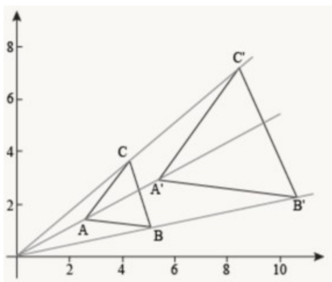
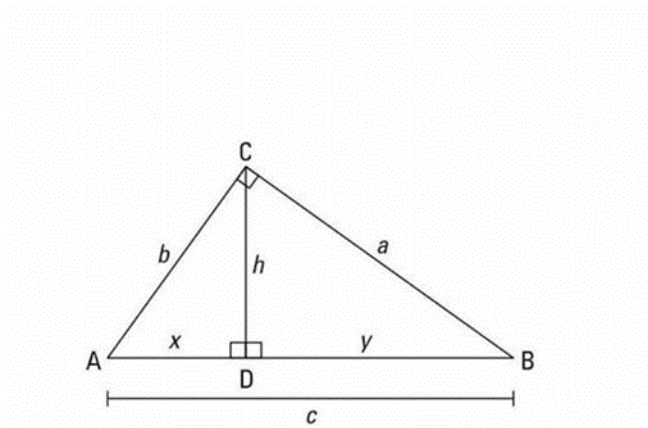
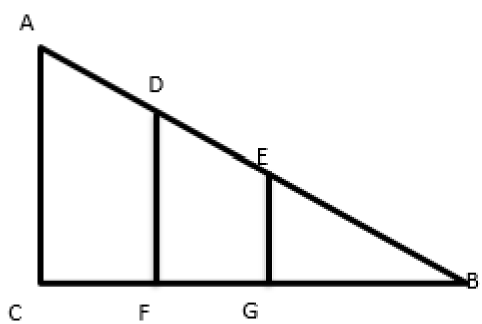
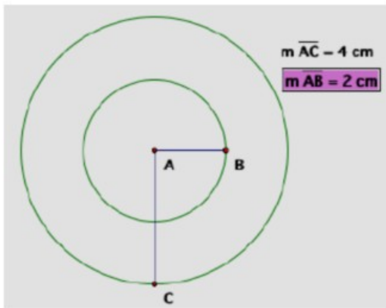
Arkansas Geometry Standards correlated to Amsco Geometry Lessons

Arkansas Standard		Amsco Lesson
HSG.CO.A.1	Based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc, define: • Angle • Line segment • Circle • Perpendicular lines • Parallel lines	1.1,4.1,8.1
HSG.CO.A.2	• Represent transformations in the plane (*e.g. using transparencies, tracing paper, geometry software, etc.).* • Describe transformations as functions that take points in the plane as inputs and give other points as outputs. • Compare transformations that preserve distance and angle to those that do not. (*e.g., translation versus dilation).*	1.4,1.5,1.6,1.7,2.2,2.4
HSG.CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and/or reflections that carry it onto itself.	1.5,1.6
HSG.CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	1.5,1.6,1.7,11.3
HSG.CO.A.5	• Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure, (*e.g., using graph paper, tracing paper, miras, geometry software, etc.).* • Specify a sequence of transformations that will carry a given figure onto another.	1.3,1.4,1.5,1.6,1.7,2.4
HSG.CO.B.6	• Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure • Given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	1.3,1.4,1.5,1.6,1.7
HSG.CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	1.3,5.4
HSG.CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions. Investigate congruence in terms of rigid motion to develop the criteria for triangle congruence (ASA, SAS, AAS, SSS, and HL)	5.4
HSG.CO.C.9	Apply and prove theorems about lines and angles. *Theorems include but are not limited to: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	3.3,3.4,4.1,4.2,4.3,6.2
HSG.CO.C.10	Apply and prove theorems about triangles. *Theorems include but are not limited to: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*	4.5,5.1,5.3,5.4,6.1,6.4
HSG.CO.C.11	Apply and prove theorems about quadrilaterals. *Theorems include but are not limited to relationships among the sides, angles, and diagonals of quadrilaterals and the following theorems concerning parallelograms: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*	9.1,9.2,9.3

HSG.CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Constructions may include but are not limited to: copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*	1.1,4.3,5.1,6.2,6.3,9.6
HSG.CO.D.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle. Note: Constructions are not an isolated topic and therefore should be integrated throughout the course.	8.3
HSG.CO.E.14	Apply inductive reasoning and deductive reasoning for making predictions based on real world situations using: • Conditional Statements (inverse, converse, and contrapositive) • Venn Diagrams	NONE
HSG.SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor. • A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. • The dilation of a line segment is longer or shorter in the ratio given by the scale factor.  http://www.shmoop.com/common-core-standards/ccss-hs-g-srt-1a.html	2.2
HSG.SRT.A.2	Given two figures: • Use the definition of similarity in terms of similarity transformations to determine if they are similar • Explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	2.2,2.3
HSG.SRT.A.3	Use the properties of similarity transformations to establish the AA, SAS~, SSS~ criteria for two triangles to be similar.	7.1

HSG.SRT.B.4	Use triangle similarity to apply and prove theorems about triangles. *Theorems include but are not limited to: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*  $\frac{x}{b} = \frac{b}{c}, \quad \frac{y = c - x}{a} = \frac{a}{c}$ $x = \frac{b^2}{c}, \quad c - x = \frac{a^2}{c}$ $x + (c - x) = c$ $\frac{a^2}{c} + \frac{b^2}{c} = c$ $a^2 + b^2 = c^2$	7.4
HSG.SRT.B.5	• Use congruence (SSS, SAS, ASA, AAS, and HL) and similarity (AA, SSS~, SAS~) criteria for triangles to solve problems • Use congruence and similarity criteria to prove relationships in geometric figures.	2.1,2.2,2.3,5.2,5.3,5.4, 6.2,7.1,7.2,7.4
HSG.SRT.C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. *For example: Trigonometric ratios are related to the acute angles of a triangle, not the right angle. The values of the trigonometric ratio depend only on the angle. Consider the following three similar triangles (why are they similar)?*  	7.6
HSG.SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles.	7.6

HSG.SRT.C.8	Use trigonometric ratios, special right triangles, and/or the Pythagorean Theorem to find unknown measurements of right triangles in applied problems.	7.3,7.5,7.6,9.8
HSG.SRT.D.9	(+) Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	Additional 7.8
HSG.SRT.D.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.	Additional 7.8
HSG.SRT.D.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles	Additional 7.8
HSG.C.A.1	Prove that all circles are similar.  http://www.azed.gov/azcommoncore/files/2012/11/high- school-ccss-flip-book-usd-259-2012.pdf	Additional 11.3
HSG.C.A.2	Identify, describe, and use relationships among angles, radii, segments, lines, arcs, and chords as related to circles.	Additional 8.1,8.2,8.3,8.4
HSG.C.A.3	• Construct the inscribed and circumscribed circles of a triangle. • Prove properties of angles for a quadrilateral inscribed in a circle.	Additional 6.3,6.5,8.1,8.3
HSG.C.B.5	• Derive using similarity that the length of the arc intercepted by an angle is proportional to the radius. • Derive and use the formula for the area of a sector. • Understand the radian measure of the angle as a unit of measure.	Additional 8.5
HSG.GPE.A.1	• Derive the equation of a circle of given center and radius using the Pythagorean Theorem • Complete the square to find the center and radius of a circle given by an equation.	Additional 11.3
HSG.GPE.A.2	(+)Derive the equation of a parabola given a focus and directrix.	11.2
HSG.GPE.A.3	(+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	Additional 11.5,11.6
HSG.GPE.B.4	Use coordinates to prove simple geometric theorems algebraically. *For example: Prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point (1, √3) lies on the circle centered at the origin and containing the point (0, 2).*	6.1,6.4,9.5
HSG.GPE.B.5	• Prove the slope criteria for parallel and perpendicular lines. • Use the slope criteria for parallel and perpendicular lines to solve geometric problems.	4.4,9.1

HSG.GPE.B.6	Find the midpoint between two given points; and find the endpoint of a line segment given the midpoint and one endpoint.	1.2,6.3,6.4
HSG.GPE.B.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.	9.6
HSG.GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *For example: Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	Additional 8.1,10.3
HSG.GMD.A.2	(+) Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	Additional 10.4
HSG.GMD.A.3	• Use volume formulas for cylinders, pyramids, cones, spheres, and to solve problems which may involve composite figures • Compute the effect on volume of changing one or more dimension(s).	10.3
HSG.GMD.B.4	Identify the shapes of two-dimensional cross-sections of three- dimensional objects • Identify three-dimensional objects generated by rotations of two-dimensional objects.	Additional 10.1,11.1,11.2
HSG.MG.A.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	9.6,9.7,9.8,10.2,10.3
HSG.MG.A.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	9.6,10.2, 10.5
HSG.MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	9.6,9.8, 10.2,10.3