

API_Calculus

1. Limits and Continuity

- 1.1 Intuitive Approach
- 1.2 Limit (Numerical Approach)
- 1.3 Limit (Graphical Approach)
- 1.4 Limit (Algebraic Approach)
- 1.5 Limits as x approaches Infinity
- 1.6 Formal definition of Limit
- 1.7 Continuous Functions
- 1.8 Theorems on Continuous Functions

2. The Derivative

- 2.1 Introduction
- 2.2 Derivative of a Function by definition
- 2.3 Rules for Derivatives
- 2.4 Implicit Differentiation
- 2.5 Strategy for Differentiation
- 2.6 Derivative of Exponential Function
- 2.7 Derivatives of Logarithmic Function
- 2.8 Inverse Trigonometric Functions
- 2.9 Related Rates
- 2.10 Linear Approximation and Differentials

3. Applications of the Derivatives

- 3.1 Introduction
- 3.2 Mean value and Theorem
- 3.3 Increasing and Decreasing Functions
- 3.4 Critical Points
- 3.5 Local and Absolute Extrema
- 3.6 Concavity
- 3.7 Optimization
- 3.8 Antiderivative

4. Integration

- 4.1 Approximating Area under a curve and above the x-axis
- 4.2 Definite Integral
- 4.3 Theorems of Definite Integral
- 4.4 The Fundamental Theorem of Calculus
- 4.5 Indefinite Integral (Antiderivatives)
- 4.6 More Rules for Indefinite Integrals
- 4.7 Strategy for Integration
- 4.8 Area Between Curves

5. Integrals and Transcendental Functions

- 5.1 Basic Results
- 5.2 Derivative and Antiderivative of Exponential Function
- 5.3 Re-visit the Power Rule and Trig. Rules
- 5.4 Derivative and Antiderivative of Inverse Trig. Functions
- 5.5 Derivative and Antiderivative of Hyperbolic Functions
- 5.6 L'Hopital's Rule
- 5.7 Applications: Relative Rates of Growth