

Kolbe Academy Home School

HIGH SCHOOL GEOMETRY (K) HONORS GEOMETRY (H) *Geometry: A Guided Inquiry*

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COURSE TITLE: Geometry

COURSE TEXTS:

- *Geometry: A Guided Inquiry*, by G.D. Chakerian, Calvin D. Crabill, and Sherman K. Stein
- Kolbe Digital License for Accompaniment to *Geometry: A Guided Inquiry*
- GeoGebra

COURSE DESCRIPTION:

This Geometry course can follow any Algebra I program, whether the student has used Saxon Algebra I, Jacob's Elementary Algebra, or another First year Algebra course. If questions should arise about the preparedness of a student for this course, please contact the Academic Advisor department at Kolbe Academy. This course presents all the geometrical concepts in a traditional fashion to the high school student. This course will sufficiently prepare the student for questions on the math section of the PSAT, ACT, or SAT standardized tests. Students completing this course as well as a previous Algebra I program will be ready to take the traditional second year of Algebra II. Student's who wish to continue on in the Saxon mathematics series upon completion this Geometry course will find much repetition in the Saxon Algebra II course because the majority of the material covered is Geometry. Students choosing to continue with Saxon after this course should be prepared to take through Advanced Mathematics I in order to complete all the Algebra II concepts necessary to succeed on the ACT and SAT standardized tests. It is more desirable for students to pursue a traditional Algebra II course following this Geometry course. The Kolbe Academy recommended course of study includes continuing with Foerster's Algebra and Trigonometry upon completion of the *Geometry: A Guided Inquiry* text.

The *Geometry: A Guided Inquiry* text includes engaging language that will help to keep the interest of the student throughout the duration of the course. The lessons are set up to challenge students, yet offer sound explanations to give students the tools to complete problems efficiently. The text is set up with a Central Problem that allows for learning through discovery, Review Exercises that check for understanding, and Projects that expand and enhance the material covered. Finally, Algebra reviews are located at the end of several chapters in the student textbook.

SCOPE AND SEQUENCE:

- Conditional statements
- Direct and indirect proofs
- Pythagorean theorem
- Lines and Angles
- Congruence
- Parallel Lines
- Parallelograms
- Transformations
- Area, Surface Area, and Volume
- Similarity
- The Right Triangle
- Introduction to Trigonometry
- Circles
- The Concurrence Theorems
- Regular polygons
- Geometric solids
- Conic Sections (Honors Only)

DIPLOMA REQUIREMENTS:

Summa Cum Laude diploma candidates are required to follow either the Kolbe Core course (K) or Kolbe Honors course (H) track outlined in this course plan. **Magna Cum Laude** and **Standard** diploma candidates may choose to pursue the (H) or (K) designation, but are not required to do so, and instead have the option of altering the course plan as they choose. **Summa** students must complete 4 years of mathematics during their high school course of study including Algebra I, Geometry, Algebra II, and Pre-Calculus (or higher). **Magna** students must complete 3 years of mathematics during their high school course of study including Algebra I, Geometry, and Algebra II (or higher). **Standard** diploma students must complete 2 years of mathematics including Algebra I. Please see below for specific course titles, semester reporting requirements and transcript designations for Geometry (K) and Honors Geometry (H).

SEMESTER REPORTING REQUIREMENTS:

Designation*		K	H
Course Title	Geometry	Geometry	Honors Geometry
Semester 1	Any TWO samples of written and graded work from First Semester.	1) Completed First Semester Core Midterm 2) Completed First Semester Core Exam	1) Completed First Semester Honors Midterm 2) Completed First Semester Honors Exam
Semester 2	Any TWO samples of written and graded work from Second Semester.	3) Completed Second Semester Core Midterm 4) Completed Second Semester Core Exam	1) Completed Second Semester Honors Midterm 2) Completed Second Semester Honors Exam

*Designation refers to designation type on transcript. K designates a Kolbe Academy Core course. H designates a Kolbe Academy Honors course.

If the student wishes to have the course distinguished on the transcript with a (K) as a Kolbe Academy Core course or with an (H) as a Kolbe Academy Honors course, please be sure to send the correct exams and components each semester for verification as specified above. **If no designation on the transcript is desired, parents may alter the lesson plan and any written sample work is acceptable to receive credit for the course each semester.** If you have any questions regarding what is required for the (K) or (H) designations or diploma type status, please contact the academic advisory department at 707-255-6499 ext. 5 or by email at advisors@kolbe.org.

COURSE PLAN "AT A GLANCE" OUTLINE:

Core Geometry (K)

Semester 1

- Weeks 1-8: Chapters 1 – 3
- Week 9: First Semester Midterm
- Weeks 10-17: Chapters 4 and 5, Transformations
- Week 18: First Semester Exam

Semester 2

- Weeks 1-9: Chapters 6 to 8 and Trigonometric Supplement

Honors Geometry (H)

Semester 1

- Weeks 1-8: Chapters 1 – 3
- Week 9: First Semester Midterm
- Weeks 10-17: Chapters 4, 5 & 11, and Transformations
- Week 18: First Semester Exam

Semester 2

- Weeks 1-9: Chapters 6 to 8 and Trigonometric Supplement

Week 10: Second Semester Midterm Exam
Weeks 11-17: Chapters 9 to 11
Week 18: Second Semester Exam

Week 10: Second Semester Midterm Exam
Weeks 11-17: Honors Trigonometric Supplement,
Chapters 9, 10 & 12
Week 18: Second Semester Exam

Please note that a few chapters are not covered in their entirety, while others have supplemental material. Be sure to refer to the course plan that follows for specific guidance.

COURSE PLAN METHODOLOGY:

Mastery in mathematics is achieved through constant practice, so these course plans are written such that math is visited everyday (5 days/week). It is recommended that students keep to a 5 day/week schedule with mathematics despite the scheduling of their other courses.

Each chapter is designed with a Central Problem that allows for the student to learn the topics through a process of self discovery. The Central Problem should be work through at the pacing described in the lesson plan. Students can check for understanding using the answer keys provided in the Home Study Companion. Additional exercises have been supplemented by the course plan for areas that need more attention for the long term mathematical progress.

Each chapter also includes Review Exercises. Once the student has worked through the central problem, they have the ability to check for understanding by completing these problem sets. Answers to the problems are included in the Home Study Companion. Students can check their answers to determine whether they have understood the methodology of the problem. Most chapters also have a review provided with this curriculum. If additional work is needed, students may want to complete more independent and study and practice through other sources.

Two sets of comprehensive **Exams** are included in the course plan: one set for Kolbe Core (K) students and a second set for Kolbe Honors (H) students to be taken at mid-term and the end of the semester. A full two hours should be allotted for the student to complete Kolbe Academy's Mid-Semester and Semester Exams.

The **GeoGebra Supplement** is written into the course plan as it corresponds with the appropriate sections. While it isn't absolutely essential for students to learn how to use the program, knowledge of program will be beneficial when using the Home Study Companion for the course. In addition, the process of exploration that the program provides will allow for a better understanding of the material. Students need to know how to construct objects on using a compass and a straight-edge (as focused upon throughout the text, especially Chapter 5), but it is very useful to use the program and eliminate human error in the study of shapes and their properties.

◆◆◆ FIRST SEMESTER ◆◆◆

WEEK 1			
Geometry (K)		Honors Geometry (H)	
◆◆◆ Chapter 1 ◆◆◆		◆◆◆ Chapter 1 ◆◆◆	
Algebra Review		Algebra Review	
Pages 24-26: 5 - 8		Pages 24-26: 5 - 8	
Material to Cover		Material to Cover	
<ul style="list-style-type: none"> • Research Euclid and the start of Geometry. Emphasize the use of undefined terms. • Topics for the week: Point, Line, Plane, Ray, Angle, Types of Angles (Acute, Right, Obtuse Straight), Perpendicular Lines, Reflection • Know how to reflect a point across a line and calculate the distance between a point and a line. • Introduction to the GeoGebra Software: http://www.geogebra.org/book/intro-en.pdf 		<ul style="list-style-type: none"> • Research Euclid and the start of Geometry. Emphasize the use of undefined terms. • Topics for the week: Point, Line, Plane, Ray, Angle, Types of Angles (Acute, Right, Obtuse Straight), Perpendicular Lines, Reflection • Know how to reflect a point across a line and calculate the distance between a point and a line. • Introduction to the GeoGebra Software: http://www.geogebra.org/book/intro-en.pdf 	
Assignments		Assignments	
Student Text: Central Problem	Pages 1-7: 1-10	Student Text: Central Problem	Pages 1-7: 1-10
GeoGebra Website	Pages 7 – 19 : Section 1 of Introduction to GeoGebra	GeoGebra Website	Pages 7 – 19 : Section 1 of Introduction to GeoGebra
Student Text: Review Exercises	Pages 17-19: Problems 1-5	Student Text: Review Exercises	Pages 17-19: Problems 1-6
Student Text: Projects	None	Student Text: Projects	Pages 21-22: Projects 2 & 3
Home Study Companion	<ul style="list-style-type: none"> • Chapter 1 Central Problem Solutions • Chapter 4 Extension: More on Proofs, Pages 1 & 2 • Chapter 3: 5a:Notation Notes 	Home Study Companion	<ul style="list-style-type: none"> • Chapter 1 Central Problem and Project Solutions • Chapter 4 Extension: More on Proofs, Pages 1 & 2 • Chapter 3: 5a:Notation Notes
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Notes</div>			

WEEK 2			
Geometry (K)		Honors Geometry (H)	
◆◆◆ Chapter 1 ◆◆◆		◆◆◆ Chapter 1 ◆◆◆	
Algebra Review		Algebra Review	
Pages 26-27: 9 - 12		Pages 26-27: 9 - 12	
Material to Cover		Material to Cover	
<ul style="list-style-type: none"> • Topics for the week: Reflection, Perpendicular Lines, Distance from a point to a line, The Triangle Inequality Theorem, Vertical Angles Theorem, Angle of Approach and Leaving • Review how to reflect a point across a line and calculate the distance between a point and a line. • Review and assess Chapter 1 		<ul style="list-style-type: none"> • Topics for the week: Reflection, Perpendicular Lines, Distance from a point to a line, The Triangle Inequality Theorem, Vertical Angles Theorem, Angle of Approach and Leaving • Review how to reflect a point across a line and calculate the distance between a point and a line. • Review and assess Chapter 1 	
Assignments		Assignments	
Student Text: Central Problem	Pages 7-13: 11-12, 15-21	Student Text: Central Problem	Pages 7-13: 11-23
Student Text: Review Exercises	Pages 17-19: Problems 8-11	Student Text: Review Exercises	Pages 17-19: Problems 8-11
Student Text: Projects	Page 22: Project 3	Student Text: Projects	Pages 23: Project 5
Student Text: Review Self Test	Page 20: 1 – 3	Student Text: Review Self Test	Page 20: 1 – 3
Home Study Companion	<ul style="list-style-type: none"> • Chapter 1 Central Problem and Project Solutions • Chapter 1 Review Video • From Chapter 3: Study 5a-Notation Notes 	Home Study Companion	<ul style="list-style-type: none"> • Chapter 1 Central Problem and Project Solutions • Chapter 1 Review Video • From Chapter 3: Study 5a-Notation Notes
Assessment	Chapter 1 TEST	Assessment	Chapter 1 TEST
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Notes</div>			