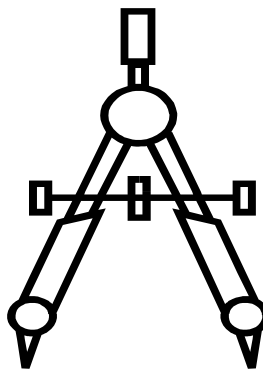


MATH



The Mathematics Department takes very seriously the idea that Cathedral Preparatory School is “college prep.” We offer a strong, fundamental program in mathematics. It is our goal to lay a solid foundation in each course for the next course which the students will take. Since our students take four years of math, this is critical. Students are placed in one of four “tracks” depending on their math scores on the placement exam, Iowa test scores, grade school achievement level and teacher recommendation. Besides the normal sequence of Algebra 1, Geometry, Algebra 2, and Pre-Calculus math, we offer the advanced student an opportunity to enter the accelerated tracks with the top track ending in AP Calculus, which is eligible for 4 college credits through the University of Pitt. Students who successfully complete courses in the accelerated math curriculum will be also able to earn college credit for some courses through Gannon University and/or the AP testing program.

MATHEMATICS

443 Algebra 1 Academic	Two Semesters
Grades: 9	Credit: 1.0
Prerequisite: None	
Algebra 1 is a course in the fundamentals of algebra. The student learns to work with algebraic equations from the standpoint of solving, graphing, and applying them to everyday situations. The course prepares the student to move into the appropriate Geometry, Algebra 2, and Senior math course.	
442 Algebra 1 Honors	Two Semesters
Grades: 9	Credit: 1.0
Prerequisite: Department Placement	
Students who demonstrate math talent and proficiency in most Algebra 1 skills will be placed in this accelerated track course. The course covers Algebra II material. Emphasis will be placed on solving challenging, non-routine problems.	
433 Geometry Academic	Two Semesters
Grades: 10	Credit: 1.0
Prerequisite: Algebra I A, Algebra I H	
This course covers the definitions, postulates, and theorems of geometry as a mathematical system. Students learn to prove and to apply theorems. Topics include congruence, similarity, polygons, circles, perpendicularity, area, and coordinate geometry. Use of algebra in the solution of geometric problems will be emphasized.	
432 Geometry Honors	Two Semesters
Grades: 9, 10	Credit: 1.0
Prerequisite: Teacher Recommendation, Algebra I A, Algebra I H	
Students will cover the topics of geometry in more depth with an emphasis on deductive reasoning and proof. A stronger emphasis is placed on logical processes using higher level algebraic skills.	
431 Accelerated Geometry	Two Semesters
Grades: 9, 10	Credit: 1.0
Prerequisite: Placement Test, Teacher Recommendation, Algebra I H	
The student is given an abstract and concrete approach to logical reasoning and geometric topics with the emphasis on algebraic applications. Emphasis is also placed on developing the student's ability to give accurate explanations on how to solve geometric problems using flow charting, indirect paragraph and formal proof.	
423 Algebra 2 Academic	Two Semesters
Grades: 11	Credit: 1.0
Prerequisite: Algebra I, Geometry	
Algebra 2 students will study the fundamental topics of algebra. Use algebraic expressions and functions model real-life situations.	
422 Algebra 2/Trigonometry Honors	Two Semesters
Grades: 10, 11	Credit: 1.0
Prerequisite: Algebra I, Geometry	
This course covers a full semester of trigonometry that is concerned with the measurement of the parts, sides, and angles of triangles restricted to triangles lying in a plane. Early applications of trigonometry are used to relate this field of mathematics to real world problems such as aviation, navigation, engineering, etc. Complex numbers are also covered in detail. Algebra 2 is covered in the second semester and expands on some of the topics covered in algebra 1 in addition to a more in-depth study of functions. Some additional topics covered are logarithms, conics, matrices, with a strong emphasis of work problems relating to the real world. Technology is incorporated into the course where appropriate.	

421 College Algebra/Trigonometry	Two Semesters
Grades: 11	Credit: 1.0
Prerequisites: Accelerated Geometry, Algebra I H	
<p>This course helps students to develop a good understanding of trigonometry through DeMoivre's Theorem and complex numbers. Throughout the course the students are exposed to connections between trigonometry and the range of real-world applications. Techniques are introduced which illustrate concepts that are used in calculus. A graphing calculator is required for this course.</p> <p>College Algebra is a second semester course designed to build a strong foundation in algebra which encourages students to develop a firm grasp of the underlying mathematical concepts while using algebra as a tool for solving real-life problems. Concepts covered include but are not limited to polynomial and rational functions, exponential and logarithmic functions, matrix algebra, determinants, sequences, series, and other concepts that prepare the student for calculus. Technology is integrated throughout the course used as a tool for visualization, investigation, and verification.</p>	
417 Finite Math & Special Topics	Two Semesters
Grades: 10, 11, 12	Credit: 1.0
Prerequisites: Algebra I H, Geometry Honors or Accelerated Geometry, College Algebra/Trigonometry	
<p>This course is designed to give students a solid background for those continuing on in calculus or looking to major in business, management, economics, or social sciences. Mathematical models for the analysis of decision-making problems are examined. Topics include the echelon method for solving linear equations, matrix manipulations, optimization by linear programming including the simplex method, risk decisions using probability, expected value and statistics. An in-depth study of conics and equations of special lines is included. Additional topics from discrete mathematics, network models, or game theory may be chosen as time permits. Technology is incorporated into this course.</p>	
416 Pre-Calculus	Two Semesters
Grades: 12	Credit: 1.0
Prerequisites: Algebra 1, Geometry, Algebra 2	
<p>This course is designed for those students who do not qualify for Calculus. Emphasis will be on functions, problem solving, trigonometry and reinforcing algebraic techniques. Final segment will introduce logarithms & work with determinants & matrices.</p>	
412 Calculus Honors	Two Semesters
Grades: 12	Credit: 1.0
Prerequisites: Algebra I, Geometry, College Algebra/College Trigonometry or Algebra 2/Trigonometry Honors	
<p>This honors course in calculus provides an indepth study of limits, differentiation and applications, and an introduction to integration.</p>	
411 Calculus AP	Two Semesters taken for (Univ. of Pittsburgh credit)
Grades: 12	Credit: 1.0 (4 college credits)
Prerequisites: Algebra I Honors, Accelerated Geometry, College Algebra/College Trigonometry	
<p>Calculus is one of the most powerful of human intellectual achievements. This course attempts to give the student an appreciation of the beauty of calculus and prepare the student to take the AP exam in May. This course covers an extensive study of limits, all rules for derivatives, their applications, integration and applications, differential equations, L'Hopital's Rule, and improper integrals. Technology is integrated throughout the entire course. A graphing calculator is required.</p>	
415 Probability & Statistics AP	Two Semesters
Grades: 10,11,12	Credit: 1.0
Prerequisite: Algebra I Honors, Accelerated Geometry, College Algebra/Trigonometry	
<p>This course introduces the student to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, planning a study, anticipating patterns, and statistical inference. The use of technology is an integral part of this course.</p>	