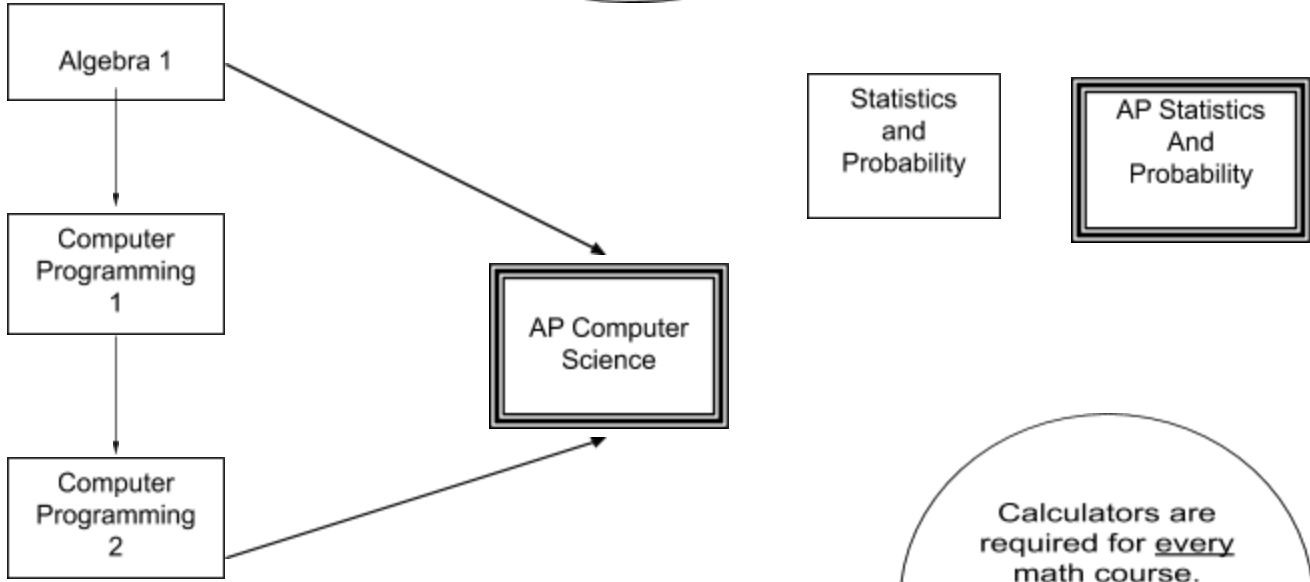


# MATHEMATICS



## ELECTIVES



Calculators are required for every math course. See the course description to determine the appropriate calculator.

**Calculator Recommendations**

Algebra 1, Geometry – TI 30x IIS  
 All courses – TI-84 Plus, Silver Edition, Plus CE  
 Consider a TI-84 if purchasing a new calculator

# MATHEMATICS

All Honors Courses require higher level thinking and problem solving ability.

Calculators are expected in all classes. Regular calculators (Example TI-30 X IIS) are required for Algebra 1, Math Extensions, and Geometry. Graphic calculators (Example TI-83, TI-84, NOT a TI-89) are used in all other classes and must be provided by the student. The School District of Greenfield cannot provide calculators for all students in all math classes. Please see your individual math teacher if you are financially unable to have a calculator for class.

## 4221 ALGEBRA 1

1 Credit

4222

●9 ○10 ○11 ○12

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in middle school. The units of study are: Relationships between quantities and reasoning with equations; Linear and exponential relationships; Descriptive statistics; Expressions and equations; Quadratic functions and modeling. Students will also be expected to use their problem solving skills to work with real world situations.

## 4331 GEOMETRY

1 Credit

4332 Prerequisites: Successful completion of Algebra 1

●9 ●10 ○11 ○12

The fundamental purpose of this course is to formalize and extend students' geometric experiences learned in middle school. There are 8 units of study covered in Geometry based on the Common Core State Standards for Mathematics. They are: constructions, rigid transformations, congruence, similarity, right triangle trigonometry, solid geometry, coordinate geometry, circles and conditional probability.

## 4411 ALGEBRA 2

1 Credit

4412 Prerequisites: Successful completion of Algebra and Geometry

●9 ●10 ●11 ●12

Building on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions, and continue to expand and hone their abilities to model situations and to solve equations, including solving equations with complex numbers and using logarithms. The units of study are: Solving Equations and Inequalities, Linear Functions, Introduction to Functions and their key features, Quadratic Functions, Polynomial Functions, Exponential and Logarithmic Functions.

## 4570 TRIGONOMETRY

.5 Credit

Recommended Prerequisites: C or better in Geometry, B or better in Algebra 1

(May be taken concurrently with Algebra 2 during the 2<sup>nd</sup> semester)

●9 ●10 ●11 ●12

This is a comprehensive trigonometry course which teaches the basics and then emphasizes trig applications. Topics include trig ratios, trig graph analysis, right triangles and oblique triangles, sum and difference identities and goes heavily into trigonometry identities and their applications for trigonometric proofs. Positive and negative angle measure is also explored along with radian measure and the unit circle.

## 4611 PRE-CALCULUS

1 Credit

4612 Recommended Prerequisites: B or better in Algebra 2 and "B" or better in Trigonometry ○9 ●10 ●11 ●12

**(Trig must be completed prior to Pre-Calculus - semester 2)**

This course prepares the student for the formal study of calculus by exploring functions in depth. Functions of all types (linear, quadratic, rational, exponential, logarithmic, and trigonometric) are studied with the help of a graphing calculator. Emphasis will be on using graphic representations as a problem solving technique. Today's technology allows the power of visualization to apply a graph to a problem situation in order to help find a solution.

## 4630 STATISTICS AND PROBABILITY

.5 Credit

Recommended Prerequisites: Successful completion of Algebra 2

○9 ●10 ●11 ●12

What are the chances? Today's world makes extensive use of statistical methods and the educated citizen should understand the fundamental ideas that are used to make decisions based on these methods. Fields such as economics, business, education, sociology, biology, medicine, etc. now require some knowledge of statistics for their effective pursuit. Fields such as math, physical sciences, engineering, etc. frequently require courses in statistics and probability. It looks like this would be a good course for almost anyone! Emphasis will be on the practical rather than the theoretical aspects. Very strong Algebra 2 students may bypass Statistics if they meet certain criteria and have instructor's consent. See your math teacher for information if you are interested in this acceleration into statistics and probability.

**4670 COMPUTER PROGRAMMING 1**.5 Credit

Prerequisites: Successful completion of Algebra 1

●9 ●10 ●11 ●12

This is a “hands on” one semester course, students will learn to program in Visual Basic on a Microsoft Windows compatible computer. Visual Basic is an object-oriented language commonly used in colleges in their introduction to programming classes. This is an elementary course and emphasis will be placed on good programming style, structure and creation of algorithms. This class has a great deal of independent work, so students should be motivated learners. Topics will include data types, sub-procedures, decision structures, and looping techniques.

**4680 COMPUTER PROGRAMING 2 C++**.5 Credit

Prerequisites: Successful completion of Computer Programming 1

●9 ●10 ●11 ●12

This course builds on topics developed in Computer Programming 1 and also has a great deal of independent work, so students should be motivated learners. Programming 2 will introduce students to the C++ programming language by creating programs run on a DOS interface. C++ is commonly used in business and industry and is compatible with the JAVA programming language. Major topics include control structures in C++ (looping), functions, arrays, string manipulation, and a discovery of the various types of computer careers.

**4711 ADVANCED PLACEMENT (AP) STATISTICS**1 Credit

4712 Recommended Prerequisites: Successful completion of Algebra 2 OR teacher recommendation ○9 ●10 ●11 ●12

The purpose of the AP course in Statistics is to introduce students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students are exposed to four broad conceptual themes:

1. Exploring Data: Describing patterns and departures from patterns
2. Sampling and Experimentation: Planning and conducting a study
3. Anticipating Patterns: Exploring random phenomena using probability and simulation
4. Statistical Inference: Estimating population parameters and testing hypotheses

Students who successfully complete the course and exam may receive credit, advanced placement or both for a one-semester introductory college statistics course. AP Statistics will be offered as a year-long course. It is expected that students who complete the AP Statistics course will seek college credit based on the results of the AP examination given in May. Very strong Algebra 2 students may bypass Statistics if they meet certain criteria and have instructor’s consent. See your math teacher for information if you are interested in this acceleration into advanced placement (AP) statistics.

**4721 ADVANCED PLACEMENT (AP) CALCULUS**1 Credit

4722 Prerequisites: Pre-calculus and Trigonometry; OR teacher recommendation

○9 ●10 ●11 ●12

This Advanced Placement course is the study of derivatives and integrals through the Fundamental Theorem of Calculus and some applications of the definite integral. This course emphasizes a conceptual understanding. Class is structured to give a multi-representational approach to calculus, with concepts, results, and problems being expressed multiple ways: geometrically, analytically, verbally, and numerically. This study corresponds to slightly more than the first semester course at many universities. Students who enroll should have demonstrated a mastery of Algebra 1 and 2, Geometry, and Pre-Calculus topics. It is expected that students who complete the course will seek college credit based on the results of the AP examination given in May.

**4741 ADVANCED PLACEMENT (AP) COMPUTER SCIENCE PRINCIPLES**1 Credit

4742

○9 ●10 ●11 ●12

Prerequisites: Successful completion of Algebra 1 and/or Computer Programming 1; OR teacher recommendation

This course is designed to be equivalent to a first semester introductory college computing course. In this course, students will develop computational thinking skills vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends. The course is unique in its focus on fostering student creativity. Students are encouraged to apply creative processes when developing computational artifacts and think creatively while using computer software and other technology to explore questions that interest them. They will also develop effective communication and collaboration skills, working individually and collaboratively to solve problems, and discussing and writing about the importance of these problems and the impacts to their community, society, and the world.