MA114
Course Outline

I. Exponential Functions
   A. Review
      1. Definition
      2. Properties
   B. Derivatives
   C. Application Problems
      1. Exponential Growth & Decay

II. Logarithmic Functions
   A. Review
      1. Definition
      2. Properties
   B. Derivatives
   C. Logarithmic Differentiation (recommended)

III. Inverse Trigonometric Functions
   A. Definitions
   B. Derivatives
   C. Corresponding Integrals

IV. Hyperbolic Functions
   A. Definitions
   B. Derivatives
   C. Corresponding Integrals

V. Limits
   A. Indeterminate Forms
      1. Recognize $\frac{0}{0},\ \frac{\infty}{\infty},\ \infty-\infty,\ 0\cdot\infty,\ 0^0,\ \infty^0,\ 1^\infty$
   B. Evaluate
      1. L'Hospital's Rule

VI. Integration Techniques/Strategies
   A. Integration by Parts
   B. Trigonometric Integrals
   C. Trigonometric Substitution
   D. Partial Fractions
      1. Long Division
   E. Rationalizing Substitutions (recommended)
   F. Tables
   G. Approximate Integration
      1. Midpoint Rule
      2. Simpson's Rule
      3. Trapezoidal Rule

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VII. Improper Integrals
- A. Infinite Intervals
- B. Discontinuous Integrands

VIII. Sequences
- A. Definition
    1. Convergent
    2. Divergent

IX. Series
- A. Defintion
    1. Convergent
    2. Divergent
    3. Absolute Convergence
    4. Conditional Convergence
- B. Geometric Series
- C. P-Series
- D. Alternating Series
- E. Tests
    1. Test for Divergence
    2. Integral Test
    3. Comparision Tests
        a. Comparision Test
        b. Limit Comparision Test
    4. Alternating Series Test
    5. Ratio Test
    6. Root Test
- F. Power Series
    1. Radius of Convergence
    2. Interval of Convergence
    3. Properties
        a. Derivative
        b. Integral
    4. Expressing Functions as Power Series
        a. Taylor Series
        b. Maclaurin Series