

## Math 1XX3 Midterm 2 Info Sheet

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The purpose of this handout is to help you study by listing the concepts, definitions, and results you will need to know for the midterm.

**Midterm Information.** The midterm will be on Thursday March 17, 2016 at 8:30AM. The midterm will take place in

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and will be 50 minutes long. You will *not* be allowed to bring in any notes or use the text book, You will be allowed to use the standard McMaster Calculator (Casio FX-991). You must bring your **Student Card**.

**Material Covered.** All the material discussed in class since Midterm 1 may appear on Midterm 2. We covered all of Chapter 11. Below, I have given a breakdown of what you will need to know from each section. Note that when you are learning terms, it is good to think of an example of that satisfies that term, and one that does not satisfy that term.

**Section 11.1.** Know what a sequence is; know what it means for a sequence to converge or diverge or for the sequence to have a limit (see Definitions 1 and 2 on page 696). Know what it means for a sequence to be increasing, decreasing, monotonic, or bounded.

**Section 11.2.** Know what a series is, and what it means for a series to converge or diverge. Know what a geometric series (and when it converges/diverges). Know what the harmonic series is. Also know the Test for Divergence.

**Section 11.3.** Know how to apply the integral test (in particular, you need to check that the hypotheses are satisfied). Know when a  $p$ -series converges or diverges. Know how to estimate a remainder using the integral test.

**Section 11.4.** Know how to use the comparison test and the limit comparison test.

**Section 11.5.** Know what it means for a series to be alternating. Know how to apply the alternating series test. Also, know how to estimate remainders for alternating series.

**Section 11.6.** Know what it means for series to be either absolutely convergent or conditionally convergent, and their properties. Know how to use the ratio and root tests for testing for convergence. You do not need to know about the material about rearrangements. You will *not* be asked about the proof I did in class that  $\sum_{n=1}^{\infty} \frac{1}{n} = \ln 2$ .

**Section 11.7.** This section is useful in that it gives a number of suggestions on how to determine what test to apply to a series.

**Section 11.8.** Know what a power series is. Know what we mean when we say a power series is centered at  $a$ . Be able to find the radius of convergence of a power series and its interval of convergence.

**Section 11.9.** Know how to represent a function as a power series, and how to use properties like integration and differentiation to find new power series. Be able to do problems like those discussed in class.

**Section 11.10.** Know how to construct a Taylor series or Maclaurin series for a function. Know what is meant by the  $n$ -th degree Taylor polynomial. Know Taylor's inequality. You do not need to memorize the Table on page 768. I will provide you with any needed Maclaurin series.

**Section 11.11.** You will not be tested directly on this material.

If you have questions, please feel free to email me. I hope to arrange an additional midterm review using the Math Help Centre – I'll send out any information via email. Good luck!