

Davison Community Schools
Brief Calculus

Course Outline

Unit 1: Limits

- Continuity
- Rates of Change
- Definition of the Derivative

Unit 2: Techniques for Finding the Derivative

- Derivatives of Products and Quotients
- The Chain Rule
- Derivatives of Exponential Functions
- Derivatives of Logarithmic Functions

Unit 3: Increasing and Decreasing Functions

- Relative Extrema
- Higher Derivatives, Concavity and the Second Derivative Test
- Curve Sketching

Unit 4: Absolute Extrema

- Applications of Extrema
- Further Applications of the Derivative
- Implicit Differentiation
- Related Rates
- Differentials: Linear Approximations

Unit 5: Antiderivatives

- Substitution
- Area and the Definite Integral
- The Fundamental Theorem of Calculus
- The Area Between Two Curves
- Numerical Integration

Priority Standards

LO 1.1A	Express limits symbolically using correct notation.
LO 1.1A(b)	Interpret limits expressed symbolically.
LO 1.1B	Estimate limits of functions.
LO 1.1C	Determine limits of functions.
LO 1.1D	Deduce and interpret behavior of functions using limits.
LO 1.2A	Analyze functions for intervals of continuity or points of discontinuity.
LO 1.2B	Determine the applicability of important calculus theorems using continuity.

LO 2.1A	Identify the derivative of a function as the limit of a difference quotient.
LO 2.1B	Estimate derivatives.
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.3B	Solve problems involving the slope of a tangent line.
LO 2.1A	Identify the derivative of a function as the limit of a difference quotient.
LO 2.1B	Estimate derivatives.
LO 2.3B	Solve problems involving the slope of a tangent line.
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.1C	Calculate derivatives.
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.3B	Solve problems involving the slope of a tangent line.
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LO 2.1C	Calculate derivatives.
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.3B	Solve problems involving the slope of a tangent line.
LO 2.2A	Use derivatives to analyze properties of a function.
LO 2.2B	Recognize the connection between differentiability and continuity.
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LO 2.2B	Recognize the connection between differentiability and continuity.

LO 2.1D	Determine higher order derivatives.
LO 2.2A	Use derivatives to analyze properties of a function.
LO 2.2B	Recognize the connection between differentiability and continuity.
LO 2.2A	Use derivatives to analyze properties of a function.
LO 2.2B	Recognize the connection between differentiability and continuity
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.3C	Solve problems involving related rates and optimization.
LO 2.1C	Calculate derivatives.
LO 2.3A	Interpret the meaning of a derivative within a problem.
LO 2.3C	Solve problems involving related rates and optimization.
LO 2.3D	Solve problems involving rates of change in applied contexts.
LO 3.1A	Recognize antiderivatives of basic functions.
LO 3.1A	Recognize antiderivatives of basic functions.
LO 3.2A(a)	Interpret the definite integral as the limit of a Riemann sum.
LO 3.2A(b)	Express the limit of a Riemann sum in integral notation.
LO 3.2C	Calculate a definite integral using areas and properties of definite integrals.
LO 3.2C	Calculate a definite integral using areas and properties of definite integrals.
LO 3.3B(a)	Calculate antiderivatives.
LO 3.3B(b)	Evaluate definite integrals.
LO 3.4A	Interpret the meaning of a definite integral within a problem.
LO 3.4D	Apply definite integrals to problems involving area.