

## Calculus

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
A.C.1	Apply the concepts of limits, asymptotic and unbounded behavior and continuity to functions.	Graph Behavior	Asymptotes and End Behavior Increasing/Decreasing Behavior and Concavity
A.C.1.1	Define and apply the properties of limits of functions.	Limits and Continuity	Concept of a Limit
A.C.1.2	Investigate asymptotic and unbounded behavior in functions.	Graph Behavior	Asymptotes and End Behavior Increasing/Decreasing Behavior and Concavity
A.C.1.3	Use limits to define continuity and determine if a function is continuous.	Limits and Continuity	Continuity
A.C.2	Analyze, calculate and apply the concept of a derivative.	Derivatives	Concept of a Derivative
A.C.2.1	Investigate derivatives presented in numerical, graphic and various analytic contexts.	Derivatives Derivative Applications	Motion Along a Line Rates of Change, Related Rates, Optimization, Mean Value and Rolle's Theorems
A.C.2.2	Investigate and apply the concepts of $f$ , $f'$ and $f''$ to describe the characteristics of a function and its graph.	Derivatives	Graphs of $f$ and $f'$
A.C.2.3	Apply derivatives to solve problems in various applications including distance, velocity, and acceleration and optimization problems.	Derivatives Derivative Applications	Motion Along a Line Rates of Change, Related Rates, Optimization, Mean Value and Rolle's Theorems
A.C.2.4	Apply formulas to find derivatives both implicitly and explicitly, including using the product, quotient and chain rules.	Differentiation	Product, Quotient, and Chain Rules

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A.C.3	Analyze, calculate and apply the concept of an integral using.	The Definite Integral	Throughout Unit
A.C.3.1	Explore Riemann sums and other approximation techniques and apply them to approximate definite integrals.	The Definite Integral	Area and Riemann Sums
A.C.3.2	Identify and use the properties of integrals.	The Definite Integral Integral Applications	Throughout Units
A.C.3.3	Use the Fundamental Theorem of Calculus to evaluate definite integrals and represent a particular anti-derivative.	The Definite Integral	Fundamental Theorem of Calculus
A.C.3.4	Find anti-derivatives directly from derivatives of basic functions and by the method of u-substitution.	The Definite Integral	Substitution Rule and Definite Integrals
A.C.3.5	Use integrals to evaluate volumes of revolution and volumes of known cross-sections.	Area and Volume	Volumes of Solids and Revolution Volumes of Solids Using Cross Sections
A.C.3.6	Use initial conditions with separable differential equations to solve for specific anti-derivatives.	Antidifferentiation	Initial Value Problems

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A.C.3.7	Use differential equations to produce slope fields and solve for specific equations using initial conditions.	Antidifferentiation	Slope Fields
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