

MTH 112 : Spring 2021

Outline for Exam 4

05/11/2021

I. Infinite Series: Tests for Convergence

A. Section 9.1: Sequences

- i. Goals: Understand what a sequence is, find a formula for the n -th term of a sequence, and know how to determine the long-term behavior of a sequence (i.e. determine whether it has a limit).
- ii. Recommended Problems: pp. 495, 496: # 1 – 98

B. Section 9.2: Infinite Series

- i. Goals: Understand what an infinite series is. Know how to find the limits of telescoping and geometric series. Be able to re-index a series as needed.
- ii. Recommended Problems: pp. 505, 506: # 1 – 68

C. Section 9.3: The Integral Test

- i. Goals: Use the integral test to determine convergence for a series of positive, decreasing terms. Use the integral test to find bounds for such series when they converge.
- ii. Recommended Problems: pp. 511: # 1 – 40

D. Section 9.4: Comparison Tests

- i. Goal: Understand how to use the Direct and Limit Comparison Tests to determine whether a series converges.
- ii. Recommended Problems: p.516: # 1 – 36

E. Section 9.5: The Ratio and Root Tests

- i. Goal: Understand how to use the Ratio and Root Tests to determine whether a series converges.
- ii. Recommended Problems: p.521: # 1 – 36

F. Section 9.6: Alternating Series, Absolute vs. Conditional Convergence

- i. Goals: Understand the difference between absolute and conditional convergence. Understand how to use the Alternating Series test to determine whether a series converges.
- ii. Recommended Problems: p.527: # 1 – 36

II. Taylor Series

A. Section 9.7: Power Series

- i. Goals: Know what a power series is and how to test it for convergence. Understand the radius of convergence of a power series and how to find it. Know that we can take term-by-term derivatives and integrals over their radii of convergence.
- ii. Recommended Problems: pp.536, 537: # 1 – 30, 41 – 48

B. Section 9.8: Taylor and Maclaurin Series

- i. Goals: Know the definitions of Taylor and Maclaurin Series as well as Taylor Polynomials.
- ii. Recommended Problems: p.542: # 1 – 30