

Mathematics 162: Final Exam Information

Time and Location: 6:30-9:30 pm on Monday, May 14

- Section A (Professor Bolt), North Hall 276
- Sections B and C (Professor Scofield), North Hall 078
- Section D (Professor Bolt), North Hall 295

Exam Syllabus: The final exam will cover the following sections:

Chapter 7: Sections 1–4, 6, 7

Chapter 8: 2 (geometric and telescoping series, n^{th} term test),
3 (recognition of convergent/divergent p -series (see Example 3)),
5 (ratio test),
6 (absolute convergence test),
7, 8

Chapter 9: 1, 3 (areas)

Chapter 10: 1–6

Chapter 11: 1–2

Chapter 12: 1–7

Chapter 13: 1–5, 6 (first moments, centers of mass), 7

The exam will have two parts. The first part of the exam is to be worked without the aid of a calculator. Calculators may be used on the second part of the exam. Both parts of the exam will be handed out at the beginning of the exam period. However, you will not be allowed to use your calculator until you turn in the first part of the exam. Having a look at part two before you turn in part one should make budgeting your time easier.

In order to give you a sense for the flavor and/or difficulty of the types of problems we might give on the final, we recommend that you look at the problems listed below. You are hereby *strongly warned* against studying only the problems from this list to the exclusion of other material.

7.1: 3,7,23 – 7.2: 5,21 – 7.3: 15,17,21 – 7.4: 11,21,31 – 7.6: 9(Iab,IIab),23 – 7.7: 11,17,29
8.3: 1,2,3,11,23,41,45 – 8.5: 3,5,21 – 8.6: 1,11,13,27,45,46 – 8.7: 1,5,6,13 – 8.8: 1,5,9,13,25 – 8.9: 7,15
9.3: 9
10.2: 3 – 10.3: 5,9 – 10.4: 1,15 – 10.5: 3,25 – 10.6: 1,5,7
11.1: 12,19 – 11.2: 2
12.1: 1,21,35 – 12.2: 3,39 – 12.3: 11,47 – 12.4: 7,17,27 – 12.5: 15,21 – 12.6: 5 – 12.7: 13,34
13.2: 25,35,53 – 13.4: 18,27 – 13.5: 25,41 – 13.6: 13 – 13.7: 43,53

You are responsible for knowing the concepts, techniques and topics from all sections listed in the **Exam Syllabus** above. We would like to emphasize the following particular expectations:

- You are expected to be able to evaluate integrals, find partial derivatives, and find exact values for series (when possible), *without the assistance of a calculator*.
- You are expected to show calculations that support your answers. For example, answers to integral problems that do not show the supporting steps, or numeric results simply copied from a calculator will receive no credit, whether or not the answer is correct.

You are expected to know the formulas used in this course. However, to assist you in preparing a list of things to have memorized for the exam, we offer the following guidelines. Among the things you will want to know are:

- these basic trigonometric facts:
 1. $\sin \theta$, $\cos \theta$, etc. when θ is a common angle (multiples of $\pi/6$ and $\pi/4$)
 2. $\sin^2 \theta + \cos^2 \theta = 1$ and $\tan^2 \theta + 1 = \sec^2 \theta$
 3. $\sin^2 \theta = \frac{1}{2}(1 - \cos(2\theta))$ and $\cos^2 \theta = \frac{1}{2}(1 + \cos(2\theta))$
 4. $\sin(2\theta) = 2 \sin \theta \cos \theta$ and $\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$
- antiderivative formulas for various functions, including

x^n (Note: The case $n = -1$ is special).	$\sin x$
$\frac{1}{1+x^2}$,	$\cos x$
$\frac{1}{\sqrt{1-x^2}}$,	$\sec^2 x$
$\tan x$	$\csc^2 x$
$\cot x$	$\sec x \tan x$
	$\csc x \cot x$

- the Maclaurin series for $\sin x$, $\cos x$, e^x , and $\frac{1}{1-x}$ and the radius of convergence for each.