Syllabus for Geometry – Semester 2

Course Number: **153002**

Course Title: **Geometry Semester 2**

Communications

All communication with your teacher will be through the utilization of electronic tools such as email and discussion boards. Your assignments will be submitted directly into the Blackboard Learning Management System. You will receive a Welcome email from your teacher when your course is ready for you. You may email your teacher at any time with questions that you might have.

Course Description

The Geometry course is a comprehensive look at the study of geometric concepts including the basic elements of geometry, proofs, parallel and perpendicular lines, the coordinate plane, triangles, quadrilaterals, polygons, circles, trigonometry, congruence and similarity, surface area, volume and transformations.

Course Objectives and Student Learning Outcomes

Students who successfully complete the course will be able to:

1. Identify and apply the properties of rays and angles.
2. Identify and apply the properties of parallel and perpendicular lines.
3. Write conditional statements.
4. Write proofs.
5. Write and graph linear functions.
6. Identify and apply the properties of triangles.
7. Identify and apply the properties of quadrilaterals.
8. Identify and apply the properties of polygons.
9. Identify and apply the properties of circles.
10. Prove figures are congruent.
11. Prove figures are similar.
12. Apply transformations to various figures.

Prerequisites

None

Technical Requirements

Browsers:

Internet Explorer 8 or 9 (Windows) (Must not be in compatibility mode)

Safari 4 or higher (Mac OSX)

Firefox Extended Support Release (ESR) is recommended for stability, but both the ESR and final release channel are supported (both Mac and Windows)

Google Chrome stable channel (Windows only - not supported on Mac at this time due to Java incompatibility)

The following requirements must also be met:

	Popup blocking must be disabled **JavaScript must be enabled**
Operating Systems:	Microsoft Windows XP or higher (Vista, 7) Macintosh OS X 10.5 or higher (10.6, 10.7)
RAM:	512MB or higher
Resolution:	1024 X 576 or higher
Media:	Soundcard and Speakers/Headphones Microphone required for certain courses
Plugins:	Sun Java 7 Flash Player Version 10 or higher QuickTime Version 7 or higher Real Player required for certain courses Jaws 11 or higher (for accessibility)

Course Materials

Software: Whiteboard and GCalc

During the course of this class, you will be asked to submit assignments that require graphing. If you have access to a scanner, you can draw your graphs by hand and then submit them through the dropbox. If you do not have a scanner, we have provided the Whiteboard graphing utility for your use.

It is also advised that you have a graphing calculator for this course, but it is not required. A program called Gcalc will be available to you throughout the course. You can also find the free graphing program online at GCalc - Java Mathematical Graphing System. Choose "Gcal 2 Applet" in order to see the graphing utility.

The following is what you will see throughout the course when you open GCalc. It has been embedded into the course.

You can then choose from one of the following plugins.

- Graph Plugin: Allows you to graph a linear, quadratic, square root, etc. function.
- Inequalities Plugin: Allows you to graph inequalities.
- Implicit Function Plugin: Allows you to graph functions in terms of x and y.
- Polar Graph Plugin: Allows you to graph polar functions.
- Parametric Graph Plugin: Allows you to graph parametric functions.
- Table Plugin: Allows you to enter data into a table form.

Course Management Policies

The instructor adapts to the district IEP whenever instructionally and technically possible.

As a first step in collecting all of the information that is needed to work with each student effectively, we ask that the student, or the receiving district site coordinator on the student's behalf, log onto the website and complete the online registration process. Please complete this registration process as soon as possible to allow time to set up the course and send the student the information to access it and begin working.

Academic Integrity/Copyright Policy

Academic integrity violations, plagiarism, and copyright violations will not be tolerated. The Introductory Unit of your course will teach you the details of PISD's expectations on such topics. Your teacher will utilize plagiarism check tools throughout the course.

Online Etiquette ("Netiquette")

Netiquette is meant to help you communicate professionally and effectively in an online collaborative setting. Students will follow all guidelines relating to internet etiquette and will communicate respectfully with all people. The Introductory Unit of your course will teach you the details of PISD's expectations on such topics. Your course will contain discussion boards, journals, blogs, and/or wikis where your "netiquette" is important.

Privacy Policy

Plano ISD's FERPA policy may be found at http://pol.tasb.org/Policy/Code/312?filter=FL

Grading and Evaluation (NS C.7)

The Geometry course has a total of 1870 possible points. The student's grade will be calculated by dividing the total number of points that he/she earns, divided by 1870. Example: if the student accumulates 1705 points throughout the course, his/her grade will be:

1705 ÷ 1870 = 0.912; This yields a grade of 91%.

Assessments

All courses contain a number of self-assessments (allowing the student to gauge his/her understanding of the material before proceeding to a graded assessment). Graded assessments include quizzes as well as exams.

Class Participation

Every student will have a specific schedule for completing and submitting assignments and tests. Students are required to adhere to their schedule. Students must maintain consistent email communication with their teacher. Students must complete the discussion assignments and collaborative activities throughout the course. Students who are not adhering to their course schedule, or students who are not maintaining the basic requirements of participation, such as maintaining email communication with their teacher, may be dropped from the course.

Grading Scale

90 – 100 = A

80 – 89 = B

70 – 79 = C

Below 70 – Not Passing

Drop Policy

Students may choose to drop the course within 15 days from their start date without penalty. Notify your school's/district's site coordinator to have him/her indicate such a drop situation to TxVSN.

Unit	Course Content and Assignments
Unit 6	**Similarity** **Unit Objectives** 1. Identify and use the properties of proportions 2. Apply ratios and proportions to solve problems 3. Identify similar triangles using the Angle-Angle Similarity 4. Identify similar triangles using the Side-Side-Side Similarity 5. Identify similar triangles using the Side-Angle-Side Similarity 6. Prove two polygons are similar 7. Use similarity of polygons to solve problems 8. Use ratios to find perimeter and area of similar polygons 9. Apply similarity of polygons to real world applications **Assignments** Section A: Ratios and Proportions • Section Warm-Up • Example: Ratios of Side Lengths in a Quadrilateral • Think and Click: Ratios • Example: Comparing Proportions • Multiple Choice: Solving Proportions • Tutorial: Setting Up Proportions • Flashcards: Proportions • Writing Assignment: Converting a Recipe Section B: Similar Triangles • Section Warm-Up • Example: Similar Triangles • Example: Using Similar Triangles to Find Shadow Lengths • Flashcards: Similar Triangles • Example: Similarity Postulates • Multiple Choice: Similarity Postulates • Side Splitter Theorem Examples Section C: Similar Polygons • Section Warm-Up • Example: Similar Polygons

Unit	Course Content and Assignments
	• Flashcards: Similar Polygons • Example: Perimeter and Area of Similar Polygons • Flashcards: Perimeter and Area of Similar Polygons • Example: Using Similar Polygons in Billiards • Think and Click: Similar Polygons in Real World Problems • Writing Assignment: Similar Polygons **Assessments** • Writing Assignment: Converting a Recipe (50) • Ratios and Proportions Quiz (20) • Similarity Quiz (30) • Similarity Postulates Quiz (30) • Similar Triangles Quiz (22) • Similar Polygons Definitions Perimeter and Area Quiz (30) • Writing Assignment: Similar Polygons (50) • Similar Polygons Quiz (20) • Similarity Unit Exam (100) **Discussion** Math Tutoring Lab – The Math Tutoring Lab is a discussion that can be found in each unit. Visit the Math Tutoring Lab and post any content related questions for your teacher or for the other students in the course. Please monitor the discussion on a daily basis and answer questions when you can. Use this tool as often as possible and work together to understand the content.
Unit 7	**Circles** **Unit Objectives** 1. Define and use the properties of radii and diameters of a circle 2. Define and apply theorems about chords of circles to solve problems 3. Define and apply theorems about secants of circles to solve problems 4. Define and apply the theorems about tangents of circles to solve problems 5. Apply properties of arcs to solve problems 6. Apply properties of central angles to solve problems 7. Apply properties of inscribed angles to solve problems 8. Apply properties of angles made by chords, secants and tangents in circles to solve problems 9. Write the standard equation of a circle 10. Write the equation of a transformed circle

Unit	Course Content and Assignments
	11. Graph circles on a coordinate plane 12. Find the circumference of a circle 13. Find the area of circle 14. Find the arc length of a circle 15. Find the area of a sector of a circle **Assignments** Section A: Special Segments in Circles • Section Warm-up: Crossword Puzzle • Tutorial: Properties of Chords • Think and Click: Properties of Chords • Example: Properties of Secants • Think and Click: Properties of Secants • Example: Properties of Tangents • Example: Lengths of Secants and Tangents • Flashcards: Properties of Secants and Tangents • Tutorial: Constructing Circles • Tutorial: Constructing Regular Polygons • Tutorial: Constructing Tangents Section B: Special Angles and Arcs in Circles • Think and Click: Section Warm-up • Example: Central Angles • Example: Inscribed Angles • Flashcards: Angles and Arcs • Tutorial: Angles made by Lines Intersecting Outside a Circle • Think and Click: Angles made by Chords, Secants and Tangents Section C: Equations of a Circle • Think and Click: Section Warm-up • Example: Equation of a Circle Given the Center and One Point • Matching: Equations of a Circle • Example: Graph a Circle • Think and Click: Graphs of Circles • Written Assignment: Graphing a Circle

Unit	Course Content and Assignments
	Section D: Circumference and Area of a Circle • Think and Click: Section Warm-up • Example: Finding the Circumference Given the Area of a Circle • Example: Finding the Circumference and Area Given the Equation of a Circle • Flashcards: Circumference and Area of a Circle • Example: Arc Length and Area of a Sector • Think and Click: Arc Length and Area of a Sector **Assessments** • Chords and Secants in Circles Quiz (30) • Special Segments in Circles Quiz (26) • Angles and Arcs Short Answer Quiz (30) • Special Angles and Arcs in Circles Quiz (20) • Writing the Equation of a Circle Short Answer Quiz (30) • Writing Assignment: Graphing a Circle (50) • Equations of a Circle Quiz (20) • Arc Length and Area of a Sector of a Circle Quiz (36) • Circumference and Area of a Circle Quiz (20) • Circles Unit Exam (100) **Discussion** Math Tutoring Lab – The Math Tutoring Lab is a discussion that can be found in each unit. Visit the Math Tutoring Lab and post any content related questions for your teacher or for the other students in the course. Please monitor the discussion on a daily basis and answer questions when you can. Use this tool as often as possible and work together to understand the content.
Unit 8	**Right Triangles and Trigonometry** **Unit Objectives** 1. Identify the parts of a right triangle 2. Apply the Pythagorean Theorem to solve problems 3. Identify and apply the sine ratio 4. Identify and apply the cosine ratio 5. Identify and apply the tangent ratio 6. Identify and apply the cosecant ratio 7. Identify and apply the secant ratio 8. Identify and apply the cotangent ratio

Unit	Course Content and Assignments
	9. Apply the identities of trigonometric ratios to solve problems 10. Graph the sine function 11. Graph the cosine function 12. Graph the tangent function 13. Apply the Law of Sines to solve problems 14. Apply the Law of Cosines to solve problems **Assignments** Section A: Review of the Pythagorean Theorem • Think and Click: Section Warm-up • Example: Using the Pythagorean Theorem to Find Distance • Flashcards: Pythagorean Theorem Section B: Ratios of Right Triangles • Think and Click: Section Warm-up • Think and Click: Parts of a Right Triangle • Tutorial: The Sine, Cosine and Tangent Functions • Example: Sine, Cosine and Tangent of 60 and 45 Degrees • Flashcards: Sine, Cosine and Tangent • Flashcards: Cosecant, Secant and Cotangent • Think and Click: Sine and Cosine Relationship • Think and Click: Evaluate Trigonometric Expressions with Your Calculator • Example: Trigonometric Ratios in Real-Life Problems • Flashcards: Trigonometric Ratios in Real-Life Problems Section C: Graphing Trigonometric Functions • Think and Click: Section Warm-up • Tutorial: Graphing the Sine Function • Example: Graphing the Tangent Function • Written Assignment: Graphing the Cosine Function • Multiple Choice: Graphs of Sine, Cosine and Tangent Section D: Law of Sines and Law of Cosines • Think and Click: Section Warm-up • Example: Law of Sines

Unit	Course Content and Assignments
	• Flashcards: Law of Sines • Law of Sines Quiz • Example: Law of Cosines • Flashcards: Law of Cosine **Assessments** • Review of the Pythagorean Theorem Quiz (20) • Trigonometric Ratios Short Answer Quiz (30) • Ratios of Right Triangles Quiz (22) • Writing Assignment: Graphing the Cosine Function (50) • Graphs of Sine, Cosine and Tangent Quiz (30) • Graphing Trigonometric Functions Quiz (20) • Law of Sines Quiz (30) • Law of Cosines Quiz (30) • Law of Sines and Law of Cosines Quiz (22) • Right Triangles and Trigonometry Unit Exam (100) **Discussion** Math Tutoring Lab – The Math Tutoring Lab is a discussion that can be found in each unit. Visit the Math Tutoring Lab and post any content related questions for your teacher or for the other students in the course. Please monitor the discussion on a daily basis and answer questions when you can. Use this tool as often as possible and work together to understand the content.
Unit 9	**Surface Area and Volume** **Unit Objectives** 1. Find the surface area of a prism 2. Find the surface area of a cylinder 3. Find the volume of a prism 4. Find the volume of a cylinder 5. Find the surface area of a pyramid 6. Find the surface area of a cone 7. Find the volume of a pyramid 8. Find the volume of a cone 9. Find the surface area of a sphere 10. Find the volume of a sphere

Unit	Course Content and Assignments
	Assignments Section A: Surface Area and Volume of Prisms and Cylinders • Think and Click: Section Warm-up • Flashcards: Drawing the Surfaces of a Three-Dimensional Figure • Example: Surface Area of a Cylinder • Example: Surface Area of a Triangular Prism • Flashcards: Finding the Surface Area of Prisms and Cylinders • Example: Volume of a Cylinder • Example: Volume of a Triangular Prism • Flashcards: Finding the Volume of Prisms and Cylinders • Think and Click: Rearranging Formulas • Written Assignment: Surface Area and Volume of Objects Section B: Surface Area and Volume of Pyramids and Cones • Think and Click: Section Warm-up • Flashcards: Drawing and Labeling the Sides of Pyramids and Cones • Example: Surface Area of a Pyramid • Flashcards: Surface Area of Pyramids and Cones • Example: Volume of a Cone Flashcards: Volume of Pyramids and Cones Section C: Surface Area and Volume of Spheres • Think and Click: Section Warm-up • Example: Finding the Volume of a Sphere Given the Surface Area • Flashcards: Surface Area and Volume of Spheres • Written Assignment: Surface Area and Volume of Spherical Objects **Assessments** • Prisms and Cylinders Short Answer Quiz (30) • Written Assignment: Surface Area and Volume of Object (50) • Surface Area and Volume of Prisms and Cylinders Quiz (22) • Pyramids and Cones Short Answer Quiz (27) • Surface Area and Volume of Pyramids and Cones Quiz (22) • Spheres Short Answer Quiz (30)

Unit	Course Content and Assignments
	• Written Assignment: Surface Area and Volume of Spherical Objects (50) • Surface Area and Volume of Spheres Quiz (22) • Surface Area and Volume Unit Exam (100) **Discussion** Math Tutoring Lab – The Math Tutoring Lab is a discussion that can be found in each unit. Visit the Math Tutoring Lab and post any content related questions for your teacher or for the other students in the course. Please monitor the discussion on a daily basis and answer questions when you can. Use this tool as often as possible and work together to understand the content.
Unit 10	**Transformations** **Unit Objectives** 1. Apply translations to geometric figures 2. Apply reflections to geometric figures 3. Apply rotations to geometric figures 4. Apply dilations to geometric figures **Assignments** Section A: Translations and Reflections • Think and Click: Section Warm-up • Think and Click: Translations • Flashcards: Reflections on the Coordinate Axis • Think and Click: Lines of Symmetry Section B: Rotations and Dilations • Think and Click: Section Warm-up • Think and Click: Rotations • Flashcards: Dilations • Example: Dilations and Distance and Slope • Example: Dilations and Transformations • Tessellations Written Assignment **Assessments** • Translations and Reflections Short Answer Quiz (28) • Translations and Reflections Quiz (20) • Rotations and Dilations Short Answer Quiz (27) • Writing Assignment: Tessellations (50)

Unit	Course Content and Assignments
	• Rotations and Dilations Quiz (24) • Transformations Unit Exam (100) **Discussion** Math Tutoring Lab – The Math Tutoring Lab is a discussion that can be found in each unit. Visit the Math Tutoring Lab and post any content related questions for your teacher or for the other students in the course. Please monitor the discussion on a daily basis and answer questions when you can. Use this tool as often as possible and work together to understand the content.
Final Exam	**Semester 2 Exam (200)**

§111.41. Geometry, Adopted 2012 (One Credit).

(a) General requirements. Students shall be awarded one credit for successful completion of this course. Prerequisite: Algebra I.

(b) Introduction.

(1) The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on fluency and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

(2) The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, paper and pencil, and technology and techniques such as mental math, estimation, and number sense to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(3) In Geometry, students will build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I to strengthen their mathematical reasoning skills in geometric contexts. Within the course, students will begin to focus on more precise terminology, symbolic representations, and the development of proofs. Students will explore concepts covering coordinate and transformational geometry; logical argument and constructions; proof and congruence; similarity, proof, and trigonometry; two- and three-dimensional figures; circles; and probability. Students will connect previous knowledge from Algebra I to Geometry through the coordinate and transformational geometry strand. In the logical arguments and constructions strand, students are expected to create formal constructions using a straight edge and compass. Though this course is primarily Euclidean geometry, students should complete the course with an understanding that non-Euclidean geometries exist. In proof and congruence, students will use deductive reasoning to justify, prove and apply theorems about geometric figures. Throughout the standards, the term "prove" means a formal proof to be shown in a paragraph, a flow chart, or two-column formats. Proportionality is the unifying component of the similarity, proof, and trigonometry strand. Students will use their proportional reasoning skills to prove and apply theorems and solve problems in this strand. The two- and three-dimensional figure strand focuses on the application of formulas in multi-step situations since students have developed background knowledge in two- and three-dimensional figures. Using patterns to identify geometric properties, students will apply theorems about circles to determine relationships between special segments and angles in circles. Due to the emphasis of probability and statistics in the college and career readiness standards, standards dealing with probability have

been added to the geometry curriculum to ensure students have proper exposure to these topics before pursuing their post-secondary education.

(4) These standards are meant to provide clarity and specificity in regards to the content covered in the high school geometry course. These standards are not meant to limit the methodologies used to convey this knowledge to students. Though the standards are written in a particular order, they are not necessarily meant to be taught in the given order. In the standards, the phrase "to solve problems" includes both contextual and non-contextual problems unless specifically stated.

(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

Knowledge and Skills	Student Expectations	Bloom's Level		TEKS Alignment Evidence
		Guideline	Observed	
(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:				
	(A) apply mathematics to problems arising in everyday life, society, and the workplace;	Apply	Apply	Sem. 2 – Unit 2 – Lesson 2.08 Surface Area and Volumes of Pyramids – Part 2 Sem. 2 – Unit 4 – Lesson 4.15 - Circles in the Coordinate Plane – Part 3
	B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;	Evaluate	Evaluate	Sem. 1 – Unit 2 – Lesson 2.09 – Algebraic Logic, Part 2
	(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;	Apply	Apply	Sem. 1 – Unit 1 - 1.04 Measuring Length, Part 1 Sem. 1 – Unit 1 - 1.11 Relationships Between Triangles and Circles, Part 1 Sem. 2 – Unit 6 - 6.06 Topology
	D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;	Understand	Understand	Sem. 1 – Unit 1 - 1.15 Using Algebra to Describe Geometry, Part 1 Sem. 1 – Unit 1 - 1.16 Using Algebra to Describe Geometry, Part 2 Sem. 2 – Unit 6 - 6.05 Discuss: Graph Theory
	(E) create and use representations to organize, record, and communicate mathematical ideas;	Create	Create	Sem. 1 – Unit 2 - 2.09 Algebraic Logic, Part 2 Sem. 1 – Unit 5 - 5.14 Proofs and Coordinate Geometry, Part 2
	(F) analyze mathematical relationships to connect and communicate mathematical ideas; and	Analyze	Analyze	Sem. 2 – Unit 6 - 6.10 Projective Geometry
	(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	Evaluate	Evaluate	Sem. 1 – Unit 2 - 2.05 Discussion: Reasoning and Argument Sem. 1 – Unit 2 - 2.09 Algebraic Logic, Part 2

(2) Coordinate and transformational geometry. The student uses the process skills to understand the connections between algebra and geometry and uses the one- and two-dimensional coordinate systems to verify geometric conjectures. The student is expected to:				
	(A) determine the coordinates of a point that is a given fractional distance less than one from one end of a line segment to the other in one- and two-dimensional coordinate systems, including finding the midpoint;	Apply	Apply	Sem. 1 – Unit 1 - 1.04 Measuring Length, Part 1 Sem. 1 – Unit 3 - 3.18 Slope, Part 2
	(B) derive and use the distance, slope, and midpoint formulas to verify geometric relationships, including congruence of segments and parallelism or perpendicularity of pairs of lines; and	Analyze	Analyze	Sem. 1 – Unit 3 - 3.18 Slope, Part 2 Sem. 1 – Unit 5 - 5.12 Using the Distance Formula
	(C) determine an equation of a line parallel or perpendicular to a given line that passes through a given point.	Apply	Apply	Sem. 1 – Unit 3 – 3.19 Graphing the Equation of a Line Sem. 1 – Unit 3 – 3.19 Writing Assignment: Writing Linear Equations
(3) Coordinate and transformational geometry. The student uses the process skills to generate and describe rigid transformations (translation, reflection, and rotation) and non-rigid transformations (dilations that preserve similarity and reductions and enlargements that do not preserve similarity). The student is expected to:				
	(A) describe and perform transformations of figures in a plane using coordinate notation;	Apply	Apply	Sem. 2 – Unit 1 - 1.15 Unit 1 Test, Part 2 Sem. 2 – Unit 3 - 3.02 Dilations and Scale Factors, Part 2
	(B) determine the image or pre- image of a given two-dimensional figure under a composition of rigid transformations, a composition of non-rigid transformations, and a composition of both, including dilations where the center can be any point in the plane;	Apply	Apply	Sem. 1 – Unit 1 - 1.16 Using Algebra to Describe Geometry, Part 2 Sem. 2 – Unit 3 - 3.01 Dilations and Scale Factors, Part 1
	(C) identify the sequence of transformations that will carry a given pre-image onto an image on and off the coordinate plane; and	Apply	Apply	Sem. 1 – Unit 1 - 1.14 Transformations, Part 2 Sem. 1 – Unit 1 – 1.14 Writing Assignment Sem. 1 – Unit 1 - 1.16 Using Algebra to Describe Geometry, Part 2
	(D) identify and distinguish between reflectional and rotational symmetry in a plane figure.	Analyze	Analyze	Sem. 1 – Unit 3 - 3.02 Polygons and Symmetry, Part 2

(4) Logical argument and constructions. The student uses the process skills with deductive reasoning to understand geometric relationships. The student is expected to:				
	(A) distinguish between undefined terms, definitions, postulates, conjectures, and theorems;	Analyze	Analyze	Sem. 1 – Unit 1 - 1.02 Basic Geometric Terms and Definitions 1 Sem. 1 – Unit 1 - 1.03 Basic Geometric Terms and Definitions, Part 2 Sem. 1 – Unit 1 - 1.09 Bisectors and Line Relationships, Part 2
	(B) identify and determine the validity of the converse, inverse, and contrapositive of a conditional statement and recognize the connection between a biconditional statement and a true conditional statement with a true converse;	Evaluate	Evaluate	Sem. 1 – Unit 2 - 2.03 Conditional Statements, Part 1 Sem. 1 – Unit 2 - 2.04 Conditional Statements, Part 2 Sem. 1 – Unit2 - 2.06 Compound Statements and Indirect Proof
	(C) verify that a conjecture is false using a counterexample; and	Analyze	Analyze	Sem. 1 – Unit 2 - 2.06 Compound Statements and Indirect Proof Sem. 1 – Unit 2 – 2.01 Writing Assignment
	(D) compare geometric relationships between Euclidean and spherical geometries, including parallel lines and the sum of the angles in a triangle.	Analyze	Analyze	Sem. 2 – Unit 6 - 6.08 Spherical Geometry
(5) Logical argument and constructions. The student uses constructions to validate conjectures about geometric figures. The student is expected to:				
	(A) investigate patterns to make conjectures about geometric relationships, including angles formed by parallel lines cut by a transversal, criteria required for triangle congruence, special segments of triangles, diagonals of quadrilaterals, interior and exterior angles of polygons, and special segments and angles of circles choosing from a variety of tools;	Apply	Apply	Sem. 1 – Unit 3. - 3.05 Parallel Lines and Transversals, Part 1 Sem. 1 – Unit 3 - 3.13/3.14 Angles in Polygons - 3.15/3.16 Midsegments Sem. 1 – Unit 5 - 5.06 Circumferences and Areas of Circles, Part 2 Sem. 2 – Unit 4 - 4.02 Chords and Arcs, Part 2 Sem. 2 – Unit 4 - 4.06 Inscribed Angles and Arcs, Part 1 Sem. 2 – Unit 4 - 4.07 Inscribed Angles and Arcs, Part 2

	(B) construct congruent segments, congruent angles, a segment bisector, an angle bisector, perpendicular lines, the perpendicular bisector of a line segment, and a line parallel to a given line through a point not on a line using a compass and a straightedge;	Create	Create	Sem. 1 – Unit 1 - 1.04 Measuring Length, Part 1 Sem. 1 – Unit 1 - 1.08 Bisectors and Line Relationships, Part 1 Sem. 1 – Unit 1 - 1.09 Bisectors and Line Relationships, Part 2
	(C) use the constructions of congruent segments, congruent angles, angle bisectors, and perpendicular bisectors to make conjectures about geometric relationships; and	Analyze	Analyze	Sem. 1 – Unit 1 - 1.04 Measuring Length, Part 1 Sem. 1 – Unit 1 – 1.04 Writing Assignment Sem. 1 – Unit 1 - 1.08 Bisectors and Line Relationships, Part 1 Sem. 1 – Unit 1 - 1.09 Bisectors and Line Relationships, Part 2
	(D) verify the Triangle Inequality theorem using constructions and apply the theorem to solve problems.	Evaluate	Evaluate	Sem. 1 – Unit 4 - 4.16 The Triangle Inequality Theorem
(6) Proof and congruence. The student uses the process skills with deductive reasoning to prove and apply theorems by using a variety of methods such as coordinate, transformational, and axiomatic and formats such as two-column, paragraph, and flow chart. The student is expected to:				
	(A) verify theorems about angles formed by the intersection of lines and line segments, including vertical angles, and angles formed by parallel lines cut by a transversal and prove equidistance between the endpoints of a segment and points on its perpendicular bisector and apply these relationships to solve problems;	Evaluate	Evaluate	Sem. 1 – Unit 1 - 1.08 Bisectors and Line Relationships, Part 1 Sem. 1 – Unit 1 - 1.09 Bisectors and Line Relationships, Part 2 Sem. 1 – Unit 3 - 3.05 Parallel Lines and Transversals, Part 1 Sem. 1 – Unit 3 - 3.06 Parallel Lines and Transversals, Part 2 Sem. 1 – Unit 3 - 3.08 Converses of Parallel Line Properties, Part 1 Sem. 1 – Unit 3 - 3.09 Converses of Parallel Line Properties, Part 2

	(B) prove two triangles are congruent by applying the Side-Angle-Side, Angle-Side-Angle, Side-Side-Side, Angle-Angle-Side, and Hypotenuse-Leg congruence conditions;	Evaluate	Evaluate	Sem. 1 – Unit 4 - 4.03 Triangle Congruence: SSS, SAS, and ASA, Part 1 Sem. 1 – Unit 4 - 4.04 Triangle Congruence: SSS, SAS, and ASA, Part 2 Sem. 1 – Unit 4 - 4.07 Triangle Congruence: AAS and HL
	(C) apply the definition of congruence, in terms of rigid transformations, to identify congruent figures and their corresponding sides and angles;	Apply	Apply	Sem. 1 – Unit 4 - 4.01 Congruent Polygons and Their Corresponding Parts, Part 1 Sem. 1 – Unit 4 - 4.02 Congruent Polygons and Their Corresponding Parts, Part 2
	(D) verify theorems about the relationships in triangles, including proof of the Pythagorean Theorem, the sum of interior angles, base angles of isosceles triangles, midsegments, and medians, and apply these relationships to solve problems; and	Evaluate	Evaluate	Sem. 1 – Unit 5 - 5.08 The Pythagorean Theorem, Part 2 Sem. 1 – Unit 5 - 5.13 Proofs and Coordinate Geometry, Part 1 Sem. 1 – Unit 5 - 5.14 Proofs and Coordinate Geometry, Part 2
	(E) prove a quadrilateral is a parallelogram, rectangle, square, or rhombus using opposite sides, opposite angles, or diagonals and apply these relationships to solve problems.	Evaluate	Evaluate	Sem. 1 – Unit 4 - 4.09 Using Triangles to Understand Quadrilaterals, Part 1 Sem. 1 – Unit 4 - 4.10 Using Triangles to Understand Quadrilaterals, Part 2
(7) Similarity, proof, and trigonometry. The student uses the process skills in applying similarity to solve problems. The student is expected to:				
	(A) apply the definition of similarity in terms of a dilation to identify similar figures and their proportional sides and the congruent corresponding angles; and	Apply	Apply	Sem. 2 – Unit 3 - 3.01 Dilations and Scale Factors, Part 1 Sem. 2 – Unit 3 - 3.02 Dilations and Scale Factors, Part 2
	(B) apply the Angle-Angle criterion to verify similar triangles and apply the proportionality of the corresponding sides to solve problems.	Apply	Apply	Sem. 1 – Unit 3 - 3.06 Parallel Lines and Transversals, Part 2 Sem. 1 – Unit 3 - 3.09 Converses of Parallel Line Properties, Part 2
(8) Similarity, proof, and trigonometry. The student uses the process skills with deductive reasoning to prove and apply theorems by using a variety of methods such as coordinate, transformational, and axiomatic and formats such as two-column, paragraph, and flow chart. The student is expected to:				

	(A) prove theorems about similar triangles, including the Triangle Proportionality theorem, and apply these theorems to solve problems; and	Evaluate	Evaluate	Sem. 1 – Unit 3 - 3.06 Parallel Lines and Transversals, Part 2 Sem. 2 – Unit 3 - 3.07 Triangle Similarity, Part 2 Sem. 1 – Unit 3 - 3.09 Converses of Parallel Line Properties, Part 2
	(B) identify and apply the relationships that exist when an altitude is drawn to the hypotenuse of a right triangle, including the geometric mean, to solve problems.	Apply	Apply	Sem. 2 – Unit 3 - 3.11 Indirect Measurement and Additional Similarity Theorems, Part 1 Sem. 2 – Unit 3 – 3.11 Writing Assignment: Geometric Mean
(9) Similarity, proof, and trigonometry. The student uses the process skills to understand and apply relationships in right triangles. The student is expected to:				
	(A) determine the lengths of sides and measures of angles in a right triangle by applying the trigonometric ratios sine, cosine, and tangent to solve problems; and	Apply	Apply	Sem. 2 – Unit 5 - 5.01/5.02 Tangents Sem. 2 – Unit 5 - 5.03/5.04 Sines and Cosines
	(B) apply the relationships in special right triangles 30°-60°-90° and 45°-45°-90° and the Pythagorean theorem, including Pythagorean triples, to solve problems.	Apply	Apply	Sem. 1 – Unit 5 - 5.07 The Pythagorean Theorem, Part 1 Sem. 1 – Unit 5 - 5.08 The Pythagorean Theorem, Part 2 Sem. 1 – Unit 5 - 5.10 Areas of Special Triangles and Regular Polygons, Part 1
(10) Two-dimensional and three- dimensional figures. The student uses the process skills to recognize characteristics and dimensional changes of two- and three- dimensional figures. The student is expected to:				

	(A) identify the shapes of two- dimensional cross-sections of prisms, pyramids, cylinders, cones, and spheres and identify three- dimensional objects generated by rotations of two-dimensional shapes; and	Understand	Understand	Sem. 2 – Unit 1 - 1.03 Solid Shapes and Three-Dimensional Drawing, Part 2 Sem. 2 – Unit 1 – 1.03 Writing Assignment Sem. 2 – Unit 2 - 2.04 Surface Area and Volume of Prisms, Part 2 Sem. 2 – Unit 2 - 2.08 Surface Area and Volume of Cylinders, Part 2 Sem. 2 – Unit 2 - 2.11 Surface Area and Volume of Cones, Part 2 Sem. 2 – Unit 2 - 2.12 Surface Area and Volume of Spheres, Part 1
	(B) determine and describe how changes in the linear dimensions of a shape affect its perimeter, area, surface area, or volume, including proportional and non-proportional dimensional change.	Apply	Apply	Sem. 2 – Unit 3 - 3.01 Dilations and Scale Factors, Part 1 Sem. 2 – Unit 3 - 3.02 Dilations and Scale Factors, Part 2 Sem. 2 – Unit 3 - 3.13 Area and Volume Ratios, Part 1 Sem. 2 – Unit 3 - 3.14 Area and Volume Ratios, Part 2
(11) Two-dimensional and three- dimensional figures. The student uses the process skills in the application of formulas to determine measures of two- and three-dimensional figures. The student is expected to:				
	(A) apply the formula for the area of regular polygons to solve problems using appropriate units of measure;	Apply	Apply	Sem. 1 – Unit 5 - 5.01 Perimeter and Area, Part 1 Sem. 1 – Unit 5 - 5.02 Perimeter and Area, Part 2

	(B) determine the area of composite two-dimensional figures comprised of a combination of triangles, parallelograms, trapezoids, kites, regular polygons, or sectors of circles to solve problems using appropriate units of measure;	Apply	Apply	Sem. 1 – Unit 5 - 5.02 Perimeter and Area, Part 2 Sem. 1 – Unit 5 - 5.04 Areas of Triangles and Quadrilaterals, Part 2 Sem. 1 – Unit 5 - 5.06 Circumferences and Areas of Circles, Part 2 Sem. 1 – Unit 5 - 5.10 Areas of Special Triangles and Regular Polygons, Part 1
	(C) apply the formulas for the total and lateral surface area of three- dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure; and	Apply	Apply	Sem. 2 – Unit 2 - 2.01 Surface Area and Volume, Part 1 Sem. 2 – Unit 2 - 2.03 Surface Area and Volume of Prisms, Part 1 Sem. 2 – Unit 2 - 2.05 Surface Area and Volume of Pyramids, Part 1 Sem. 2 – Unit 2 - 2.07 Surface Area and Volume of Cylinders, Part 1 Sem. 2 – Unit 2 - 2.10 Surface Area and Volume of Cones, Part 1 Sem. 2 – Unit 2 - 2.13 Surface Area and Volume of Spheres, Part 2

	(D) apply the formulas for the volume of three-dimensional figures, including prisms, pyramids, cones, cylinders, spheres, and composite figures, to solve problems using appropriate units of measure.	Apply	Apply	Sem. 2 – Unit 2 - 2.01 Surface Area and Volume, Part 1 Sem. 2 – Unit 2 - 2.04 Surface Area and Volume of Prisms, Part 2 Sem. 2 – Unit 2 - 2.07 Surface Area and Volume of Pyramids, Part 2 Sem. 2 – Unit 2 - 2.08 Surface Area and Volume of Cylinders, Part 2 Sem. 2 – Unit 2 - 2.11 Surface Area and Volume of Cones, Part 2 Sem. 2 – Unit 2 - 2.12 Surface Area and Volume of Spheres, Part 1
(12) Circles. The student uses the process skills to understand geometric relationships and apply theorems and equations about circles. The student is expected to:				
	(A) apply theorems about circles, including relationships among angles, radii, chords, tangents, and secants, to solve non-contextual problems;	Apply	Apply	Sem. 2 – Unit 4 - 4.02 Chords and Arcs, Part 2 Sem. 2 – Unit 4 - 4.04/4.05 Tangents to Circles Sem. 2 – Unit 4 - 4.07 Inscribed Angles and Arcs, Part 2 Sem. 2 – Unit 4 - 4.10 Angles Formed by Secants and Tangents, Part 2 Sem. 2 – Unit 4 - 4.11 Segments of Tangents, Secants, and Chords, Part 1

	(B) apply the proportional relationship between the measure of an arc length of a circle and the circumference of the circle to solve problems;	Apply	Apply	Sem. 2 – Unit 4 - 4.02 Chords and Arcs, Part 2
	(C) apply the proportional relationship between the measure of the area of a sector of a circle and the area of the circle to solve problems;	Apply	Apply	Sem. 1 – Unit 5 - 5.06 Circumferences and Areas of Circles, Part 2
	(D) describe radian measure of an angle as the ratio of the length of an arc intercepted by a central angle and the radius of the circle; and	Understand	Understand	Sem. 2 – Unit 4 - 4.03 Basic Angles and Radian Measure
	(E) show that the equation of a circle with center at the origin and radius r is $x2 + y2 = r2$ and determine the equation for the graph of a circle with radius r and center (h, k), $(x - h)2 + (y - k)2 = r2$.	Apply	Apply	Sem. 2 – Unit 4 - 4.13 Circles in the Coordinate Plane, Part 1 Sem. 2 – Unit 4 - 4.14 Circles in the Coordinate Plane, Part 2
(13) Probability. The student uses the process skills to understand probability in real-world situations and how to apply independence and dependence of events. The student is expected to:				
	(A) develop strategies to use permutations and combinations to solve contextual problems;	Create	Create	Sem. 1 – Unit 6 - 6.02 Permutations and Combinations
	(B) determine probabilities based on area to solve contextual problems;	Apply	Apply	Sem. 1 – Unit 6 - 6.02 Writing Assignment: Geometric Probability
	(C) identify whether two events are independent and compute the probability of the two events occurring together with or without replacement;	Apply	Apply	Sem. 1 – Unit 6 - 6.01 Introduction to Probability
	(D) apply conditional probability in contextual problems; and	Apply	Apply	Sem. 1 – Unit 6 - 6.01 Introduction to Probability
	(E) apply independence in contextual problems.	Apply	Apply	Sem. 1 – Unit 6 - 6.01 Introduction to Probability