

Last update: Fri Nov 17 05:42:57 MST 2006 /m175.fa06/handouts175/t3_175_B17/review_suggestions_3.tex

1 This list is now in final form.

2 Test #3 is

Friday
11/17/06.

3 There will be a with-calculator part of this exam. Bring at least a TI-30.

4 The test will cover the material of Assignments #23 – #30, roughly, that is, sections 11.1 - 11.8.

Note that chapter 10 and section 11.9 have been put off for the final.

5 Topics:

- (1) L'Hôpital's Rule
- (2) Evaluating improper integrals
- (3) Determining whether an improper integral converges.
- (4) The formal $\epsilon - N$ definition of convergence of a sequence.
- (5) Rising-chain proofs of simple sequence limits.
- (6) What's a sequence? What's a series? In every-day speech, they are the same thing. But in MATH 175, not so.
- (7) The Gang of Four Famous Sequences
- (8) The sum of an arbitrary infinite series.
- (9) The *Test for Divergence*.
- (10) Sum of a Geometric Series.
- (11) Telescoping-series detection.
- (12) The integral test for infinite series.
 - (i) Conditions to which this test applies
 - (ii) L'Hôpital's Rule
 - (iii) Evaluating improper integrals
 - (iv) Determining whether an improper integral converges.

- (v) The famous p -series facts
- (vi) When a series is tagged as convergent via the integral test, we can compute an outer estimate for the error in using a partial sum to approximate the true sum.

(13) Comparison tests for convergence and divergence of infinite series

- (i) The kinds of series to which the comparison test applies.
- (ii) A library of series of known behavior.
- (iii) The Limit Form of Comparison Test with

$$\lim_{n \rightarrow \infty} \frac{u_n}{c_n} \in [0, \infty) \quad \text{and} \quad \lim_{n \rightarrow \infty} \frac{u_n}{d_n} \in (0, \infty]$$

(14) Alternating series

- (i) The kinds of series to which this test applies.
- (ii) The *easy* outer estimate for the error in using a partial sum to approximate the true sum.

(15) Absolute convergence

(16) The Venn diagram showing the logical relationships between the infinite-series ideas of convergence, divergence, having the n^{th} term go to zero, absolute convergence, and conditional convergence.

(17) The *Root Test* for absolute convergence.

(18) The *Ratio Test* for absolute convergence.

- (i) Factorial algebra
- (ii) Factorial-like algebra

(19) What's a Power Series?

(20) Interval of Convergence (IOC) and its interior. And computation thereof.

(21) Radius of Convergence (ROC)

(22) Functions related to the geometric series: expansion of them into power series.

(23) Derivatives and Integrals of power series.

6 It's probably profitable to prowl through the recent quizzes.