calculus	AP Calculus BC
Take classes off-campus	Honors Math 3	Honors Pre-Calculus	AP Calculus BC	Calculus 3 and Linear Algebra (Dual enrollment)