Math 1230 Final Exam Info Sheet

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

Final Exam Information. Here's the time and location:

(1) **Time:** 1-4PM on Thursday, April 12, 2007
(2) **Place:** UC 2011 (Upper lecture theatre)

Please note that:

- You must **Bring your STUDENT ID**.
- You may not use a calculator. However, you will be allowed to bring one regular 8.5 x 11 sheet of paper with notes on only **one** side. What you put on this sheet is up to you.

Material Covered. The exam will cover all the material discussed in class about Sections 5.4-5.9, 6.1-6.2, 7.1-7.6, 8.1-8.8, 9.1-9.10, and 10.2-10.5 of the textbook. Please see the review sheets for Midterms I and II for what you need to know from Chapters 5-8 (extra copies available on the web).

I have given a breakdown of what you will need to know from Chapters 9 and 10.

Section 9.1 Know what a sequence is, and what it means for a sequence to converge and diverge. Know what we mean by the limit of a sequence. Know the Squeeze Theorem, and what it means for a sequence to be monotonic, bounded below or bounded above, and how this is related to convergence (Theorem 9.5)

Section 9.2 Know what a infinite series is, and what it means for a series to converge and diverge. Know what we mean by a telescoping series and geometric series. Theorem 9.6 is important to know. Also know the nth Term test for divergence (Theorem 9.9).

Section 9.3 Know the integral test and how to use it to determine if a series converges. Also know what a p-series is, and when it converges and diverges (Theorem 9.11).

Section 9.4 Know how to use the comparison test to determine if a series converges or diverges. As well, know how to use the limit comparison test.

Section 9.5 Know the alternating series test (Theorem 9.14), and know what it we mean by absolutely convergent and conditionally convergent. You don't need to know the material on the alternating series remainder (pg. 633) and rearrangement of a series (pg. 635).

Section 9.6 Know the ratio test (Theorem 9.17) and the root test (Theorem 9.18). The table on page 644 is very useful!

Section 9.7 Know how to find Taylor and Maclaurin polynomial approximations of a function (see Definition on page 650). Be able to do problems like those in class (and Examples 4-6). You do not need to know the material on the remainder of a Taylor Polynomial).

Section 9.8 Know what a power series is, and what it means for a power series to be centered at c. Be able to find the radius of convergence and interval of convergence for a power series. I will not test you on the material on differentiation and integration of power series.

Section 9.9 Know how to represent a function with a geometric power series. Know how to use operations with power series to construct new power series from old.

Section 9.10 Be able to find the Taylor and Maclaurin Series for a given function (Definition on page 677) and be able to find its interval of convergence. Also know the material on binomial series. The table on page 682 will also be useful – know how to use the elements in this chart to find power series for more complicated functions.

Section 10.2 Know what we mean by a parametric equation, parameter, and plane curve. Be able to sketch some simple parametric equations. Know how to eliminate a parameter. Skip the material on the Tautochrone and Brachistochrone Problems.

Section 10.3 Know the parametric from of the derivative (Theorem 10.7). Also be able to find the arc length in parametric form (Theorem 10.8). You can skip the material on the area of a surface of revolution.

Section 10.4 Understand polar coordinates, and how to move from the regular coordinate system to polar coordinates and back. Be able to sketch a graph in polar coordinates, and find the slope of a tangent line to a polar graph. Be able to find horizontal and vertical tangent lines.

Section 10.5 Know Theorem 10.13 and how to find area in polar coordinates. Be able to find the points of intersection of a polar graph. You should also know the formulas for the arc length of a polar curve (Theorem 10.14). You can skip Example 3 and how to find the area of a surface of revolution.

The Weighting of the Exam. When I calculate the final grade, I will weigh the exam in two different ways, and take the higher of the two grades.

> *First Way.* I will use the weighting as described in the course handout, that is, the exam will count for 35% of your final mark.
>
> *Second Way.* I will not use the lower of your two midterm marks, but instead, let your exam count for 60%.

For example, suppose you got 7/15 on your homework, and your first test (after re-weighting) was 15/25 and the second test was 12.5/25, Suppose you received 60% on the final. For the first way, your exam would be re-weighted to be 21/35 and you would have a grade of

$$\frac{7}{15} + \frac{15}{25} + \frac{12.5}{25} + \frac{21}{35} = \frac{55.5}{100}.$$

For the second way, your exam would be re-weighted to 36/60, which would then give you a grade of

$$\frac{7}{15} + \frac{15}{25} + \frac{36}{60} = \frac{58}{100}.$$

Your final grade would then be the highest of the two, i.e., 58%.

Note. I will be out of town April 4-8, 2007. Except for these days, I should be available in my office from 10AM-4PM to answer questions (except the afternoon of April 11 since I have another exam). Please feel free to drop by to ask me a question, or send me a question via email (`avantuyl@sleet.lakeheadu.ca`) or by phone (343-8228).