

Review for Exam II

Sections 7.4-8.7

Chapter 7

- A. Properties of the Riemann Integral
 - 1. Additive over Intervals
 - 2. Linearity on Integrands
 - 3. Modulus Estimate
- B. Definition of Derivative
- C. Properties of Differentiation
 - 1. Linearity
 - 2. Product & Quotient Rule
 - 3. Lemma (Page 195)
 - 4. Chain Rule
 - 5. Derivative of Inverse Function
- D. Rolle's Theorem, Mean Value Theorems
 - 1. Application of Mean Value Theorems (e.g., Theorem 7.7B)
- E. Fundamental Theorems of Calculus
- F. Improper Integrals
 - 1. Unbounded Intervals of Integration
 - a. Definition of Convergence
 - i. p-integrals
 - b. Linearity
 - c. Absolute Convergence
 - d. Comparison Test for Absolute Convergence
 - e. Absolute Convergence \Rightarrow Convergence
 - f. Integral Test
 - 2. Unbounded Integrands
 - a. Definition of Convergence
 - i. p-integrals
 - b. Linearity
 - c. Absolute Convergence
 - d. Comparison Test for Absolute Convergence
 - 3. Cauchy Principal Convergence
- G. Theorems whose proofs you should know
 - 1. Lemma 7.4D
 - 2. Corollary 7.4F
 - 3. Theorem 7.5C
 - 4. Theorem 7.6C
 - 5. Theorem 7.7B
 - 6. Theorem 7.8A
 - 7. Theorem 7.8C
- H. Representative Problems
 - 1. 7.4: 4, 5, 7, 8

- 2. 7.5: **1, 5**
- 3. 7.6: **2**
- 4. 7.7: **1, 4**
- 5. 7.8: **2, 4**
- 6. 7.9: **1, 6**
- 7. 7.10: **1, 3, 4**

Chapter 8

- A. Hyberbolic Functions
 - 1. Definition of U
 - 2. Properties of U
 - 3. Definition of S via Inverse of U
 - 4. Definition of C
 - 5. Properties of S and C
- B. Exponential Function
 - 1. Definition of E
 - 2. Properties of E
- C. Logarithmic Function
 - 1. Definition of L via Inverse of E
 - 2. Properties
 - 3. Definition of a^x and x^a
- D. Trigonometric Functions
 - 1. Definition of u
 - 2. Properties of u
 - 3. Definition of s via Inverse of u
 - 4. Extension of s from $[-\pi/2, \pi/2]$ to $(-\infty, \infty)$
 - 5. Definition of c
 - 6. Properties of s and c
- E. Taylor's Theorems with Remainder
 - 1. Integral Remainder Form
 - 2. Lagrange Remainder Form
 - 3. Cauchy Remainder Form
- F. L'Hospital's Rule
 - 1. Indeterminate Forms $0/0$
 - 2. Indeterminate Forms ∞/∞
- G. Theorems whose proofs you should know
 - 1. 8.7A
- H. Representative Problems
 - 1. 8.1: **1**
 - 2. 8.2: **2, 3, 4**
 - 3. 8.3: **2, 4**
 - 4. 8.4: **2, 5, 6**
 - 5. 8.5: **1, 2**
 - 6. 8.7: **1, 2, 3, 4**