Fall 2003

Guidelines and Suggestions

For Instructors of Math 32 and Math 41

Contents

Revised 20 August 2003

GENERAL INFORMATION

1. For the day–to–day operations during the semester, the SFI will often communicate with teachers via **email**. Thus, you should check your email daily for notices of meetings, changes in plans, corrections, announcements, *et cetera*. Dr. Margaret Hodel be the course supervisor for both Math 32 and Math 41 this fall.

2. There is a Departmental syllabus for each of Math 32 and 41. It is important that you cover all of the material on the syllabus so that your students will be prepared for the final examination.

3. Calculators will not be allowed on the final exam in Math 32 and 41; teachers may determine the calculator policy for their own tests.

4. Homework graders will be hired for you by the staff in the Math Department office. You will receive a separate memo detailing the guidelines under which graders must work, but note that it is one of your responsibilities to help us ensure that graders report a reasonable number of hours that are within the guidelines. Your grader should contact you early in the semester to discuss the grading and handling of papers. If your grader does not return homework papers promptly and ignores your requests to do so, let the office staff know. You may want to have homework count 3% to 5% of the student's grade.

5. The Department will operate three Help Rooms, one for students in Math 25L & 31L & 32L, one for students in Math 32 & 41, and one for students in Math 103. All three are located on East Campus for the convenience of the first-year students who live there. The Math 25L/31L/32L helproom will operate for about 8 hours each day and will require the participation of all Math 25L/31L/32L teachers. The Math 32/41 and 103 helprooms, on the other hand, will operate in certain evenings only and will be staffed by tutors hired by the Math Department. Teachers in Math 32 & 41 &103 will not be asked to participate in the Help Room, and instead should hold normal office hours.

6. The web site *http://www.math.duke.edu/first_year* contains much information that can be helpful to your students. It includes links to information on placement, tutors, the helproom schedule, and the course home page. Please give this address to your students on the first day of class. If you set up a web page for your individual section, send the URL to Lewis Blake so he can include it on the course home page.

7. Anytime a student has been unexpectedly absent from class for a long time you should inform the SFI and the Dean. The dean for first-year students in Trinity College is Dean Norman Keul (nkeul@pmac.duke.edu) in the Pre-Major Center (telephone 684-6217). The assistant dean for first-year engineering students is Dean Connie Simmons (csimmons@acpub.duke.edu) in the Teer Building (telephone 660-5387). Keeping the

deans informed is potentially a matter of the physical and psychological welfare of the student.

8. If you want to hold extra—necessarily voluntary—problem sessions for your classes see a member of the staff in room 121 to reserve a room. Because of the danger of inadvertently compromising the block final exam, **you should not hold any review sessions near the end of the semester nor should you distribute any exam review sheets**. You may, instead, hold problem–working sessions wherein the *students choose* the problems to be worked. Also, **the administration requires that no scheduled group meetings with students, even voluntary ones, be held after the end of classes.** You may, of course, continue to hold office hours as long as you wish.

9. There are "Instructor's Solution Manuals" available to you and your grader. Textbooks and solutions manuals are available in the Department office, and extra syllabi are available in room 118 and from the course web page.

10. Please make notes of any changes that you feel should be made to the next syllabus, and give your notes to Margaret Hodel.

11. Make a reciprocal agreement with another instructor to take your class in case you become ill. Inform Lewis Blake anytime that you will not teach your own class, and let him know who your substitute will be.

TESTS, FINAL EXAMINATIONS, FINAL GRADES

1. The *University Honor Code* requires that students, by their signatures, acknowledge personal acceptance of the Code and that they have abided by its tenets. Thus, in some explicit manner, students must sign all written work and indicate their adherence to the principles of the Code.
   (a) All term papers and research reports should acknowledge the Code.
   (b) All tests should include explicit student acknowledgment of the Code and that they have abided by it. An example statement is "I have neither given nor received aid in completion of this examination."

2. Math 32 and Math 41 will have the same final exam, which will be a Departmental exam. Margaret Hodel will supervise the writing of the exam and will make final decisions with regard to the content of the exam. The exam will be block graded. After the exam is graded, the SFI will make a tally of the results of the exam and in consultation with Margaret will determine a grading scale for the exam.

3. The number of hour tests, whether to give quizzes, homework policy, and the relative weight of the final exam are determined by each individual instructor and should be announced at the beginning of the term. (A typical distribution is $\frac{1}{3}$ for the final examination and $\frac{2}{3}$ for other work.) Before you make the details of these decisions, however, you should consider carefully the implications of paragraphs 4 an 5 below.

4. **The semester grades that you turn in for your class must correlate closely with your class's grade distribution on the final exam.** This does not mean, for example, that the number of B's you submit must be *exactly* the same as the number of B's that your students make on the final, but the number should be very close.

5. The SFI will also designate a "mandatory F" score, which will be based upon students' scores on the final. **Any student who scores below the mandatory F on the final exam must receive an "F" for the course**, unless, upon appeal *from the teacher* on behalf of the student, an exception is granted by the SFI or the DUS. Sometime before the final exam, you should explain to your students the policy concerning the mandatory "F."

6. When you return graded tests to students, it is beneficial to the students for you to provide them with a complete set of solutions to the test. A convenient way to do this is to leave room on the master copy for solutions, and after the test is given, you can fill in solutions and then make copies of the key. This process will save class time and provide students with something to study at exam time.

7. If this is your first time teaching at Duke, have an experienced instructor check over your tests before you give them, and have your grading scale checked after you have graded the tests.

8. Although the University does not officially recognize religious holidays, you should try to avoid scheduling tests on such days.

ADMINISTRATIVE INFORMATION FOR STUDENTS

1. The matters listed below should be taken care of on the first day of classes. Because doing so will take most of the class time, you will have to leave much of the first lesson for the students to read for themselves in the textbook.

   a. You should give students your name, office location, and homework policy. Tell them about the calculus help rooms and about your schedule for office hours.

   b. You should identify the textbook that we are using, and tell the students whether you expect them to bring their books to class each day.

   c. Let students know the calculator policy. (See paragraph 3 on page 2)

   d. You should tell students about the final examination, your policy on hour tests and other quizzes, and how you will determine their final grades. We suggest that you give make-ups for missed tests only if the student has a written excuse from the student's dean.

   e. You should give the students copies of the syllabus. Be sure they can read the syllabus correctly and that they know your policy regarding homework.

   f. Give students the web address

      http://www.math.duke.edu/first_year/

      and tell them that at this site they can find placement information, the the helproom schedule, and a link to course home pages (which include syllabi).

2. An efficient way to disseminate most of the information above is to put it on an "information sheet" and pass copies out on the first day of classes. Two examples are attached to this pamphlet.

DROPPING AND DROPPING BACK

During the first two weeks of classes, students can change (drop/add) their course or section through Duke's web registration system (ACES). At the Web site, http://www.math.duke.edu/first_year, students and faculty can find information about math placement and introductory math courses. It would be helpful if you point this out to any students who are asking questions about placement.

Drop/Add ends after the first two weeks of classes, and **after that time students are not allowed to <u>drop</u> a course without special approval from their dean**. If, after the drop/add period is over, it does appear to you that a student has been seriously misplaced, then you should discuss the matter with the SFI before you make any specific placement suggestions to the student. In the past the Registrar's Office has in special cases allowed us to transfer a student back to a lower level, through the end of the fifth week of classes. However, because of the nature of Math 31L, it is difficult to assimilate students into that course after the second week, so it is important to try to identify misplaced students as soon as possible. In no case will a change in math courses be made after the end of the fifth week of classes.

CLASS FORMAT AND LECTURES

1. In a typical class you should spend 10–to–15 minutes answering questions on the homework assignment due that day. Look over the homework problems assigned before going to class so that you can decide which problems are worth spending class time on. (You probably won't have time to work all of the problems which the students would like to see.) Before working a problem, write the page number and the number of the problem on the board. It may even be worth while to copy the problem on the board. Don't be ashamed to peek at the solution manual before class begins.

2. Spend the remaining 35–to–40 minutes of class time discussing new material. You should not follow the text verbatim. A good strategy is to look at the exercises assigned for homework and then write a lecture which emphasizes examples closely related to these exercises. (But do NOT use the same examples in the classroom that the textbook uses.) This technique should help students to get started on their written assignment.

3. The emphasis of your lectures in Math 32 and Math 41 should be on applications and understanding of the calculus rather than on formal proofs. Math 32/41 is not an introductory real variables course, nor is it a course in symbol manipulation. We expect the students to learn to use and understand precise mathematical language in the context of calculus.

4. Learn the names of your students as soon as possible. One way to do this quickly is to return homework papers daily. You may be surprised the extent to which this simple courtesy can generate a positive feeling among your students.

5. As much as possible, maintain eye contact with the students. In particular, you should spend more time looking at students than looking at the chalk board.

6. The booklet Chalking It Up by Bruce Reznick has some good advice on teaching. Copies are available in the resource room.

7. Organize your writing on the blackboards, and print neatly. Label things to make it easy for students to take notes and to follow what you are doing in class. Such blackboard techniques are especially important for weaker students, who will work at deciphering their notes after class is over. Listed below are some samples of examples, definitions, and theorems, as they might appear on a well-organized blackboard:

Example: At the end of t seconds, the height of a stone thrown straight up from Duke Chapel is approximately $s(t) = -16t^2 + 64t + 210$ feet above the ground. How high above the ground does the stone rise?

Example: Find all values of x for which $f(x) = \frac{x}{(12+x)}$ is increasing.

Example: Find the area A of the region bounded by the line $x = y + 2$ and

the parabola $x = y^2$.

Definition: Let A and B be sets of real numbers. A function f from A to B, denoted $f: A \longrightarrow B$, is a rule which assigns to each number x in A a unique number y in B . We write $y = f(x)$. The number y is called the value of f at x, the set A is called the domain of f , and the set of all values is called the range of f .

Example Find the implied domain of $f(x) = \sqrt{\frac{x+2}{x-1}}$.

Mean Value Theorem

Let f be continuous on [a,b] and differentiable on (a,b) . Then there is a number c , $a < c < b$, such that

$$f'(c) = \frac{f(b)-f(a)}{b-a} .$$

Example Verify the MVT for $f(x) = \sqrt{1-x^2}$, $-1 < x < 1$.