

AP Calculus Topics

A Prerequisites

- A Solving Polynomial Inequalities Algebraically
- B Solving Absolute Value Equations and Inequalities Algebraically
- C Trigonometry
- D Logarithmic and Exponential Functions

B Functions and Graphs

- A Domain and Range (including intercepts)
- B Graphs of Functions: $y = f(-x)$, $y = -f(x)$, $y = f(|x|)$, $y = |f(x)|$, $|y| = f(x)$
- C Compositions of Functions
- D Finding Inverses
- E Graphic Calculator Use for Roots
- F Asymptotes
- G Symmetry, Even and Odd Functions

C Limits and Continuity

- A Estimation from Graphs
- B Find Limits as $x \rightarrow a$
- C Special Limits ($\lim_{x \rightarrow 0} \frac{\sin x}{x}$, $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$, $\lim_{n \rightarrow \infty} (1 + \frac{1}{n})^n$)
- D One Sided Limits
- E Limits at Positive or Negative Infinity
- F Continuity: Removeable, Infinite, and Jump (and Relation to Limits)
- G Intermediate Value Theorem

D Derivatives I

- A Recognizing Limits as Derivatives
- B Derivatives from a Table of Values
- C Estimating Derivatives from Tabular Values of f and f'
- D Graphically Going From $f(x)$ to $f'(x)$ and $f'(x)$ to $f''(x)$
- E Increasing and Decreasing Functions
- F Rolle's Theorem
- G Mean Value Theorem (includes integrals)
- H Local Linear Approximations, Differentials and Approximation Formulas
- I Average and Instantaneous Rates of Change
- J Relationship Between Concavity and the Sign of f'' (including inflection points)
- K Max/Min from f' with Graphic Calculator
- L Newton's Method
- M Indeterminate Forms and L'Hopital's Rule
- N Exponential and Logarithmic

E Derivatives II

- A Analysis of Curves and Curve Sketching (max, min, etc)
- B Calculating Derivatives (sum/difference/product/quotient)
- C Tangents
- D Higher Order Derivatives
- E Derivatives of Inverse Functions
- F Chain Rule
- G Implicit Differentiation
- H Optimization Problems
- I Velocity and Acceleration (Including Graphical Representation)
- J Related Rates Problems

F Integration I

- A Riemann Sums Using Left, Right, and Midpoint Evaluation Points
- B Trapezoidal Approximations
- C Definite Integral as a Limit of Riemann Sums
- D Calculating Antiderivatives Using Power Rule and Additivity
- E Antiderivatives using u , du substitutions
- F Antiderivatives: Trigonometric and Inverse Trigonometric
- G Definite Integrals I: Setting Up and Using Definite Integrals
- H Definite Integrals II: Fundamental Theorem of Calculus Using a Calculator
- I Fundamental Theorem of Calculus: 2nd version $\left(\frac{d}{dx} \int_a^b f(t) dt = f(x)\right)$
- J Relationship Between Max/Min and Graphical Representation of f , f' and f''
- K Solving Separable Differential Equations
- L Slope Fields
- M Integration by Parts
- N Partial Fractions
- O Improper Integrals

G Integration II

- A Average Value
- B Area Between Curves
- C Initial Value Problems Including Motion Along a Line
- D Volume of Solids With Known Cross Sections
- E Volume of Solids of Revolution
- F Growth/Decay Problems (applying $y' = ky$)

H Free Response Questions

- A Free Response Questions

I Optional Topics

- A Series
- B Arclength
- C Derivatives of Parametric Equations