AVENTA LEARNING

Alignment Document
State of South Dakota and Aventa Learning Geometry

Geometry

Goals	Indicators	Standards	Unit Name	Course Topic Description
9-12.A Algebra	**9-12.A.1** Use procedures to transform algebraic expressions.	**9-12.A.1.1** Students are able to write equivalent forms of algebraic expressions using properties of the set of real numbers.	Reasoning and Intro to Proof Reasoning and Intro to Proof	Using Algebraic Properties in Geometric Proofs A Sample Geometric Proof Using Algebraic Postulates
		9-12.A.1.1.a Evaluate algebraic expressions.		
		9-12.A.1.1.b Use laws of exponents.		
		9-12.A.1.1.c Use conventional order of operations, including grouping and exponents.		
	9-12.A.2 Use a variety of algebraic concepts and methods to solve equations and inequalities.	**9-12.A.2.1** Students are able to use algebraic properties to transform multi-step, single-variable, first-degree equations.		
		9-12.A.2.2 Students are able to use algebraic properties to transform multi-step, single-variable, first-degree inequalities and represent solutions using a number line.	Special Triangles Special Triangles	Pythagorean Theorem How to Apply Pythagorean Theorem
	9-12.A.3 Interpret and develop mathematical models.	**9-12.A.3.1** Students are able to create linear models to represent problem situations.	Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate	How to Write the Equation of a Line Slope Form

			Plane	
			Parallel Lines and the Coordinate Plane	Point-Slope Form
			Parallel Lines and the Coordinate Plane	Slope-Intercept Form
			Parallel Lines and the Coordinate Plane	How to Display a Line on the Coordinate Plane
			Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
			Parallel Lines and the Coordinate Plane	Intersecting Lines
			Parallel Lines and the Coordinate Plane	Parallel Lines
			Parallel Lines and the Coordinate Plane	Perpendicular Lines
		9-12.A.3.1.a Calculate and interpret slope.	Parallel Lines and the Coordinate Plane	Slope Form
			Parallel Lines and the Coordinate Plane	Point-Slope Form

			Parallel Lines and the Coordinate Plane	Slope-Intercept Form
		9-12.A.3.2 Students are able to distinguish between linear and nonlinear models.		
	9-12.A.4 Describe and use properties and behaviors of relations, functions and inverses.	**9-12.A.4.1** Students are able to use graphs, tables, and equations to represent linear functions.	Parallel Lines and the Coordinate Plane	How to Write the Equation of a Line
			Parallel Lines and the Coordinate Plane	Slope Form
			Parallel Lines and the Coordinate Plane	Point-Slope Form
			Parallel Lines and the Coordinate Plane	Slope-Intercept Form
			Parallel Lines and the Coordinate Plane	How to Display a Line on the Coordinate Plane
			Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
9-12.G Geometry	**9-12.G.1** Use deductive and inductive reasoning to recognize and apply properties of geometric figures.	**9-12.G.1.1** Students are able to apply the properties of triangles and quadrilaterals to find unknown parts.	Triangles	The Structure of a Triangle
			Triangles	Theorem 1
			Triangles	Classification of Triangles
			Triangles	Angle Based Classification of Triangles

			Triangles	Congruence of Geometric Figures
			Triangles	Congruent Postulate 1 (SAS Postulate)
			Triangles	Postulate 2 (ASA Postulate)
			Triangles	Postulate 3 (SSS Postulate)
			Triangles	Postulate 4 (AAS Postulate)
			Triangles	Postulate 5 (HL Postulate)
			Quadrilaterals and Polygons	A Square and Its Properties
			Quadrilaterals and Polygons	Rectangles and Their Properties Properties of Diagonals in Squares and Rectangles
			Quadrilaterals and Polygons	Parallelograms
			Quadrilaterals and Polygons	Parallelograms Proof
			Quadrilaterals and Polygons	Special Segments in a Polygon: Diagonals
			Quadrilaterals and Polygons	Apothems
			Quadrilaterals and Polygons	Sum of the Interior Angles of a Convex Polygon

			Quadrilaterals and Polygons	Measure of an Interior Angle in Regular Convex Polygon
		9-12.G.1.2 Students are able to identify and apply relationships among triangles.	Triangles	The Structure of a Triangle
			Triangles	Theorem 1
			Triangles	Classification of Triangles
			Triangles	Angle Based Classification of Triangles
			Triangles	Congruence of Geometric Figures
			Triangles	Congruent Postulate 1 (SAS Postulate)
			Triangles	Postulate 2 (ASA Postulate)
			Triangles	Postulate 3 (SSS Postulate)
			Triangles	Postulate 4 (AAS Postulate)
			Triangles	Postulate 5 (HL Postulate)
			Triangles	Special Segments in Triangles
			Triangles	Altitude
			Triangles	Median
			Triangles	Angle Bisector
			Triangles	Property of Bisectors of Triangles
			Triangles	Perpendicular Bisectors

			Triangles	Properties of Perpendicular Bisectors of Triangles
			Special Triangles	Isosceles Triangle and its Parts
			Special Triangles	Theorem 1
			Special Triangles	Properties of Medians of Isosceles Triangle
			Special Triangles	Properties of Altitudes of Isosceles Triangle
			Special Triangles	Properties of Angle Bisectors of Isosceles Triangle
			Special Triangles	Properties of Perpendicular Bisectors of Isosceles Triangle
			Special Triangles	Equilateral or Equiangular Triangle
			Special Triangles	When Two Equilateral Triangles Are Congruent
			Special Triangles	Right Triangles: Basic Theorem
			Special Triangles	30-60-90 Triangle
			Special Triangles	45-45-90 Triangle (Isosceles Right Triangle)
			Special Triangles	Pythagorean Theorem
			Special Triangles	How to Apply Pythagorean Theorem

			Special Triangles	Side-Angle Inequality in a Triangle
			Special Triangles	Exterior Angle Inequality
			Special Triangles	Indirect Proof
			Special Triangles	A Practical Example
			Special Triangles	Shortest Distance Between a Point and a Line
			Special Triangles	Triangle Inequality
			Special Triangles	Difference of Sides Inequality
			Similarity	Similar Figures
			Similarity	Similar Triangles
			Similarity	When are Two Triangles Similar?
			Similarity	Prove that the Triangles are Similar
			The Right Triangle and Trigonometry	The Right Triangle and Trigonometry
			The Right Triangle and Trigonometry	Review of Pythagorean Theorem
			The Right Triangle and Trigonometry	Indirect Measurement
			The Right Triangle	Sine Ratio

			and Trigonometry	
			The Right Triangle and Trigonometry	Cosine Ratio
			The Right Triangle and Trigonometry	Tangent Ratio
			The Right Triangle and Trigonometry	Cotangent Ratio
			The Right Triangle and Trigonometry	The Fundamental Identity of Trigonometry
			The Right Triangle and Trigonometry	Identity 1
			The Right Triangle and Trigonometry	Identity 2
		9-12.G.1.2.a Definitions and postulates	Triangles	The Structure of a Triangle
			Triangles	Theorem 1
			Triangles	Classification of Triangles
			Triangles	Angle Based Classification of Triangles
			Triangles	Congruent Postulate 1 (SAS Postulate)
			Triangles	Postulate 2 (ASA Postulate)
			Triangles	Postulate 3 (SSS Postulate)
			Triangles	Postulate 4 (AAS Postulate)

			Triangles	Postulate 5 (HL Postulate)
			Special Triangles	Isosceles Triangle and its Parts
			Special Triangles	Equilateral or Equiangular Triangle
			Special Triangles	30-60-90 Triangle
			Special Triangles	45-45-90 Triangle (Isosceles Right Triangle)
		9-12.G.1.2.b Similarity theorems	Similarity	Ratios and Proportions
			Similarity	Proportions and Their Properties
			Similarity	Similar Figures
			Similarity	Similar Triangles
			Similarity	When are Two Triangles Similar?
			Similarity	Prove that the Triangles are Similar
		9-12.G.1.2.c Congruence theorems	Triangles	Congruence of Geometric Figures
			Triangles	Congruent Postulate 1 (SAS Postulate)
			Triangles	Postulate 2 (ASA Postulate)
			Triangles	Postulate 3 (SSS Postulate)
			Triangles	Postulate 4 (AAS Postulate)

			Triangles Special Triangles	Postulate 5 (HL Postulate) When Two Equilateral Triangles Are Congruent
	9-12.G.2 Use properties of geometric figures to solve problems from a variety of perspectives.	**9-12.G.2.1** Students are able to recognize the relationship between a three-dimensional figure and its two-dimensional representation.		
		9-12.G.2.1.a Interpret floor plans		
		9-12.G.2.1.b Follow instructions for assembly of a product, e.g., "some assembly required."		
		9-12.G.2.2 Students are able to reflect across vertical or horizontal lines, and translate two-dimensional figures.		
		9-12.G.2.2.a Identify lines of symmetry.		
		9-12.G.2.2.b Use the coordinate plane.	Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane Parallel Lines and the Coordinate Plane	Positions of Two Lines in a Plane Concurrent Lines Parallel Lines and Transversals Postulates about Parallel Lines Angles Formed by Parallel Lines and their Transversals

			Parallel Lines and the Coordinate Plane	Alternate Interior Angles
			Parallel Lines and the Coordinate Plane	Alternate Exterior Angles
			Parallel Lines and the Coordinate Plane	Corresponding Angles
			Parallel Lines and the Coordinate Plane	Important Theorems About Parallel and Transversal Lines
			Parallel Lines and the Coordinate Plane	Two Perpendicular Number Lines
			Parallel Lines and the Coordinate Plane	Properties of Points on a Coordinate Plane
			Parallel Lines and the Coordinate Plane	Construction of a Line Parallel to an Axis Through a Point
			Parallel Lines and the Coordinate Plane	Length of a Segment on a Coordinate Plane
			Parallel Lines and the Coordinate Plane	Distance Formula
			Parallel Lines and	Midpoint of a Segment

			the Coordinate Plane	
			Parallel Lines and the Coordinate Plane	How to Write the Equation of a Line
			Parallel Lines and the Coordinate Plane	Slope Form
			Parallel Lines and the Coordinate Plane	Point-Slope Form
			Parallel Lines and the Coordinate Plane	Slope-Intercept Form
			Parallel Lines and the Coordinate Plane	How to Display a Line on the Coordinate Plane
			Parallel Lines and the Coordinate Plane	Relationships Between Two Lines on a Plane
			Parallel Lines and the Coordinate Plane	Intersecting Lines
			Parallel Lines and the Coordinate Plane	Parallel Lines
			Parallel Lines and the Coordinate	Perpendicular Lines

			Plane	
		9-12.G.2.3 Students are able to use proportions to solve problems.	Similarity	Ratios and Proportions
			Similarity	Proportions and Their Properties
			Similarity	Similar Figures
			Similarity	Similar Triangles
			Similarity	When are Two Triangles Similar?
			Similarity	Prove that the Triangles are Similar
			Similarity	Similar Quadrilaterals
9-12.M Measurement	**9-12.M.1** Apply measurement concepts in practical applications.	**9-12.M.1.1** Students are able to choose appropriate unit label, scale, and precision.		
		9-12.M.1.1.a Determine appropriate scales for histograms, scatterplots, and other graphs.		
		9-12.M.1.2 Students are able to use suitable units when describing rate of change.		
		9-12.M.1.3 Students are able to use formulas to find perimeter, circumference, and area to solve problems involving common geometric figures.	Perimeters and Areas	Areas of Triangles
			Perimeters and Areas	Area of Polygon
			Perimeters and Areas	Perimeter of Regular Polygon
			Perimeters and	Area and Perimeter of a Square

			Areas	
			Perimeters and Areas	Area and Perimeter of Rectangle
			Perimeters and Areas	Area and Perimeter of the Parallelogram
			Perimeters and Areas	Area and Perimeter of Rhombus Area and Perimeter of Trapezoid
			Perimeters and Areas	Circumference of a Circle
			Perimeters and Areas	Area of a Circle
			Perimeters and Areas	Sector of a Circle and Its Area
		9-12.M.1.3.a Use algebraic expressions with geometric formulas.	Reasoning and Intro to Proof	Using Algebraic Properties in Geometric Proofs
			Reasoning and Intro to Proof	Geometric Postulates
			Reasoning and Intro to Proof	A Sample Geometric Proof Using Algebraic Postulates
			Parallel Lines and the Coordinate Plane	Length of a Segment on a Coordinate Plane
			Parallel Lines and the Coordinate Plane	Distance Formula
9-12.N Number Sense	**9-12.N.1** Analyze the structural	**9-12.N.1.1** Students are able to identify		

	characteristics of the real number system and its various subsystems. Analyze the concept of value, magnitude, and relative magnitude of real numbers.	multiple representations of a real number.		
		9-12.N.1.1.a Given a real number identify the subset(s) of real numbers to which it belongs.		
		9-12.N.1.1.b Represent rational and irrational numbers in different forms.		
		9-12.N.1.2 Students are able to apply the concept of place value, magnitude, and relative magnitude of real numbers.		
		9-12.N.1.2.a Scientific notation		
		9-12.N.1.2.b Infinitely many solutions		
		9-12.N.1.2.c Completeness of the real numbers (density, i.e., between any two real numbers is another real number)		
	9-12.N.2 Apply number operations with real numbers and other number systems.	**9-12.N.2.1** Students are able to add, subtract, multiply, and divide real numbers including integral exponents.		
	9-12.N.3 Develop conjectures, predictions, or estimations to solve problems and verify or justify the results.	**9-12.N.3.1** Students are able to use estimation strategies in problem situations to predict results and to check the reasonableness of results.		
		9-12.N.3.1.a Use rounding as an estimation strategy.		
		9-12.N.3.1.b Use non-routine estimation strategies.		
		9-12.N.3.2 Students are able to select alternative computational strategies and explain the chosen strategy.		
		9-12.N.3.2.a Use properties of numbers that allow operational shortcuts for computational procedures.		
9-12.S Statistics and Probability	**9-12.S.1** Use statistical models to gather, analyze, and display data to draw conclusions.	**9-12.S.1.1** Students are able to draw conclusions from a set of data.		
		9-12.S.1.1.a Determine and use appropriate statistical values.		

		9-12.S.1.1.b Determine which questions can or cannot be answered from a given data set.		
		9-12.S.1.2 Students are able to compare multiple one-variable data sets, using range, interquartile range, mean, mode, and median.		
		9-12.S.1.3 Represent a set of data in a variety of graphical forms and draw conclusions.		
		9-12.S.1.3.a Make a scatterplot to draw a regression line and make predictions.		
		9-12.S.1.3.b Make a box-and-whisker plot to model a set of one-variable data.		
		9-12.S.1.3.c Make a histogram from a frequency distribution.		
	9-12.S.2 Apply the concepts of probability to predict events/outcomes and solve problems.	**9-12.S.2.1** Students are able to distinguish between experimental and theoretical probability.		
		9-12.S.2.2 Students are able to predict outcomes of simple events using given theoretical probabilities.		
		9-12.S.2.2.a Determine the sample space of an experiment.		