Amherst County High School
Geometry Pacing Guide

First Nine Weeks	Standards	Third Nine Weeks	Standards
Basic Geometry Terms (approx. 10 days)		Right Triangles (approx. 12 days)	G.8
Logic and Proofs (approx. 13 days)	G.1	Quadrilaterals (approx. 13 days)	G.9
Parallel Lines (approx. 13 days)	G.2	Polygons (approx. 8 days)	G.10
Distance, Midpoint, and Slope (approx. 5 days)	G.3	Transformations (approx. 7 days)	G.3
9 Week Assessment: 1 day		9 Week Assessment: 1 day	
Assessment Days: 3 days		Assessment Days: 4 days	
Second Nine Weeks	**Standards**	**Fourth Nine Weeks**	**Standards**
Triangle Basics (approx. 5 days)		Circles (approx. 13 days)	G.11
Triangle Congruency (approx. 10 days)	G.6	Equations of Circles (approx. 4 days)	G.12
Triangle Inequality (approx. 10 days)	G.5	Area, Surface Area, Volume (approx. 11 days)	G.13/G.14
Proportions/Similar Triangles (approx. 15 days	G.7	Constructions (approx. 5 days)	G.4
9 Weeks Assessment: 1 day		SOL Review Days: 8 days	
Assessment Days: 4 days		9 Week Assessment: 1 day	
		Assessment Days: 3 days	

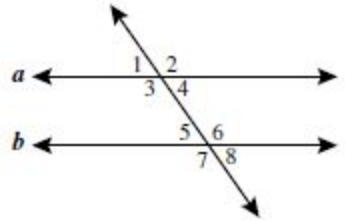
Amherst County Public Schools

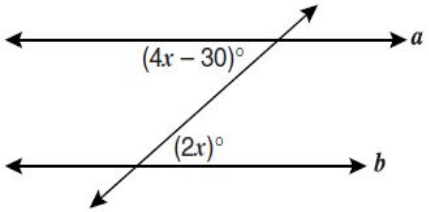
Geometry: Curriculum Guide

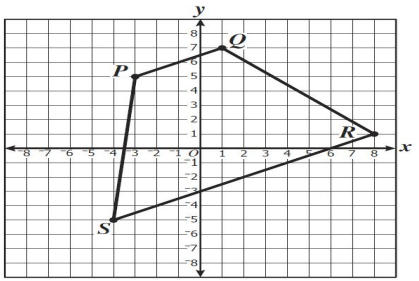
First Nine Weeks SOL Objectives	Vocabulary	Essential Questions/Examples
Basic Geometry Terms **The student will be able to identify and illustrate each of the following terms:** (See vocabulary list) Textbook: Chapter 1 (1.1 – 1.5)	Adjacent Angles Complementary Angles Supplementary Angles Linear Pair Vertical Angles Acute Angle Obtuse Angle Right Angle Collinear Congruent Coplanar Perpendicular Bisector Vertex	● Does the diagram correctly illustrate all the given conditions?
SOL G.1 **The student will use deductive reasoning to construct and judge the validity of a logical argument consisting of a set of premises and a conclusion. This will include** **a) identifying the converse, inverse, and contrapositive of a conditional statement;** **b) translating a short verbal argument into symbolic form and** **c) Determining the validity of a logical argument** **The student will use problem solving, mathematical communication,**	Inductive Reasoning Deductive Reasoning Proof Logic Postulate Theorem Validity Hypothesis Conclusion Conditional Converse Inverse Contrapositive Counterexample Venn diagram	● What is a biconditional statement? ● Can a statement be valid without being true? ● What is the difference between intersection and union? ● How do you interpret a Venn Diagram? **Example:** Find the converse of, "If it is sunny, then I eat out." A) If it is not sunny, then I do not eat out. B) If I do not eat out, then it is not sunny

mathematical reasoning, connections, and representations to: • Identify the converse, inverse, and contrapositive of a conditional statement. • Translate verbal arguments into symbolic form, such as $(p \rightarrow q)$ and $(\sim p \rightarrow \sim q)$. • Determine the validity of a logical argument. • Determine that an argument is false using a counter example. • "Deductive or inductive reasoning is used in mathematical proofs. In this course deductive reasoning and logic are used in direct proofs. • Direct Proofs are presented in different formats (typically two columns or paragraphs) and employ definitions, postulates, theorems, and Algebraic Justifications including coordinate methods. • Use valid forms of deductive reasoning, including the law of syllogism, the law of the contrapositive, the law of detachment, and counterexamples. • Select and use various types of reasoning and methods of proof, as appropriate. • Use Venn diagrams to represent set relationships, such as intersection		C) If I eat out, then it is sunny. D) If it is sunny, then I do not eat out. **Example:** Let p represent $x^2 = 21$. Let q represent x is not a whole number. Which is a representation of the statement below? If x is a whole number, then $x^2 \neq 21$. A) $\sim p \rightarrow \sim q$ B) $\sim p \rightarrow q$ C) $p \rightarrow \sim q$ D) $\sim q \rightarrow \sim p$

and union. • Interpret Venn diagrams. • Recognize and use the symbols of formal logic, which include →, ↔, ~, ∴ , ∧ and ∨ . Textbook: Chapter 2 (2.1 – 2.8) Extension: Additional practice on symbols of formal logic.		
SOL G.2 **The student will use the relationships between angles formed by two lines intersected by a transversal to:** a) Prove two or more lines are parallel; and b) solve problems including practical problems, involving angles formed when parallel lines are intersected by a transversal. **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** c) Solve real-world problems involving angles formed when parallel lines are cut by a transversal. d) Verify the parallelism, using	Parallel Perpendicular Transversal Corresponding Consecutive/Same-Side Interior Exterior Alternate	h) What are the angle relationships that exist for parallel lines cut by a transversal? i) How do you determine whether two lines are parallel? j) What is a transversal? k) How does the angle relationship determine the equation? **Example:**

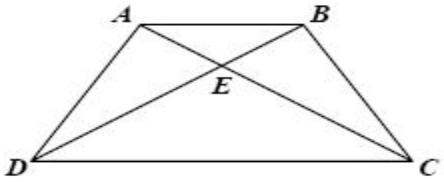
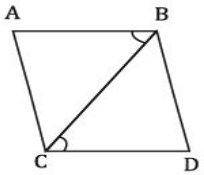
algebraic and coordinate methods as well as deductive proofs; and e) f) Solve problems by using the relationships between pairs of angles formed by the intersection of two parallel lines and a transversal including corresponding angles, alternate interior angles, alternate exterior angles, same side exterior angles and same-side (consecutive) interior angles. g) Solve real-world problems involving intersecting and parallel lines in a plane. Textbook: Chapter 3 (3.1 – 3.5)		 **Line a is parallel to line b if —** **A** $m\angle 4 = m\angle 2$ **B** $m\angle 3 = m\angle 5$ **C** $m\angle 4 = m\angle 5$ **D** $m\angle 3 = m\angle 2$ **Example:**

		 **Which value for x will make a parallel to b?** F 5 G 15 H 20 J 35
SOL G.3 **The student will solve problems involving symmetry and transformation. This includes:** **a) investigating and using formulas for finding distance, midpoint, and slope;** **b) applying slope to verify and determine whether lines are parallel or perpendicular.** **c) investigating symmetry and determining whether a figure is symmetric with respect to a line or a point and** **d) determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.**	Distance Formula Midpoint Formula Pythagorean Theorem Coordinate Plane Quadrants Parallel Lines Perpendicular Lines Slope	q) How do you determine whether two lines are parallel or perpendicular by their slopes? r) How is the Pythagorean Theorem related to the Distance Formula? s) How do you find the missing endpoint given one endpoint and the midpoint? t) What are they key vocabulary terms to determine which formula to use?

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to: l) Find the coordinates of the midpoint of a segment, using the midpoint formula. m) Use the midpoint formula to determine the endpoint of a segment in addition to the midpoint n) Use a formula to find the slope of a line. o) Compare the slopes to determine whether two lines are parallel, perpendicular, or neither. p) Apply the distance formula to find the length of a line segment when given the coordinates of the endpoints. Textbook: Chapter 1 (1.3) Chapter 3 (3.3 & 3.4)		**Example:**  What is the midpoint of QR? What is the distance of SQ? **Example:** Line SQ contains the following points. S(9, -8) and Q(1, 5). Find the slope of SQ and find the slope of a line perpendicular to SQ.

Second Nine Weeks SOL Objectives	**Vocabulary**	**Essential Questions**
Triangle Basics **The student will be able to:**	Acute Triangle Right Triangle	u) What is the sum of the angles in

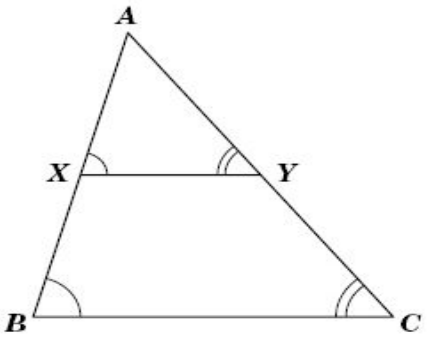
a) Identify the types of triangles by their angles. **b) Identify the types of triangles by their sides.** **c) Use the Triangle Sum Theorem** **d) Use the Isosceles Triangle Theorem** **e) Use the Exterior Angle Theorem** Textbook: Chapter 4 (4.1, 4.2, & 4.6)	Obtuse Triangle Equiangular Triangle Equilateral Triangle Isosceles Triangle Scalene Triangle Exterior Angle Base Angle Vertex Angle Remote Interior Angles	a triangle? v) How does the exterior angle relate to the remote interior angles? w) How does the type of triangle translate to the equation?
SOL G.6 **The student, given information in the form of a figure or statement, will prove two triangles are congruent.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** x) Use definitions, postulates, and theorems to prove triangles congruent. y) Use coordinate methods, such as the distance formula and the slope formula, to prove two triangles are congruent. z) Use algebraic methods to prove two triangles are congruent. Textbook: Chapter 4 (4.3 – 4.5) Extension: Additional practice with proofs	Congruent SSS SAS ASA AAS HL CPCTC Reflexive Property Vertical Angle Theorem Include/Non-Included Side	aa) What are the five parts of a formal proof? bb) What two characteristics can you mark in triangles that are not given? cc) What is the difference between an included and non-included side? dd) When do you use CPCTC? **<u>Example:</u>**

		 **Given:** $\overline{AC} \cong \overline{BD}$ $\overline{AD} \cong \overline{BC}$ **Which could be used to prove** $\Delta DCA \cong \Delta CDB$**?** **Example:** _____ 2. What additional information is needed to prove the triangles are congruent by SAS?  A) AC ≅ CD B) $\angle A \cong \angle D$ C) AB ≅ CD D) $\angle ABC \cong \angle DBC$
Special Segments in Triangles **The student will be able to identify, illustrate, and solve equations for the following segments in a triangle:** **A) Median**	Median Altitude Angle Bisector Perpendicular Bisector	ee) What are the characteristics of each special segment? ff) How do you set up and solve equations for each special segment?

B) Altitude **C) Angle Bisector** **D) Perpendicular Bisector** Textbook: Chapter 5 (5.1)		
SOL G.5 **The student, given information concerning the lengths of sides and/or measures of angles in triangles, will:** **a) order the sides by length, given the angle measures;** **b) order the angles by degree measure, given the side lengths;** **c) determine whether a triangle exists; and** **d) determine the range in which the length of the third side must lie.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** gg) Order the sides of a triangle by their lengths when given the measures of the angles. hh) Order the angles of a triangle by their measures when given the lengths of the sides. ii) Given the lengths of three segments, determine whether a	Range Opposite Inequality Exterior Angle Inequality Theorem Hinge Theorem	ll) How do you find the range of the third side given two sides of a triangle? mm) How do you determine whether three side lengths form a triangle? nn) How do the sides relate to the angle of a triangle and vice versa? oo) How do you compare segments and sides in separate triangles? **Example:** On a map Richmond, Charlottesville, and Lynchburg form a triangle. The distance from Richmond to Charlottesville is 50 miles and Lynchburg to Charlottesville is 70 miles. What is the possible distance from Richmond to Lynchburg? A. 20 miles B. 100 miles C. 150 miles D. 170 miles **Example:**

triangle could be formed. jj) Given the lengths of two sides of a triangle, determine the range in which the length of the third side must lie. kk) Solve real-world problems given information about the lengths of sides and/or measures of angles in triangles. Textbook: Chapter 5 (5.2, 5.4, & 5.5)		Which of the following are not lengths of a triangle? 4, 7, 11 4, 3, 6 9, 2, 5 8, 17, 9 48, 52, 80 **Example:** Triangle PRQ consists of the following angles: Angle P = 55, Angle R = 65, and Angle Q = 60. List the sides from least to greatest.
SOL G.7 **The student, given information in the form of a figure or statement, will use direct prove two triangles are similar, using algebraic and coordinate methods as well as deductive proofs.** pp) Similarity has real-world applications in a variety of areas, including art, architecture, and the sciences. qq) Similarity does not depend on the position of the triangle. rr) Congruent figures are also similar, but similar figures are not necessarily congruent. Textbook: Chapter 6 (6.1 – 6.5)	Similarity Congruence Proportion Ratio Scale Factor Corresponding Sides AA SAS SSS	ss) What is the relationship between sides and angles of similar triangle? tt) Does the orientation of the triangles matter? uu) Are similar figures always congruent? vv) What is the difference between similar and congruent triangles?

Example:



Which is a true proportion?

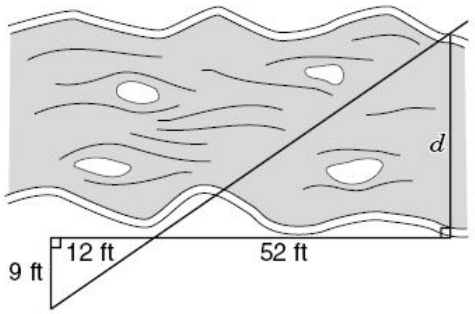
a. $\frac{AX}{AB} = \frac{AY}{AC} = \frac{XY}{BC}$

b. $\frac{AX}{XB} = \frac{AY}{YC} = \frac{XY}{BC}$

c. $\frac{XB}{AX} = \frac{YC}{AY} = \frac{BC}{XY}$

d. $\frac{AX}{AB} = \frac{AC}{AY} = \frac{XY}{BC}$

Example:



The distance across a river was estimated by making the measurements shown. Which is a good estimate of distance d?

Third Nine Weeks SOL Objectives	Vocabulary	Essential Questions
SOL G.8 **The student will solve problems, including practical problems involving right triangles. This will include applying** **a)The Pythagorean theorem and its converse;** **b) Properties of special right triangles; and** **c) trigonometric ratios** ww) Determine whether a triangle formed with three given lengths is a right triangle. xx) Solving problems for missing lengths in right triangles may include situations where rationalizing denominators may be necessary. yy) Solve for missing lengths in geometric figures, using properties of 45°-45°-90° triangles. zz) Solve for missing lengths in geometric figures, using properties of 30°-60°-90° triangles.	Hypotenuse Pythagorean theorem Special right triangle Trigonometry Geometric Mean Law of Sines* Law of Cosines* *Pre-AP (time permitting)	• Do three given sides form a right triangle? • How do you find the missing side of a special right triangle? • When is it appropriate to use trigonometry/special right triangles or the Pythagorean Theorem? • What is the relationship between the sine and cosine of complementary angles? • What is the difference between angle of elevation and angle of depression? **Example:** Guy wires 80 feet long support a 65-foot tall telephone pole. To the nearest tenth of a degree, what angle will the wires make with the ground? **Example:** Which set of measures could represent the

aaa) Solving problems involving right triangles may include determining missing side lengths or angle measurements. bbb) Solve problems involving right triangles, using sine, cosine, and tangent ratios. ccc) Solve real-world problems, using right triangle trigonometry and properties of right triangles. ddd) Explain and use the relationship between the sine and cosine of complementary angles.† Textbook: Chapter 7 (7.1 – 7.5)		sides of a right triangle? **A.** 2, 3, 4 **B.** 7, 11, 14 **C.** 8, 10, 12 **D.** 9, 12, 15
SOL G.9 **The student will verify and use properties of quadrilaterals to solve problems including practical problems.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** eee) Solve problems, including real-world problems, using the properties specific to parallelograms, rectangles, rhombi, squares, isosceles trapezoids, and trapezoids. fff)Prove that quadrilaterals have	Properties Hierarchy Quadrilateral Parallelogram Rectangle Rhombi Squares Isosceles trapezoid Trapezoid Median of a Trapezoid Diagonal Inscribed	• How does the hierarchy help determine the relationship between sides, angles, and diagonals of a quadrilateral? • What kinds of triangles are formed from the diagonals of each quadrilateral? • What are the five properties that are true for all parallelograms? • How do you determine which shape is represented by a given property? • How does each of the formulas

specific properties, using coordinate and algebraic methods, such as the distance formula, slope, and midpoint formula. ggg) Prove the characteristics of quadrilaterals, using deductive reasoning, algebraic, and coordinate methods. hhh) Prove properties of angles for a quadrilateral inscribed in a circle. Textbook: Chapter 8 (8.2 – 8.7)		(distance, midpoint, and slope) help you determine which quadrilateral is represented? **Example:** Which of the following is true for all rectangles? **A.** The diagonals are perpendicular. **B.** The consecutive angles are supplementary. **C.** The opposite sides are supplementary. **D.** The opposite angles are complementary. **Example:** The length of the median of trapezoid *EFGH* is 17 centimeters. If the bases have lengths $2x + 4$ and $8x - 50$, find x.
SOL G.10 **The student will solve problems including practical problems involving angles of convex polygons. This will include determining the** **a) sum of the interior and exterior angles;** **b) measure of an interior and/or exterior; and** **c) number of sides of a regular polygon**	Polygon Tessellation Tessellate Regular polygon Non-regular polygon Intersecting Exterior angle Linear pair Convex Non-convex/Concave	• How do you determine if a polygon will tessellate? • What is the relationship between each interior and exterior angle of a polygon? • How do the diagonals of a polygon help determine the formula for the sum of the interior angles of a polygon?

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to: iii) Solve real-world problems involving the measures of interior and exterior angles of convex polygons. jjj) Determine angle measures of a regular convex polygon in a tessellation. kkk) Identify tessellations in art, construction, and nature. lll) Find the sum of the measures of the interior and exterior angles of a convex polygon. mmm) Find the measure of each interior and exterior angle of a regular polygon. nnn) Find the number of sides of a regular polygon, given the measures of interior or exterior angles of the polygon. Textbook: Chapter 10 (10.1)		• Do the formulas for polygons work for both convex and non-convex/concave figures? • How do you determine the sum of the interior angles of a convex polygon? **Example:** Find the sum of the interior angles of a convex 24-gon. **Example:** If the measure of each interior angle of a regular polygon is 168, find the number of sides in the polygon.
SOL G.3 **The student will use pictorial representations, including computer software, constructions, and coordinate methods, to solve problems involving symmetry and**	Transformation Reflection Rotation Dilation Translation Point Symmetry	• How do you determine what types of symmetry a figure has? • What is the difference in image and pre-image?

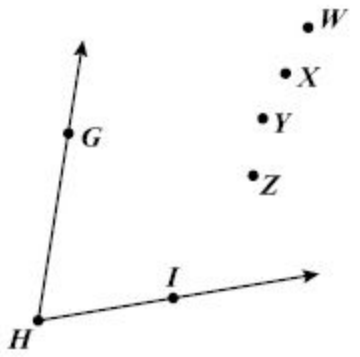
transformation. This will include: **c) investigating symmetry and determining whether a figure is symmetric with respect to a line or a point; and** **d) determining whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** ooo) Determine whether a figure has point symmetry, line symmetry, both, or neither. ppp) Given an image and preimage, identify the transformation that has taken place as a reflection, rotation, dilation, or translation. qqq) Transformations may be a combination of transformations, includes a list of possible transformations; reflections limited to reflections over any horizontal line, vertical line, the line y = x or the line y = -x; rotations limited to 90°, 180°, 270°, or 360° on a coordinate grid where the center of rotation is the origin; dilations	Line Symmetry Image Pre-image Rotational Symmetry * (Pre AP)	• How do you determine which transformation has occurred when given pre-image and image? • How does rotational symmetry relate to point symmetry? • How does scale factor help you determine the new coordinates in a dilation or vice versa? **Example:** Given *A* (3, -7), under which reflection is *A'* (3, 7)? **A.** reflection in the *x*-axis **B.** reflection in the *y*-axis **C.** reflection in the origin **D.** reflection in *y* = *x* **Example:** Which figure could tessellate the plane? **A.** regular pentagon **B.** regular hexagon **C.** regular octagon **D.** regular heptagon

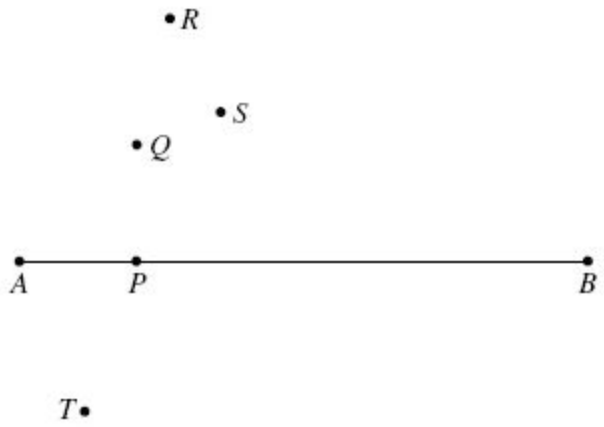
limited to those from a fixed point on the coordinate grid. Textbook: Chapter 9 (9.1 – 9.5)		

Fourth Nine Weeks SOL Objectives	Vocabulary	Essential Questions
G.11 **The student will solve problems, including practical problems, by applying properties of circles. This will include determining:** **a) angle measures formed by intersecting chords, secants, and/or exterior angles;** **b) measure of an interior and/or exterior angle; and** **c) arc length; and** **d) areas of a sector.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** rrr) Find lengths, angle measures, and arc measures associated with - two intersecting chords; - two intersecting secants; - an intersecting secant and tangent; - two intersecting tangents; and - central and inscribed angles.	Angle Arc Tangent Secant Chord Central Angle Inscribed Angle Area of a Sector Length of an Arc Exact (Circumference and Area)	• How are central and inscribed angles related? • What is the relationship between an angle and its intercepted arc(s)? • What are the rules for finding the lengths of secants, tangents, and chords? • How do you find the length of an arc and the area of a sector? • Given a quadrilateral inscribed in a circle what angle relationships exist? **Example:** The diameter of circle *C* is 18 units long. Find the length of an arc that has a measure of 100 to the nearest hundredth. **Example:** Find the radius and diameter of a circle whose

sss) Calculate the area of a sector and the length of an arc of a circle, using proportions. ttt) Solve real-world problems associated with circles, using properties of angles, lines, and arcs. uuu) Verify properties of circles, using deductive reasoning, algebraic, and coordinate methods. Textbook: Chapter 10 (10.1 – 10.7)		circumference is 60π meters?
SOL G.12 **The student will solve problems involving equations of circles.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** vvv) Identify the center, radius, and diameter of a circle from a given standard equation. www) Use the distance formula to find the radius of a circle. xxx) Given the coordinates of the center and radius of the circle, identify a point on the circle. yyy) Given the equation of a	Circle Locus Conics Center Radius Diameter	• How do you identify whether a point is on the circle? • How do you find the equation of a circle given the endpoints of the diameter? • How do you find the equation of a circle given the center and a point on the circle? • How do you determine whether to use the distance or midpoint formulas when given information about a given circle? **Example:** Write the equation of the circle whose center is at (-7, 8) and radius is 9.

circle in standard form, identify the coordinates of the center and find the radius of the circle. zzz) Given the coordinates of the endpoints of a diameter, find the equation of the circle. aaaa) Given the coordinates of the center and a point on the circle, find the equation of the circle. bbbb) Recognize that the equation of a circle of given center and radius is derived using the Pythagorean Theorem. cccc) Solve problems involving equations of circles. Textbook: Chapter 10 (10.8)		**Example:** Find the radius of a circle whose equation is $(x+3)^2+(y-2)^2=r^2$ and contains (0, 8).
SOL G.4 **The student will construct and justify the constructions of:** **a) a line segment congruent to a given line segment;** **b) the perpendicular bisector of a line segment;** **c) a perpendicular to a given line from a point not on the line;** **d) a perpendicular to a given line at a given point on the line;** **e) the bisector of a given**	Line segment Bisect Perpendicular bisector Angle bisector Congruent Parallel Inscribe Circumscribe Tangent	• How do you justify which construction is given from the position of the arcs? • How are the constructions for perpendicular bisector of a line segment to a perpendicular to a given line related? • How do the angles formed from a transversal help you construct a line parallel to a given line?

angle; **f) an angle congruent to a given angle;** **g) a line parallel to a given line through a point not on the given line; and** **h) an equilateral triangle, a square, and a regular hexagon inscribed in a circle.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** ● Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.* ● Construct the inscribed and circumscribed circles of a triangle.* ● Construct a tangent line from a point outside a given circle to the circle.* Teacher Made Unit		**Example:** **Use your compass and straightedge to construct the bisector of $\angle GHI$.**  **Which point lies on this bisector?** a. W b. X c. Y d. Z **Example:**

		Use a compass, a straightedge, and the drawing below to answer the question.  **Which point lies on the line through P perpendicular to $\overline{AB}$?** a. Q b. R c. S d. T
SOL G.13 **The student will use surface area and volume of three-dimensional objects to solve practical problems.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** dddd) Find the total surface area of cylinders, prisms, pyramids, cones, spheres, and hemispheres using the	Three dimension 3D Surface area Volume Cylinders Prisms Pyramids Cones Spheres Lateral Area Composite Figures Units Slant Height Height Base Perimeter	• What is the difference in the concepts of perimeter, area, and volume? • What is the difference in surface area and lateral area? • How do you reverse a formula to find a missing dimension? • What are the key words for area and volume?

appropriate formulas. eeee) Calculate the volume of cylinders, prisms, pyramids, cones, spheres, and hemispheres using the appropriate formulas. ffff) Solve problems involving lateral area of cylinders, prisms, and regular pyramids. gggg) Solve problems, including real-world problems, involving total surface area and volume of cylinders, prisms, pyramids, cones, and spheres as well as combinations of three-dimensional figures. hhhh) Calculators may be used to find decimal approximations for results. Textbook: Chapter 11 (11.1 – 11.3) Textbook: Chapter 12 (12.3 – 12.7) Textbook: Chapter 13 (13.1 – 13.3)	Area Net	• What is the difference between a prism and a pyramid? • How does the Pythagorean Theorem help you find a missing dimension? **Example:** The surface area of a cube is 96 square inches. Find the length of an edge. **A.** $\sqrt{24}$ in. **B.** 4 in. **C.** 8 in. **D.** 16 in. **Example:** Find the volume of a 10cm x 9 cm rectangular pyramid with a slant height of 13cm. **A.** 360 cm^3 **B.** 390 cm^3 **C.** 1080 cm^3 **D.** 1170 cm^3
SOL G.14 **The student will apply the concepts of similarity to two- or three-dimensional geometric figures. This will include:** **a) compare ratios between lengths, perimeters, areas, and volumes of similar figures;** **b) determine how changes in one or more dimensions of**	Two dimensional 2D Three dimensional 3D Similarity Perimeter Surface area Volume Scale factor Proportion	• How are the ratios of perimeter, area, and volume related for similar figures? • How does the change in one dimension affect the perimeter, area, and volume of an object? • Given two figures are they similar?

a figure affect area and/or volume of the figure; **c) determining how changes in area and/or volume of a figure affect one or more dimensions of the figure; and** **d) solve problems, including practical problems about similar geometric figures.** **The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to:** iiii) Compare ratios between side lengths, perimeters, areas, and volumes, given two similar figures. jjjj) Describe how changes in one or more dimensions affect other derived measures (perimeter, area, total surface area, and volume) of an object. kkkk) Describe how changes in one or more measures (perimeter, area, total surface area, and volume) affect other measures of an object. llll) Solve real-world problems		**Example:** The ratio of the heights of two similar cones is 2:3. Find the ratio of their surface areas. **Example:** How does the volume of a cone change when its radius is doubled? **A.** The volume is multiplied by 2. **B.** The volume is multiplied by 4. **C.** The volume is multiplied by 8. **D.** The volume is divided by 2.

involving measured attributes of similar objects. Textbook: Chapter 13 (13.4) Teacher Made Unit		