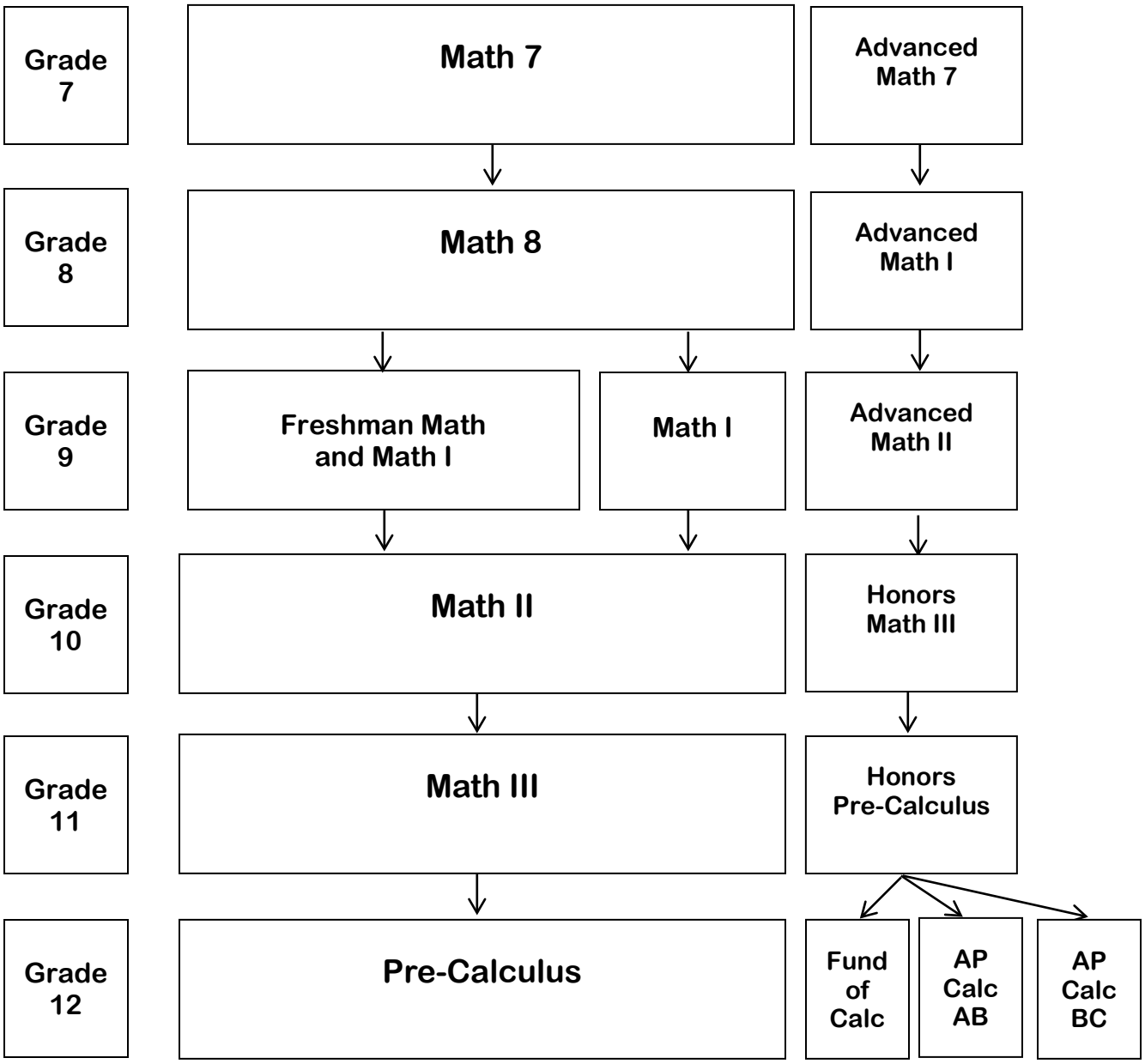
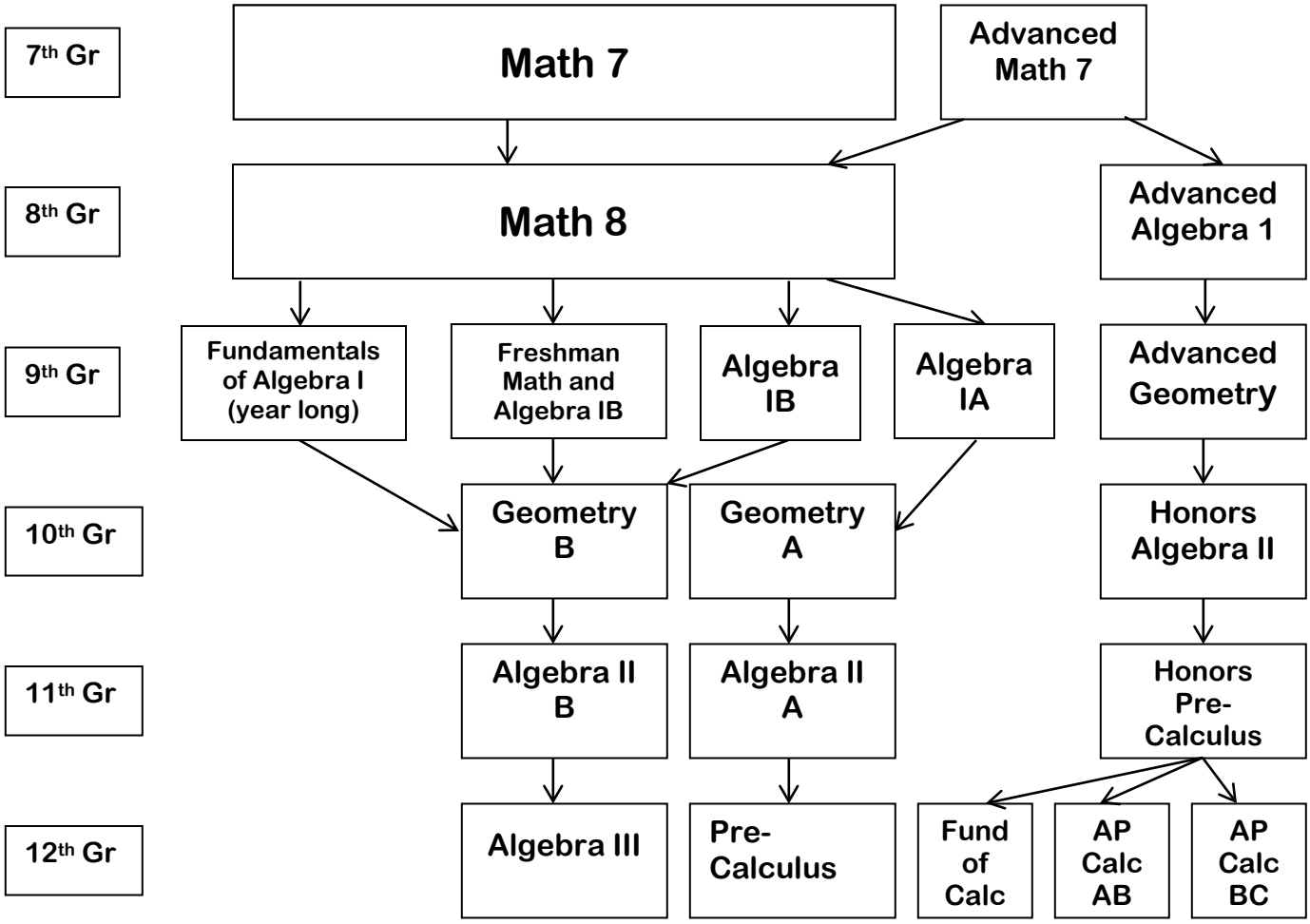
## Mathematics Flow Chart
# for Students in Grades 7, 8, and 9
### in 2012-2013



## Mathematics Flow Chart
# for Students in Grades 10, 11, and 12
### in 2012-2013




**Elective Options:**

**Statistics (18 wk math credit)**
This course is available to students who have successfully completed Algebra II.

# Mathematics

## MATH I

**10-12 1 credit 2 semesters (full year) CP $8.00**

The critical areas in this course deepen and extend understanding of linear relationships, in part by contrasting them with exponential phenomena, and in part by applying linear models to data that exhibit a linear trend. Mathematics I uses properties and theorems involving congruent figures to deepen and extend understanding of geometric knowledge from prior grades. The final unit in the course ties together the algebraic and geometric ideas studied. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations. A scientific or graphing calculator is strongly recommended for this course.

## GEOMETRY B

**10 1 credit 2 semesters (full year) B $8.00**

**(Prerequisite: Successful completion of Algebra IB)**

Students will study properties ranging from points, angles, lines and planes, to circle arcs and segments. Topics include: informal development of proof using theorems; properties of triangles and congruent triangles; and various aspects of polygons including properties of parallelograms, angle sums and similarity, and statistics. This course also explores the Pythagorean Theorem through the study of area, ratio and proportion with regards to similarity and properties of right angles extended into trigonometry. A graphing or scientific calculator is required.

## ALGEBRA IIB

**11 1 credit 2 semesters (full year) B $8.00**

**(Prerequisite: Successful completion of Geometry B )**

Various methods of problem solving using equations and inequalities are studied. Students will study quadratic equations, including different methods of solving radical equations and word problems leading to the quadratic equation. The slope of a line, the Pythagorean Theorem, the distance formula, and the midpoint formula are reviewed. The students are introduced to the fundamentals of trigonometry. They will also work with solving problems by organizing data and working various graphs. A graphing calculator, preferably TI-83 or TI-84, is highly recommended.

## ALGEBRA III

**12 1 credit 2 semesters (full year) CP $8.00**

**(Prerequisite: A grade of "C" or better in Algebra IIA or Algebra IIB/passed the Math OGT)**

Students will review linear and quadratic equations and extend them into functional notation. Building on previous algebraic knowledge, students deepen their knowledge of algebraic properties and graphical representations of lines, functions, conics, and systems of equations. Unit circle trigonometry and right triangle trigonometry, and identities are covered. Other topics include matrices, determinants, sequences, series, statistics, applications of the Binomial Theorem, estimates of area, slope, and polar coordinates. A graphing calculator, preferably TI-83 or TI-84, is required.

## GEOMETRY A

**10-11 1 credit 2 semesters (full year) CP $13.00**

**(Prerequisite: Successful completion of Algebra IA)**

This course is highly recommended for those students wishing to go to college or technical school. The course begins with the study of geometry by exploring points, lines, planes, and angles. The concept of proof is developed by using theorems about angles and congruent triangles. The postulates and theorems for perpendicular and parallel lines are dealt with. In addition, special properties of quadrilaterals are covered, as is the study of lines, planes, and space. The study of polygons is extended to cover angle sums and similarity. The Pythagorean Theorem is developed and applied. The student will study circles, exploring their radii, chords, arcs, related angles, and segments. Formulas for area and volume and the coordinate plane are combined with geometry to introduce coordinate proofs. Locus problems, inequalities, and alternate forms of proofs are covered. A scientific or graphing calculator is required.

## ALGEBRA II A

**11 1 credit 2 semesters (full year) CP $13.00**

**(Prerequisite: Successful completion of Geometry)**

This course is highly recommended for those students wishing to attend college or a technical school. Linear graphs and equations, plus polynomials and factoring, will be reinforced, with emphasis on the speed of recognition and manipulations. According to given rules, exponents, radicals, fractional equations, and complex fractions will be transformed. Relations and functions will be defined and distinguished. The student will cover the operations of polynomial and rational expressions. Rules and operations of radical expressions will be covered in detail. Complex numbers will be introduced, as well as exponential and logarithmic functions, series, sequences, probability, combinatorics, statistics, and quadratic equations. Trigonometry will be introduced, utilizing the unit circle and right triangle. A graphing calculator, preferably a TI-83 or TI-84, is required.

## PRE-CALCULUS

**12 1 credit 2 semesters (full year) CP $13.00***

**(Prerequisite: "C" or better in Algebra IIA)**

The course covers linear relations and functions, theory of equations, matrices, vectors, and circular functions. This course also covers basic definitions and trigonometric functions, proving trigonometric identities, graphs, and inverses of trigonometric functions. Applications of trigonometry, polar coordinates and complex numbers, sequences and series will be dealt with, as well as linear equations, study of probability, and descriptive statistics. A graphing calculator, preferably a TI-83 or TI-84, is required.

## HONORS ALGEBRA II

**10 1 credit 2 semesters (full year) AP/H $13.00***

**(Prerequisite: A grade of "A" or "B" in both Algebra I (in the 8th grade) and Advanced Geometry)**

This rigorous course is designed for the student intending to take Advanced Placement Calculus during their senior year. This course quickly reviews basic concepts of Geometry and Algebra I with an emphasis on writing linear equations, solving word problems and systems of equations, simplifying polynomials, rules of exponents and factoring. Students will learn how to solve absolute, radical, rational, fractional and quadratic equations through a variety of methods. Students will also learn multiple methods of solving 3 variable equations. The student will study functions, rational expressions, complex numbers, and conics in great detail. There is also an extensive trigonometry unit, including trig proofs. Technology plays a vital role in the development of the student's learning and will be used daily. Every student is required to have a graphing calculator, preferably a TI-84.

## HONORS PRE-CALCULUS

**11 1 credit 2 semesters (full year) AP/H $13.00***

**(Prerequisite: "C" or better in Adv. Algebra II)**

This accelerated course deals with operations of polynomials; expressions involving radical notation and absolute values; solving linear, quadratic, and radical equations; solving linear and quadratic inequalities; and fundamentals of functions including graphing, symmetry, transformations, and inverses. The course will also cover the study of exponential and logarithmic functions; trigonometric identities, inverse functions and equations; and triangles and vectors along with complex numbers in polar notation. Systems of equations; matrices and determinants; equations of second degree along with their graphs; and sequences, series, and probability will also be covered. A graphing calculator, preferably a TI-83 or TI-84, is required.

## FUNDAMENTALS OF CALCULUS

**12 1 credit 2 semesters (full year) CP $8.00***

**(Prerequisite: Successful completion of either Pre-AP Math 11 or Pre-calculus)**

This course extends the function concepts, especially trigonometric and vectors, covered in Pre-Calculus. Introductory Calculus concepts, such as limits and slope functions and introductory Discrete Mathematics topics will be addressed. Students will learn about derivatives, integrals, differential equations, and various applications of Calculus. A graphing calculator, preferably TI-83 or TI-84, is required.

## ADVANCED PLACEMENT CALCULUS-AB

**12 1 credit 2 semesters (full year) AP/H $8.00***

**(Prerequisite: "C" or better in Adv. Pre. Calc. or "A" in Pre-calculus or successful completion of Fundamentals of Calculus)**

In this course students will work towards the A.P. exam, but will not be required to take it. Topics covered will include the derivative and its rules applied to various functions. Applications will include extreme values, rates-of-change, and curve sketching. The student will study the anti-derivative, the definite integral, and area problems. Applications will include differential equations, volume, arc length and surface area, distance and velocity, and work. A College Board approved graphing calculator is required.

## ADVANCED PLACEMENT CALCULUS - BC

**12 2 credits 2 semesters (full year) AP/H $10.00***

**(Prerequisite: "B" or better in Adv. Pre. Calc. or permission of Department Chairperson)**

This two-term class is a broader course of AP Calculus-AB. Both terms are required. Students will prepare for the A.P. test, but will not be required to take it. The student will study the concepts of limits, the derivative and its rules as applied to various polynomial and trigonometric functions, velocity, the chain rule, implicit differentiation and Newton's method. The derivative will be used to determine extreme values of functions, curve sketching, and related rates. The student will study the anti-derivative; the definite integral; area problems; applications of the definite integral in calculating volumes, arc length and surface area; distance and velocity; and work. Also to be studied are logarithmic functions, exponential functions, the inverse trigonometric functions, vector-valued functions and functions given in parametric or polar form. The theory of infinite series will be introduced, as well as Taylor polynomials and power series. A College Board approved graphing calculator is required.

**Since the curriculum in AB Calculus is embedded throughout BC Calculus, students are not permitted to take both AP classes for credit.**

# ELECTIVE

## STATISTICS

**11-12 .5 credit 1 semester (half year) CP $8.00***

**(Prerequisite: successful completion of Algebra II)**

All students who intend to pursue mathematics, business, social science, or science fields of study in college will find this course to be of value. Topics include: probability; data presentation and collection; measures of dispersion; central tendencies; the binomial and normal distributions; and regression models. A graphing or scientific calculator is required.