AVENTA LEARNING

Alignment Document
State of Wyoming and Aventa Learning Calculus

Calculus

Standards	Benchmarks	Unit Name	Course Topic Description
1 Students use numbers, number sense, and number relationships in a problem-solving situation.	**1.1** Students represent and apply real numbers in a variety of forms.	Covered throughout the course	
	1.2 Students apply the structure and properties of the real number system.	Covered throughout the course	
	1.3 Students explain their choice of estimation and problem solving strategies and justify results of solutions in problem-solving situations involving real numbers.	Limits and Their Properties Differentiation Applications of Differentiation Applications of Differentiation	Finding Limits Graphically, Numerically and Analytically Implicit Differentiation Derivative Tests, Limits, and Graphs Optimization, Newton's Method and Differentials
	1.4 Students use proportional reasoning to solve problems.	Differentiation	Implicit Differentiation
2 Students apply geometric concepts, properties, and relationships in a problem-solving situation.	**2.1** Students use transformations, congruency, symmetry, similarity, perpendicularity, parallelism, and the Pythagorean Theorem to solve problems.	Differentiation Applications of Differentiation	Implicit Differentiation Extrema and the Mean Value Theorem
	2.2 Students communicate, using mathematical language, to:		
	2.2.a Interpret, represent, or create geometric figures;	Limits and Their Properties Differentiation Differentiation	Linear Models and Rates of Change The Derivative Implicit Differentiation

		Applications of Differentiation	Extrema and the Mean Value Theorem
		Applications of Differentiation	Optimization, Newton's Method and Differentials
		Integration	Area, Reimann Sums and Definite Integrals
		Applications of Integration	Area of a Region Between Two Curves
		Applications of Integration	Volumes, Arc Lengths, and Surfaces
	2.2.b Draw or build figures from a mathematical description;	Applications of Integration	Area of a Region Between Two Curves
		Applications of Integration	Volumes, Arc Lengths, and Surfaces
	2.2.c Analyze properties and determine attributes of 2- and 3-dimensional objects.	Applications of Integration	Volumes, Arc Lengths, and Surfaces
	2.3 Students communicate the reasoning used in identifying geometric relationships in problem-solving situations.	Differentiation	Implicit Differentiation
		Applications of Differentiation	Extrema and The Mean Value Theorem
		Integration	The Fundamental Theorem of Calculus
	2.4 Students solve problems involving the coordinate plane such as the distance between two points, the midpoint, and slope.	Limits and Their Properties	Linear Models and Rates of Change
		Differentiation	The Derivative
		Applications of Differentiation	Extrema and The Mean Value Theorem
	2.5 Students connect geometry with other mathematical topics.	Differentiation	Implicit Differentiation
		Applications of Integration	Area of a Region Between Two Curves
		Applications of Integration	Volumes, Arc Lengths, and Surfaces
3 Students use a variety of tools and techniques of measurement in a problem-solving situation.	**3.1** Students apply estimation and measurement using the appropriate methods and units to solve problems involving length, weight/mass, area, surface area, volume, and angle measure.	Differentiation	Implicit Differentiation
		Applications of Integration	Area of a Region Between Two Curves
		Applications of Integration	Volumes, Arc Lengths, and Surfaces

		Applications of Integration	Work, Moments and Fluids
	3.2 Students demonstrate an understanding of both metric and U. S. customary systems. Students are able to convert within each system.	Differentiation	Implicit Differentiation
	3.3 Students identify and apply scale, ratios, and proportions in solving measurement problems.	Differentiation Integration	Implicit Differentiation Area, Reimann Sums and Definite Integrals
	3.4 Students solve problems of angle measure including those involving polygons or parallel lines cut by a transversal.		
	3.5 Students solve indirect measurement problems.	Differentiation	Implicit Differentiation
4 Students use algebraic methods to investigate, model, and interpret patterns and functions involving numbers, shapes, data, and graphs in a problem-solving situation.	**4.1** Students use algebraic concepts, symbols, and skills to represent and solve real-world problems.	Limits and Their Properties Differentiation Logarithmic, Exponential, and Other Transcendental Functions Logarithmic, Exponential, and Other Transcendental Functions	Linear Models and Rates of Change Implicit Differentiation The Natural Logarithmic Function Inverse Functions and Exponential Functions
	4.2 Students write, model, and evaluate expressions, functions, equations, and inequalities.	Covered throughout the course	
	4.3 Students graph linear equations and interpret the results in solving algebraic problems.	Limits and Their Properties Differentiation Applications of Differentiation	Linear Models and Rates of Change The Derivative Optimization, Newton's Method and Differentials
	4.4 Students solve, graph, or interpret systems of linear equations.	Differentiation Applications of Differentiation	Implicit Differentiation Optimization, Newton's Method and Differentials
	4.5 Students connect algebra with other	Covered throughout the course	

	mathematical topics.		
5 Students use data analysis and probability to analyze given situations and the results of experiments.	**5.1** Students apply knowledge of mean, median, mode, and range to interpret and evaluate information and data.		
	5.2 Students draw reasonable inferences from statistical data and/or correlation/best fit line to predict outcomes.		
	5.3 Students communicate about the likelihood of events using concepts from probability.		
	5.3.a sample space		
	5.3.b evaluate simple probabilities		
	5.3.c evaluate experimental vs. theoretical		
	5.4 Students determine, collect, organize, and analyze relevant data needed to make conclusions.		