

Calculus of a Single Variable

Grade Level 12th

Topic/Content/Skills	Time weeks
P. Preparation for Calculus P.1 Graphs and Models P.2 Linear Models and Rates of Change P.3 Functions and Their Graphs P.4 Fitting Models to Data	2
1. Limits and Their Properties 1.1 A Preview of Calculus 1.2 Finding Limits Graphically and Numerically 1.3 Evaluating Limits Analytically 1.4 Continuity and One-Sided Limits 1.5 Infinite Limits	2
2. Differentiation 2.1 The Derivative and the Tangent Line Problem 2.2 Basic Differentiation Rules and Rates of Change 2.3 The Product and Quotient Rules and Higher-Order Derivatives 2.4 The Chain Rule 2.5 Implicit Differentiation 2.6 Related Rates	6
3. Applications of Differentiation 3.1 Extrema on an Interval 3.2 Rolle's Theorem and the Mean Value Theorem 3.3 Increasing and Decreasing Functions and the First Derivative Test 3.4 Concavity and the Second Derivative Test 3.5 Limits at Infinity 3.6 A Summary of Curve Sketching 3.7 Optimization Problems 3.8 Newton's Method 3.9 Differentials	7
4. Integration 4.1 Antiderivatives and Indefinite Integration 4.2 Area 4.3 Riemann Sums and Definite Integrals 4.4 The Fundamental Theorem of Calculus 4.5 Integration by Substitution 4.6 Numerical Integration	3
5. Logarithmic, Exponential, and Other Transcendental Functions 5.1 The Natural Logarithmic Function: Differentiation 5.2 The Natural Logarithmic Function: Integration 5.3 Inverse Functions 5.4 Exponential Functions: Differentiation and Integration 5.5 Bases Other than e and Applications 5.6 Inverse Trigonometric Functions: Differentiation 5.7 Inverse Trigonometric Functions: Integration	3
6. Differential Equations 6.1 Slope Fields and Euler's Method 6.2 Differential Equations: Growth and Decay 6.3 Separation of Variables and the Logistic Equation	2
7. Applications of Integration 7.1 Area of a Region Between Two Curves	

7.2 Volume: The Disk Method	
7.3 Volume: The Shell Method	3
8. Integration Techniques, L'Hopital's Rule, and Improper Integrals	
8.1 Basic Integration Rules	
8.2 Integration by Parts	1
9. Review for AP Exam	4
Total Weeks	33

Resources

Calculus Textbook
Multiple Choice Questions/Answers Prep book
Released AP Exams
Teacher Produced Materials

Assessments

1. Practice quiz from resource
2. Oral questions for understanding
3. Board work
4. Teacher written test and standard tests on chapters.
4. Released AP Exams