Unit	Lesson	Lesson Objectives
Precalculus Review		
	Introduction to AP Calculus	
	Writing Two-Variable Linear Equations	
		Create linear equations given information about points, slope, and intercepts.
		Solve problems by writing two-variable linear equations.
	Reading Lesson 1.1	
	Composition of Functions	
		Evaluate the composition of functions.
		Find the domain of the composition of functions.
		Write an expression for the composition of functions.
	Symmetry	
		Determine the symmetry of a function algebraically.
		Determine the symmetry of a relation from a graph.
	Piecewise Defined Functions	
		Determine the domain, range, and continuity of piecewise defined functions.
		Evaluate piecewise defined functions.
		Graph piecewise defined functions.
	Reading Lesson 1.2	
	Graphing Exponential Functions	
		Determine the domain and range of exponential functions.
		Graph exponential functions.
		Identify exponential functions.
	Base *e*	
		Analyze exponential and logarithmic functions in base e to determine key features of the graph.
		Apply properties of logarithms and exponents to solve exponential and logarithmic equations having base e.
		Determine the domain and range of exponential and logarithmic functions in base e.
	Modeling with Exponential and Logarithmic Equations	
		Model and solve real-world problems using exponential and logarithmic functions.
	Reading Lesson 1.3	
	Parametric Equations	
		Define curves parametrically.
		Determine the Cartesian equation that contains a given parametric equation.
		Graph parametric equations.
	Reading Lesson 1.4	

Unit	Lesson	Lesson Objectives
	Function Inverses	
		Find the inverse of a function.
		Use composition to verify that functions are inverses.
	Graphing Logarithmic Functions	
		Determine the domain and range of logarithmic functions.
		Identify and analyze the graphs of logarithmic functions.
		Identify logarithmic functions.
	Properties of Logarithms	
		Evaluate, expand, and simplify logarithmic expressions using properties of logarithms.
	Reading Lesson 1.5	
	Radian Measure	
		Convert between degree and radian measure.
		Use the definition of radian measure to calculate arc lengths, radii, and angle measures.
	Evaluating the Six Trigonometric Functions	
		Evaluate the six trigonometric functions for angles in degrees or radians based on one or more given trigonometric function values.
		Evaluate the six trigonometric functions for angles in degrees or radians given a point on the terminal ray.
	Solving Trigonometric Equations	
		Analyze key features of inverse trigonometric functions from equations and graphs.
		Evaluate inverse trigonometric functions over a specified domain.
		Solve trigonometric equations over a specified domain.
	Modeling with Periodic Functions	
		Model and solve real-world problems using periodic functions.
	Reading Lesson 1.6	
	Unit Test	
		Analyze exponential and logarithmic functions in base e to determine key features of the graph.
		Analyze key features of inverse trigonometric functions from equations and graphs.
		Apply properties of logarithms and exponents to solve exponential and logarithmic equations having base e.
		Define curves parametrically.
		Determine the domain, range, and continuity of piecewise-defined functions.
		Determine the symmetry of a function algebraically.
		Evaluate the six trigonometric functions for angles in degrees or radians based on one or more given trigonometric function values.
		Evaluate, expand, and simplify logarithmic expressions using properties of logarithms.
		Find the domain of the composition of functions.
		Model and solve real-world problems using exponential and logarithmic functions.
		Model and solve real-world problems using periodic functions.
		Solve trigonometric equations over a specified domain.

Unit	Lesson	Lesson Objectives
Limits and Continuity		
	Introduction to Unit 2	
	Rates of Change, Limits, and the Squeeze Theorem	
		Compare average speed to instantaneous speed.
		Define the limit of a function and the properties of limits.
		Determine average speed.
		Determine one-sided and two-sided limits of functions.
		Identify conditions under which a limit does and does not exist.
		Use the squeeze theorem to indirectly find limits.
	Reading Lesson 2.1	
	Limits Involving Infinity and Vertical and Horizontal Asymptotes	
		Calculate limits as x goes to positive and negative infinity.
		Determine end behavior of a function using limits.
		Find vertical and horizontal asymptotes using limits.
	Reading Lesson 2.2	
	Continuous Functions and Intermediate Value Theorem	
		Identify intervals of continuity and discontinuity over intervals of a function.
		Identify types of discontinuity, including jump, infinite, and oscillating.
		Modify or extend a function to remove discontinuities.
		Use properties of continuous functions to determine function continuity over algebraic combinations.
		Use the intermediate value theorem to verify continuity.
	Reading Lesson 2.3	
	Slope, Tangent Line, and Normal Line	
		Calculate the average rate of change of a function.
		Determine the equation of the normal line to a curve at a given point.
		Determine the equation of the tangent line to a curve at a given point.
		Determine the slope of the tangent line at a point using limits.
	Reading Lesson 2.4	
	Unit Test	
		Calculate limits as x goes to positive and negative infinity.
		Calculate the average rate of change of a function.
		Compare average speed to instantaneous speed.
		Define the limit of a function and the properties of limits.
		Determine average speed.
		Determine end behavior of a function using limits.
		Determine one-sided and two-sided limits of functions.

Unit	Lesson	Lesson Objectives
	Unit Test *(cont'd)*	
		Determine the equation of the normal line to a curve at a given point.
		Determine the equation of the tangent line at a given point.
		Determine the slope of the tangent line at a point using limits.
		Find vertical and horizontal asymptotes using limits.
		Identify conditions when a limit does and does not exist.
		Identify intervals of continuity and discontinuity over intervals of a function.
		Identify types of discontinuity, including jump, infinite, and oscillating.
		Modify or extend a function to remove discontinuities.
		Use properties of continuous functions to determine function continuity after algebraic combinations.
		Use the intermediate value theorem to verify continuity.
		Use the sandwich theorem to find limits indirectly.
Derivatives		
	Introduction to Unit 3	
	Derivatives of Functions	
		Approximate the derivative of a function from a given data set.
		Calculate the derivative of a function at a point.
		Determine if a function is differentiable on a closed interval.
		Determine the derivative of a function using the definition of a derivative.
		Sketch a graph of a function when given the graph of its derivative.
		Sketch a graph of the derivative of a function when given its graph.
	Reading Lesson 3.1	
	Derivatives and Continuity	
		Estimate derivatives using graphs and numerical approximation.
		Identify different types of non-differentiable points, including discontinuities, vertical tangents, corners, and cusps.
	Reading Lesson 3.2	
	Differentiation Rules	
		Calculate instantaneous rate of change using the derivative.
		Calculate second derivatives and higher-order derivatives using rules of differentiation.
		Use the power rule to find derivatives.
		Use the product rule to find derivatives.
		Use the quotient rule to find derivatives.
	Reading Lesson 3.3	

Unit	Lesson	Lesson Objectives
	Applications of Derivatives	
		Solve real-world problems involving rates of change using derivatives.
		Use derivatives to solve problems involving motion in a straight line.
	Reading Lesson 3.4	
	Differentiating Trigonometric Functions	
		Determine derivatives of trigonometric functions.
	Reading Lesson 3.5	
	AP Multiple Choice/Free Response	
	Unit Test	
		Calculate second derivatives and higher order derivatives using rules of differentiation.
		Compute the derivative of a function at a point.
		Compute the derivative of a function using the definition of a derivative.
		Determine if a function is differentiable on a closed interval.
		Determine the derivatives of the six basic trigonometric functions using the rules of differentiation.
		Estimate derivatives using graphs and numerical approximation.
		Identify different types of non-differentiable points, including discontinuities, vertical tangents, corners, and cusps.
		Sketch a graph of a function when given the graph of its derivative.
		Sketch a graph of the derivative of a function when given a data set.
		Sketch a graph of the derivative of a function when given its graph.
		Solve real-world problems involving rates of change using derivatives.
		Use derivatives to solve problems involving motion in a straight line.
		Use the power rule to find derivatives.
		Use the product rule to find derivatives.
		Use the quotient rule to find derivatives.
More Derivatives		
	Introduction to Unit 4	
	Differentiating Functions Using the Chain Rule	
		Apply the chain rule to find the derivative of a composite function.
		Use the chain rule to determine the slopes of curves defined parametrically.
	Reading Lesson 4.1	
	Differentiating Functions Using Implicit Differentiation	
		Determine derivatives using implicit differentiation.
		Use the power rule to find the derivative of a function raised to a rational power of x.
	Reading Lesson 4.2	

Unit	Lesson	Lesson Objectives
	Differentiating Functions Containing Inverse Trigonometric Functions	
		Determine derivatives of inverse functions using the chain rule.
		Determine derivatives of inverse trigonometric function.
	Reading Lesson 4.3	
	Differentiating Exponential and Logarithmic Functions	
		Calculate derivatives of exponential functions with a base of e .
		Calculate derivatives of exponential functions with a base other than e .
		Calculate derivatives of logarithmic functions with a base other than e .
		Calculate derivatives of natural logarithmic functions.
	Reading Lesson 4.4	
	Unit 4 AP Practice Questions	
	Unit Test	
		Apply the chain rule to find the derivative of a composite function.
		Determine derivatives of exponential functions with a base of e .
		Determine derivatives of exponential functions with a base other than e .
		Determine derivatives of inverse functions using the chain rule.
		Determine derivatives of inverse trigonometric functions.
		Determine derivatives of logarithmic functions with a base other than e .
		Determine derivatives of natural logarithmic functions.
		Determine derivatives using implicit differentiation.
		Use the chain rule to determine the slope of curves defined parametrically.
		Use the power rule to find the derivative of a function raised to a rational power of x .
Applications of Derivatives		
	Introduction to Unit 5	
	Relative and Absolute Extrema	
		Determine critical points of a function.
		Determine if the extreme value theorem applies to a function on a specific interval.
		Identify the absolute minimum and maximum values of a function.
		Identify the relative minimum and maximum values of a function.
	Reading Lesson 5.1	
	The Mean Value Theorem	
		Determine increasing and decreasing intervals of a function.
		Use the mean value theorem to determine the value where the derivative is equal to the average rate of change.
	Reading Lesson 5.2	

Unit	Lesson	Lesson Objectives
	First and Second Derivative Test	
		Use the first and second derivative tests to graph $f(x)$ from $f'(x)$.
		Use the first derivative test to determine relative extrema.
		Use the second derivative test to determine concavity and points of inflection.
	Reading Lesson 5.3	
	Application Problem Solving	
		Solve optimization problems using derivatives.
	Reading Lesson 5.4	
	Newton's Method, Linearization, and Differentials	
		Apply Newton's method to approximate zeros of a function.
		Approximate the change in f using differentials.
		Use linearization to approximate tangent lines.
	Reading Lesson 5.5	
	Application of Implicit Differentiation	
		Use implicit differentiation to solve related rate problems.
	Reading Lesson 5.6	
	Unit 5 AP Practice Questions	
	Unit Test	
		Determine critical points of a function.
		Determine increasing and decreasing intervals of a function.
		Identify the relative maximum and minimum values of a function.
		Solve optimization problems using derivatives.
		Use the extreme value theorem to determine if a function is continuous.
		Use the first and second derivative test to graph f from f'.
		Use the first derivative test to determine relative extrema.
		Use the mean value theorem to determine the value where the derivative is equal to the average change.
		Use the second derivative test to determine concavity and points of inflection.
		Approximate the change in f using differentials.
		Use implicit differentiation to solve related rate problems.
		Use linearization to approximate tangent lines.
Definite Integrals		
	Introduction to Unit 6	
	Estimating with Finite Sums	
		Approximate a distance using area under a velocity curve.
		Approximate the area under a curve by using left, right, and midpoint sums.
		Solve accumulation problems by approximating the area under a curve.

Unit	Lesson	Lesson Objectives
	Reading Lesson 6.1: Estimating with Finite Sums	
	Definite Integrals	
		Evaluate a definite integral using an area formula.
		Evaluate definite integrals of functions with discontinuities.
		Use definite integrals to solve problems involving accumulation.
		Use integral notation to express a limit of Riemann sums.
	Reading Lesson 6.2: Definite Integrals	
	Definite Integrals and Antiderivatives	
		Apply the mean value theorem to determine a point at which a function assumes its average value over a closed interval.
		Calculate the area under a curve using antidifferentiation.
		Solve problems using the properties of definite integrals.
	Reading Lesson 6.3: Definite Integrals and Antiderivatives	
	Fundamental Theorem of Calculus, Parts 1 and 2	
		Use the first part of the fundamental theorem of calculus to solve problems.
		Use the second part of the fundamental theorem of calculus to solve problems.
	Reading Lesson 6.4: Fundamental Theorem of Calculus	
	Trapezoidal Rule	
		Approximate the area under a curve using the trapezoidal rule.
		Compare the trapezoidal rule to other area approximations including left, right, and midpoint sums.
	Reading Lesson 6.5: Trapezoidal Rule	
	Unit 6 AP Practice Questions	
	Unit Test	
		Apply the mean value theorem to determine a point at which a function assumes its average value over a closed interval.
		Approximate a distance using area under a velocity curve.
		Approximate the area under a curve by using left, right, and midpoint sums.
		Approximate the area under a curve using the trapezoidal rule.
		Calculate the area under a curve using antidifferentiation.
		Compare the trapezoidal rule to other area approximations including left, right, and midpoint sums.
		Evaluate a definite integral using an area formula.
		Evaluate definite integrals of functions with discontinuities.
		Solve accumulation problems by approximating the area under a curve.
		Solve problems using the properties of definite integrals.
		Use definite integrals to solve problems involving accumulation.
		Use integral notation to express a limit of Riemann sums.
		Use the first part of the fundamental theorem of calculus to solve problems.
		Use the second part of the fundamental theorem of calculus to solve problems.

Unit	Lesson	Lesson Objectives
Mathematical Modeling Using Differential Equations		
	Introduction to Unit 7	
	Slope Fields	
		Use a slope field to find a graphical solution for a given differential equation.
		Use initial conditions to find solutions to differential equations.
	Reading Lesson 7.1: Slope Fields and Euler's Method	
	Antidifferentiation by Substitution	
		Evaluate indefinite integrals without using substitution.
		Use substitution as a method of evaluating indefinite and definite integrals.
		Verify an antiderivative formula.
	Reading Lesson 7.2: Antidifferentiation by Substitution	
	Exponential Growth and Decay	
		Predict temperatures by using Newton's law of cooling.
		Use exponential functions to model growth and decay.
		Use separation of variables to solve initial value problems.
	Reading Lesson 7.4: Exponential Growth and Decay	
	Unit 7 AP Practice Questions	
	Unit Test	
		Evaluate indefinite integrals without using substitution.
		Use a slope field to find a graphical solution for a given differential equation.
		Use exponential functions to model growth and decay.
		Use initial conditions to find solutions to differential equations.
		Use separation of variables to solve initial value problems.
		Use substitution as a method of evaluating indefinite and definite integrals.
		Verify an antiderivative formula.
Applications of Definite Integrals		
	Introduction to Unit 8	
	Integral as Net Change	
		Calculate the displacement of an object from a given velocity function.
		Calculate the total distance an object travels from a given velocity function.
		Express the net change of a quantity as a definite integral.
		Find the net change of a quantity from a rate of change that is given in graphical or tabular form.
		Find the net, or accumulated, change of a quantity from a rate of change function.
	Reading Lesson 8.1: Accumulation and Net Change	

Unit	Lesson	Lesson Objectives
	Areas in the Plane	
		Calculate the area between two curves defined by only two functions and over a closed interval by integrating with respect to *x* .
		Calculate the area between two curves defined by only two functions and over a closed interval by integrating with respect to *y* .
		Use subregions to calculate the area between two curves over a closed interval.
	Reading Lesson 8.2: Areas in the Plane	
	Volumes	
		Find the volume of a solid generated by revolving a line or curve around a given line.
		Find the volume of a solid generated by revolving a region bounded by two or more lines or curves around a given line.
		Find the volume of a solid with known cross sections.
		Use a definite integral to express the volume of a solid.
	Reading Lesson 8.3: Volumes	
	Applications from Science and Statistics	
		Use the definite integral to solve problems involving fluid pressure.
		Use the definite integral to solve problems involving probabilities.
		Use the definite integral to solve problems involving work.
	Reading Lesson 8.5: Applications from Science and Statistics	
	L'Hôpital's Rule and Other Applications	
		Apply L'Hôpital's rule to evaluate the limit of an indeterminate form.
		Compare the growth rates of functions.
	Reading Lesson 9.2 and 9.3: L'Hôpital's Rule and Other Applications	
	Unit 8 AP Practice Questions	
	Unit Test	
		Apply L'Hôpital's rule to evaluate the limit of an indeterminate form.
		Calculate the area between two curves defined by only two functions and over a closed interval by integrating with respect to *x* .
		Calculate the area between two curves defined by only two functions and over a closed interval by integrating with respect to *y* .
		Calculate the displacement of an object from a given velocity function.
		Calculate the total distance an object travels from a given velocity function.
		Compare the growth rates of functions.
		Express the net change of a quantity as a definite integral.
		Find the net change of a quantity from a rate of change that is given in graphical or tabular form.
		Find the net, or accumulated, change of a quantity from a rate of change function.
		Find the volume of a solid generated by revolving a line or curve around a given line.
		Find the volume of a solid generated by revolving a region bounded by two or more lines or curves around a given line.
		Find the volume of a solid with known cross sections.
		Use a definite integral to express the volume of a solid.
		Use subregions to calculate the area between two curves over a closed interval.

Unit	Lesson	Lesson Objectives
Review		
	Preparing for the Exam	
	Review: Limits and Continuity	
	Review: Derivatives	
	Review: Applications of Derivatives	
	Review: Integrals	
	Review: Applications of Integrals	
	Review: Differential Equations	
	Practice Exam 1 – Part A	
		Analyze differential equations to obtain general and specific solutions.
		Analyze functions defined by an integral.
		Analyze functions for intervals of continuity or points of discontinuity.
		Apply definite integrals to problems involving the average value of a function.
		Calculate a definite integral using areas and properties of definite integrals.
		Calculate antiderivatives.
		Calculate derivatives.
		Deduce and interpret behavior of functions using limits.
		Determine higher-order derivatives.
		Determine limits of functions.
		Determine the applicability of important calculus theorems using continuity.
		Estimate limits of functions.
		Evaluate definite integrals.
		Express limits symbolically using correct notation.
		Express the limit of a Riemann sum in integral notation.
		Identify the derivative of a function as the limit of a difference quotient.
		Interpret limits expressed symbolically.
		Interpret the definite integral as the limit of a Riemann sum in integral notation.
		Interpret the meaning of a definite integral within a problem.
		Interpret the meaning of a derivative within a problem.
		Recognize antiderivatives of basic functions.
		Recognize the connection between differentiability and continuity.
		Solve problems involving slope of a tangent line.
		Verify solutions to differential equations.

Unit	Lesson	Lesson Objectives
	Practice Exam 1 – Part B	
		Apply definite integrals to problems involving areas and volume.
		Apply definite integrals to problems involving motion.
		Apply the Mean Value Theorem to describe the behavior of a function over an interval.
		Approximate a definite integral.
		Estimate derivatives.
		Estimate solutions to differential equations.
		Interpret, create, and solve differential equations from problems in contexts.
		Solve problems involving rates of change in applied contexts.
		Solve problems involving related rates, optimization, and rectilinear motion.
		Solve problems involving slope of a tangent line.
		Use derivatives to analyze properties of a function.
		Use the definite integral to solve problems in various contexts.
	Practice Exam 1 – Free Response Section	
	Practice Exam 2 – Part A	
		Analyze differential equations to obtain general and specific solutions.
		Analyze functions defined by an integral.
		Analyze functions for intervals of continuity or points of discontinuity.
		Apply definite integrals to problems involving the average value of a function.
		Calculate a definite integral using areas and properties of definite integrals.
		Calculate antiderivatives.
		Calculate derivatives.
		Deduce and interpret behavior of functions using limits.
		Determine higher-order derivatives.
		Determine limits of functions.
		Determine the applicability of important calculus theorems using continuity.
		Estimate limits of functions.
		Evaluate definite integrals.
		Express limits symbolically using correct notation.
		Express the limit of a Riemann sum in integral notation.
		Identify the derivative of a function as the limit of a difference quotient.
		Interpret limits expressed symbolically.
		Interpret the definite integral as the limit of a Riemann sum in integral notation.
		Interpret the meaning of a definite integral within a problem.
		Interpret the meaning of a derivative within a problem.

Unit	Lesson	Lesson Objectives
		Practice Exam 2 – Part A *(cont'd)*
		Recognize antiderivatives of basic functions.
		Recognize the connection between differentiability and continuity.
		Solve problems involving slope of a tangent line.
		Verify solutions to differential equations.
		Practice Exam 2 – Part B
		Apply definite integrals to problems involving areas and volume.
		Apply definite integrals to problems involving motion.
		Apply the Mean Value Theorem to describe the behavior of a function over an interval.
		Approximate a definite integral.
		Estimate derivatives.
		Estimate solutions to differential equations.
		Interpret, create, and solve differential equations from problems in contexts.
		Solve problems involving rates of change in applied contexts.
		Solve problems involving related rates, optimization, and rectilinear motion.
		Solve problems involving slope of a tangent line.
		Use derivatives to analyze properties of a function.
		Use the definite integral to solve problems in various contexts.
		Practice Exam 2 – Free Response Section