

Directions: Your objective is to create a comprehensive AP Calculus AB Exam study guide that you can carry with you to AP Calculus BC and beyond! The parameters are as follows:

1. The review sheet must fit on one sheet of letter sized (8.5" by 11") paper. It is strongly recommended that you use the front [Units 2-5] & the back [Units 6-8].
2. The review sheet must be extremely neat and well organized.
3. The review sheet must typed or neatly handwritten.
4. The review sheet **must contain at least all** of the following topics below.

Unit 2 - Limits & Continuity

- Limit Definition of Continuity
- Limit Definition of the Derivative
- Alternative Limit Definition of the Derivative
- Squeeze Theorem
- Intermediate Value Theorem
- List Dangerous situations that are NOT differentiable.

Unit 3 – Rules/Techniques of Differentiation

- Definition of Power Rule
- Definition of Product Rule
- Definition of Quotient Rule
- Definition of Chain Rule
- List of Trigonometric Derivatives
- List of Inverse Trigonometric Derivatives
- List of Logarithmic and Exponential Derivatives – Natural Base and Other Bases
- Derivative of $f^{-1}(x)$ formula
- Differentiability vs. Continuity

Unit 4 – Concepts involving the Derivative

- First Derivative Test to determine increasing & decreasing intervals, local extrema
- Second Derivative Test to determine concavity, points of inflection
- Summary of Connections from the Graph of a Derivative
- Mean Value Theorem
- Extreme Value Theorem (Absolute Extrema)
- Relationship between Position, Velocity and Acceleration
- Total Distance vs. Displacement
- Speeding Up vs. Slowing Down

Unit 5 - Applications of Derivatives

- L'Hopitals Rule – Definition and List of Indeterminate Forms
- Summary of Linear Approximation Method
- Related Rates Summary
- Optimization Summary

Unit 6 – Concepts involving Integration

- RRAM, LRAM, MRAM, TRAP
- Definition of Power Rule for Integration
- Fundamental Theorem of Calculus
- Riemann Sum Notation

Unit 7 – Rules/Techniques of Integration

- Average Value for Integrals
- Mean Value Theorem for Integrals
- List of Trigonometric Integrals
- List of Inverse Trigonometric Integrals
- List of Logarithmic and Exponential Integrals – Natural Base and Other Bases
- List of the Properties of Integrals

Unit 8 - Applications of Integration

- Total Change Theorem
- Disk Method Formula with respect to both x and y axis
- Washer Method Formula with respect to both x and y axis
- Shell Method Formula with respect to both x and y axis
- Volume for Solid with Known Cross Section (Slabs)