I fell asleep that night with visions of sugar plums dancing in my head. I woke up in the morning convinced that I had seen the end of Western civilization as we know it. If a student can click on "derivative" any time he/she wishes—to remind him/her what the concept means—then I bet that he/she will *never* actually learn what a derivative is. He/she will never internalize it, and therefore never really be able to use it. The typical young student that I know, when "doing" exercises in this CD-ROM environment, will proceed in the following fashion: He/she will glance at an exercise, click to see the solution, say to himself/herself, "Oh yeah, I could have done that," and then go on to the next one. In short, he/she won't do the exercise and won't learn anything. As things are at present, the student faces the small psychological block of having to turn 850 or so pages and find the answer in the back of the book. I would like to think that that barrier serves as an impetus for the student to try to do the problem himself/herself.

I have forty years of teaching experience that tell me that hard copy textbooks, more or less of the traditional form, work. New, untested teaching technologies make me nervous. Of course we have to try them, otherwise we will ossify and never learn anything new. But we should be aware of the pitfalls, and engage in careful self-evaluation, as we proceed.

And now a coda on cost. It is not impossible these days for a textbook to cost $200 or more. If the book that you choose is expensive, be prepared to defend your choice. Is there an equally good book that costs just half as much? (I'm not talking here about *your monograph* on *your special subject*. Rather, I'm considering something like a linear algebra text, for which you should have less emotional involvement.) Checking the cost of the text for your class is just the sort of courtesy that you would have expected your instructor to show when you were a student.

2.13. Large Lectures

At many large state universities, and some private ones, it is common to teach some or all lower-division courses in large lectures. The large lecture situation offers special teaching problems. How can you, as the instructor, make yourself heard? How do you fill the room with yourself? How do you field questions? Do you really want the students to ask questions? If so, how can you encourage the students to do so? What about exams? How do you organize your teaching assistants?

Most large lecture halls come equipped with a microphone for the lecturer. Unless you have a voice like William Jennings Bryan, use it. If you don't use the mike, then either you will not be heard or you will be under such a visible strain that it will detract from what you are trying to accomplish. Like it or not, the instructor in a large lecture is putting on something of a performance. Of course you are not dancing the macarena, nor are you singing the blues, but you *are* trying to get through to an audience, and to engage them in the learning process. Obviously there will be some technique involved. If your face is beet red, and perspiration is popping out on your forehead, and your armpits are soaked with sweat, and you look like a nervous wreck, then you will not be a success at this job. Learning to use a microphone will help you to avoid these obvious liabilities.

You *can* learn to become relaxed with a microphone clipped to your collar. When you have done so, you will be able to speak in a normal voice and to be heard clearly. Your hands will be free and you can comfortably write on the board

and gesticulate and point to students and act in a lively and engaging manner. You can then concentrate on getting your mathematics across to the students.

One way to develop student involvement in the classroom is to encourage questions (see Section 1.5 on the importance of student questions). The discourse that is built around student questions is a critical part of the learning process. But large lectures impose severe time constraints, and severe communications problems. You must learn to handle questions in your large lectures with care. Too many questions will bring the lecture to a grinding halt. But a good one can make everyone prick up their ears. You have seen Jay Leno and David Letterman walk out into the audience and engage in repartee with select individuals. Those in the audience who have been selected are usually happy to participate. Unlike our students, the participant in the Leno or Letterman show does not stare at the floor, nor hold his/her breath until his/her face turns blue. What is the trick?

It helps that Leno and Letterman are celebrities. Everyone wants to talk to a celebrity. If you think that's all there is to it then you are kidding yourself. Leno and Letterman know something that perhaps you do not. And that is how to handle all different types of people who behave in all sorts of ways. Imagine, for instance, that you have picked out a student and asked him/her a question and he/she plainly is embarrassed because he/she doesn't know the answer. The inept and counterproductive way to handle the situation is to stand there and persist and embarrass the student further. A more productive way to proceed is just as you would proceed in your home if one of your dinner party guests spilled his wine or dropped his potato on the floor:

- Make a joke of it, create a diversion, or pretend not to notice;
- Affect to get distracted and then ask someone else;
- Say, "I must not have formulated the question very clearly" and then try again on the other side of the room.

As any book of etiquette will tell you, the quintessence of politesse is to make everyone feel comfortable—under any circumstances. Never forget to use these same skills in your classroom! Most of the Hollywood movies that depict a college classroom invariably show the professor standing before his students denigrating their intelligence and abilities—and the students lap it up! This may be poetic license, but it is certainly not reality. Show your students the same courtesy that you would have wanted to be shown when you were an undergraduate.

The remarkable book *One L* by Scott Turow [**TUR**] describes the life of a first-year law student at Harvard. Central to the experience described in the book is the notion that all first year law classes at Harvard are conducted by the "Socratic method." Note that first-year law classes at Harvard typically have an enrollment of 140. In such a class, the Socratic method consists of the professor, in the first few moments of the class, getting in one student's face and humiliating him for (as much as) the rest of the hour. And the students take it! They hate it, but they take it. And the consensus seems to be that it makes them better lawyers. [The movie *Paper Chase* starring Timothy Bottoms also dramatically recreates the first year of Law School at Harvard.] The way that Scott Turow describes the first-year law experience, he makes it seem as though a class of 140 can be like a class of 10. The professor at Harvard Law plays the class like a harp, and sets the students against one another in draconian ways. At the end of the book, Turow vilifies the experience. But it is clear that it has made him stronger.

I certainly do not advocate that you read *One L* and teach your classes accordingly. Freshman calculus students have neither the proven abilities nor the determination of first year law students at Harvard. But the book shows that a large lecture can be taught both powerfully and incisively. There is a skill to it, and it is one that we can all learn. At Harvard, if *One L* is to be believed, the catalyst to success is fear. But my experience dictates that other catalysts work as well. Communication, intellectual inquiry, and discourse are some of these.

Of course you want to know that your class is alive—that it contains living, breathing people. One way to do this is to make students comfortable with asking questions. Once you have created an atmosphere in your class in which people feel natural asking questions, then you have a foundation that you can build on. If they are at ease asking questions, then they can move on to making statements, formulating conjectures, suggesting lines of reasoning, or pointing out errors in what you have written on the board. It is this atmosphere that I strive to create in my own classroom, and one that I enjoy immensely.

But there is a trap. Left to their own devices, students will lapse into asking questions of the rote form, "How do you do problem 6?" Such questions must be discouraged in any class, but especially in a large class, as they are boring and non-instructive. If you do get such a question (and if you want to consider and then to answer such a question), then don't simply turn to the blackboard and record the solution for all to see. Instead, engage the questioner in discourse. "Have you tried the problem? How far did you get? Where did you get stuck? Did any of the rest of you have any luck with this problem? Did you get stuck in the same place? Does anyone want to suggest a way out of this mess?" It is too easy for a question like "How do you do problem 6?" to degenerate into a private discussion between a single student and the instructor. It is also difficult for the other students to pay attention when you are addressing the needs of a particular individual. Endeavor to turn an individual's question into more than what it is. If you cannot use it as a catalyst for a useful classroom discussion, then tell the student to see you after class.

What you really want are questions like, "Why don't we define 'continuity' this way?" Or, "Why does the chain rule have this form rather than that form?" It is up to you to *prompt* the students for the questions that you want. In order that they not become rhetorical questions, you must put these issues to the class and then *wait for an answer.*[18] It is not enough to say, "Why does the product rule have this form? Well, here's why." If you want a reaction from your class, you must draw it forth.

When a student asks a question, *repeat it* so that you can be sure that the entire class has heard it (and that you have *understood* it). Write the question on the board. This is sound policy even in a small class. If you do not repeat the question, then the interchange between you and the student becomes a private conversation. The rest of the class is excluded. If other students (those who are sufficiently interested) are interrupting with "Huh? I can't hear. What's the question?" then you

[18]This classroom technique has been studied in detail by experts in the psychology of learning (see [**MOO**]). One such study recommends that, after you formulate a question to the class, you wait 30 seconds—but not more. Less than 30 seconds does not give students enough time to formulate an answer; more than 30 seconds is wasting time.

are wasting valuable class time and also losing control. Other private conversations will start up. Your class will go badly.

But there is another important consideration to repeating the student's question. If the question is not optimally formulated (or just plain wrong) then the repetition gives you an opportunity to clean it up or rephrase it. Then treat the issue raised with respect and answer it directly.

It is especially important in the large lecture situation that students be sure that you will not belittle them or make them look foolish in front of the other students. Be prepared to make even a dumb question look smart. Writing the question on the board and repeating it out loud gives you a chance to turn the question into something that you can answer, and that will make both you and the questioner feel witty and wise.

If the first question that you field gives rise to a second, then say something like, "Let's go back to the lecture for a bit. I think it will clarify this point for you." Or you can say, "This question session is getting a bit too specialized. Why don't you see me after class?"

There are virtually no data to support the contention that small classes are "better" than large classes for mathematics teaching. Statistics do not indicate that students in small classes perform better or retain more. The statistics *do* indicate that students feel better about themselves and the class, and enjoy the situation much more, if the class is small. Another way to say this is that large lectures are not a good tool for *engaging students in the learning process.* Just as nineteenth century social theorists noted that factory workers on an assembly line easily can become alienated from the work process, so students who are educated in a large class (that smacks of an assembly line) can become alienated, and therefore will not learn as well. An awareness of this problem, on the part of the instructor, is an important first step in dealing with it.

The role of intuition in our lives should not be minimized. And our intuition is that small classes are better. Why is this the case, and why is our intuition inconsistent with the statistics cited in the last paragraph? The answer (as Len Gillman has patiently pointed out to me) is that the advantages of small classes are intangibles: The friendly give-and-take between instructor and students (eminently possible in a small class but quite difficult in a large one) is a form of encouragement, and a way to make the subject seem fun and exciting. In a small class it is likely that you can cover more material more efficiently, thus you will have time to treat ancillary topics that will whet the students' appetites, and may cause some of them to decide to be math majors. The main point is that a small class is *personal*, while a large one is not. You would not want to have your annual physical exam in a large auditorium with 200 other people. You probably do not want to learn calculus in that fashion either.[19]

One device that works very well (when teaching a class either large or small), if you can manage it, is to make yourself available in the front of the classroom

[19]The main campus of Penn State has about 40,000 undergraduates. It used to be, when I taught there, that calculus was taught in *very* large lectures. Several hundred students per class. Use of a microphone was essential. Teaching such a course was an ordeal, to say the least. And the level of student complaint was considerable. Even the Dean's office got a fair dose of student complaints. So they decided to teach calculus in small classes of thirty—and they convinced the Dean to provide the resources to make this happen. And guess what? The level of compaints has fallen nearly to zero.

for fifteen minutes after class. Students feel much more comfortable talking to you when surrounded by their peers, and while their questions are fresh in their minds.

Never, ever get involved in a personal discussion of grades in front of a class of any size. If student T wants to know why problem n was given only p points, tell that student to see you privately.

It is imperative that the instructor for a large lecture course be extra well prepared. If you begin to get lost when doing an example or sidetracked with an incorrect explanation then you will quickly lose a large segment of the audience, a lot of talking will start to take place, and the room will soon be bedlam (see also Section 5.5 on discipline). Everyone has off days and makes mistakes, but you must take extra care in a large lecture to have the material down cold.

The teaching of a large lecture course offers complications of a special nature. Discipline and commanding attention are two of these that are treated elsewhere in this book. But there are others. You *must* have a syllabus for such a course. You *must* prepare your homework assignments and exams carefully—and well in advance. There are few things more unpleasant than facing down a hostile audience of 350 hungry freshmen right before lunch. Therefore do not give exams on which the problems don't work out; do not give homework assignments on which the problems don't work out; *do* plan ahead for *all* activities. Prepare and prepare and prepare some more. Have a fair and objective system of grading. If a student comes to you with questions about grades, then have a fair, consistent, and clear set of data to show the student.

If you are the professor in charge of a large lecture, then you will probably be in charge of a group of 2 to 10 or more Teaching Assistants (TAs)—refer to Section 2.16. You must exercise organizational skills with them as well. Meet with them once a week to be sure that they are covering the right material, are aware of upcoming assignments and exams, and to apprise them of any difficulties that have arisen. Make regular use of email to keep in touch with your TAs.

If the TAs are helping you to grade an exam, then you must tell them how you want the papers graded (see also Section 2.10 on grading). Grade exams *horizontally* rather than *vertically*. This means that you should put TA #1 in charge of problem #1 (on all exams), TA #2 in charge of problem #2, and so forth. This is the only way to insure some consistency. If you let each TA grade a stack of exams from start to finish, then you will have wild inconsistencies and many student complaints.

Horizontal grading is also a useful device even when you are grading a stack of just twenty exams all by yourself. It will discipline you, it will make your work more accurate, and it will tend to make the job go more quickly.

At a large university—with 30,000 or more students—there may be several large lectures of the same calculus or linear algebra course running at the same time. If you are in such a situation, you will often find it convenient to work cooperatively with the other lecturers (in some departments you may have no choice). In fact students in this situation seem to value a sense of overall fairness and uniform treatment more than they value the flair and pizzazz of the individual instructor's personal style. Thus you may find it useful to meet regularly with the other lecturers and to hammer out some uniform policies, and even uniform treatment of the topics in the course. You may wish to have common exams, and to take turns writing them.

The article [**MOO**] contains a sensible discussion of how the precepts of the management concept TQM (Total Quality Management) can be used to guarantee that the students are treated fairly in this type of learning environment.[20]

Here is a trick that some professors teaching a large lecture have used with success. The professor recognizes that students in a large lecture can develop a feeling of alienation. Such students are afraid to approach the professor, afraid to go to office hours, afraid to ask questions in class, afraid to lodge complaints. Therefore, at the beginning of the term, the professor asks for two or three students to volunteer to be the class *ombudsmen*. As you know, an ombudsman acts as a go-between: he/she fields questions from the constituency and presents them (with no mention of the source) to the professor. It is not difficult to see that this little device can serve to open lines of communication. Students are much more prepared to present their concerns to a peer (thus preserving their anonymity with the instructor) than they are to confront the professor one-on-one. Good ombudsmen will be able to answer trivial concerns without even getting the professor involved (because the ombudsmen will, as a matter of course, be meeting regularly with the professor). The ombudsmen will also consolidate and clean up student complaints and present them to the professor in a manner which the professor will find agreeable.

Faculty who have used student ombudsmen in the manner just described report that **(i)** it is a decisive means for bridging the communication gap between professor and students when a class is large, **(ii)** students respond readily and well to peer ombudsmen, **(iii)** the ombudsman device is a good way for the professor to develop a close relationship with at least some of the students in the class, and **(iv)** students will volunteer to be ombudsmen if they are made to understand that a professor can write an especially good letter of recommendation for a student whom he/she has come to know in this capacity.

It is tricky in a large lecture to help the students get to know you as a person, to cut through the barrier that always exists between the person in front of the room and the large audience in the back of the room, and to keep the lines of communication open. You know that successful performers can do these things. You know that preachers can do it. And you know that skilled teachers can do it. One of your career goals should be to develop this talent yourself.

2.14. Problem Sessions, Review Sessions, and Help Sessions

At many big universities, the large thrice weekly lectures in a lower-division math course are supplemented by once- or twice- weekly "problem sessions" or "help sessions." Usually the lectures are delivered by a professor or instructor while the help sessions are staffed by graduate student teaching assistants (TAs).

Imagine that you are the graduate student in charge of a problem session. It is easy to fall into the trap of not taking the work very seriously. After all, student attendance at these sessions is poor in general and spotty at best. Students seem to be inattentive and their questions are often puerile. But the quality of any class or help session is largely influenced by the attitudes and efforts of the person in

[20] I note that TQM—a management technique borrowed from industry—is an emotion-laden topic in the educational setting. I shall not try to treat it here. But see [**MOO**] for a quick, if not impartial, introduction to the idea.

front of the room. If your attitude is to treat the help session casually or carelessly, then you will get correspondingly disappointing results from the students. Consider giving weekly quizzes, sending students to the board, and other devices for livening up your problem session. I wish to concentrate here on more mundane matters.

It is arguably more difficult to conduct a good problem session than to give a good lecture or class lesson. For the problem session presents all the difficulties of a class period, and more. At least in a class lecture you are in complete control of the order of topics and can, if you wish, present them from prepared notes. In a problem session, if you really let the students ask what they wish, then you must be ready for anything. And you must be able to think quickly, on your feet, of the best way to present any given topic, give a hint on any problem, or handle any point of confusion. In a class or lecture you can always pull rank and say, "There is no time for questions now. See me in my office hour." (I don't recommend that you say this very often, but it is an option that is available). But help sessions are for questions.

If you are a novice, then it is probably safest to view the help session in the most naive way. Your role is to help students do their homework assignment for *that week*. Thus your preparation for a help session might consist of working all the homework problems for the week, or at least staring at them long enough to be sure that you know how to do them.

Be certain that the techniques that you present are consistent with those used in class and in the book. Some professors require their TAs to attend their classes, just to insure this consistency. Such a professor might even do a spot check of the grader's work, or drop in on help sessions to see how things are going.

I know of at least one professor who works closely with his grader and his TAs by attending, once per week, each problem session for his class *accompanied by the grader!* This requires some extra effort on everybody's part, but it shows real consideration for the student who has questions about the way that his/her homework was graded (or how the class, as a whole, is being conducted). It goes without saying that, in order to use this device to good effect, the professor will have to be well-coordinated with the grader on how he wants each homework assignment graded.

When you are helping with a homework problem that is to be handed in, don't give away the store. One reasonable answer to the dreary question, "How do you do number 14?" might be, "I'll do number 16 for you, which is similar." Another reasonable answer might be, "I'll get you started. You do the rest." A third is, "Here is an outline of the basic steps." The truly skillful instructor will turn this question-answer session into a team effort. Gently goading the students with his/her own prompts and questions, this instructor will resist simply doing the requested problem for the student. The trouble with just solving the problem—and nothing more—is that only the requestor and perhaps a few others will be paying attention. If instead the instructor can generate some repartee, and can get the students to want to pitch in, then there will be considerable student interest and a number of class members will learn from the experience.

Implicit in the last paragraph is the observation that the TA-led problem session can be an opportunity for active learning (see Section 3.7 for a discussion of this idea). The problem session is already a relatively small group, and the setting is informal. It is natural for the instructor (the TA) to pose a question and tell the

students to discuss it with their neighbors. Or to get people to go to the board. Or to get students to pose problems themselves. Certainly, with a little imagination, it is possible to turn a problem session into a lively interchange rather than a boring list of "How do you do problem 16?"

There are subtle psychological forces at play in the scenario just described. If each student is worried about protecting his/her turf, and simply does not want to share what he/she knows, then you will have a hard time generating useful dialogue in your problem session. If instead the atmosphere is one of learning being a sharing activity, and of giving knowledge in expectation of receiving knowledge, then the problem session can be a worthwhile and nurturing experience for everyone. (We all know of mathematicians who collaborate easily and well, and of others who seem to be thoroughly incapable of collaboration. Perhaps these differences reflect attitudes similar to those being described here.) Of course you as the TA or instructor must set the example. If the signal you send is that *you* are not willing to help, that *you* are not willing to share, that instead you are like the oar master on an ancient galley, then you will get little in the way of cooperation and sharing from your students. If instead the example you set is one of patience and giving and caring, then you are likely to be the beneficiary of an enthusiastic response.

The advice to the TA (five paragraphs ago) to work all the homework problems the night before a problem session is one that I tender hesitantly. I never do this, but I've been teaching math for forty years. I am rarely surprised by any question in a calculus class or help session and, even if I am, I can usually slug my way through whatever new features are present. If I am at a review session for an exam and a student presents a really difficult question then I always have the option of saying, "That's an interesting question, but one that could never be put on the test. Let's discuss it privately."

In your first few years of teaching you will have to strike a balance between being thoroughly prepared (by working all problems in advance) and spending too much time on preparation (see also Section 1.2). Just remember that a large part of your job is **(i)** to show the students how to do the problems and **(ii)** to persuade the students that the problems are doable (by ordinary mortals). If you fumble around and act baffled by the problems, then you are presenting a poor role model and, more to the point, doing your job badly. Students find appealing the fact that I can do all the problems and that, moreover, I invariably know where the difficult spots are and can help them to chart their way through them. This ability can only come with experience. It is the model that you should strive to attain.

2.15. On Being a TA

Being a Teaching Assistant (TA) provides some experience in being a teacher. But it does not provide much, and the glimpse of teaching that it provides can be misleading.

When you are a graduate TA at a big state university, you are probably not your own boss. In most cases you work, alongside several other TAs, for some professor who is delivering lectures to a large class. On alternate days, the class will be broken up into smaller "quiz sections" or "problem sessions", and you will be asked to teach one or more of these (see Section 2.14). You will also be asked to help with grading, with other assigned activities, and (primarily) you will be asked to do what you are told.

Being told what to do lifts a great deal of responsibility from your shoulders. But this also means that a TA has never really taught. You've had some experience standing in front of a group, organizing your thoughts, answering questions, developing blackboard technique, and so forth. But you will have never made up an exam, written a syllabus, designed a course, given a course grade, or any of the dozens of other activities that figure significantly in the teaching process.

However, if you have never been a TA (either because in graduate school you were on a fellowship that had no formal duties attached to it, or perhaps because you were educated in another country), do not despair.[21] At least you are entering this profession with possibly fewer prejudices than are held by those who have stood as a TA before a hostile audience in this country. Perhaps reading this book will provide you with better information and a better outlook than having served as a TA under a professor who doesn't even care about good teaching.

Let me put an ameliatory note here. Some professors are well aware of the down side of being a TA and attempt to compensate for it. They give their TAs more responsibility. For instance, such a professor might write the first midterm exam for a class himself and then let the TAs write subsequent midterms (under close supervision). This is positive psychological reinforcement for the TAs, and good experience for them as well. Likewise, the TAs can be allowed to set the curve for grading (under supervision) and to perform the other ordinary functions of the instructor. The professor is not being lazy here. Rather, he probably has to expend more effort than if he were doing these tasks solo. But it provides awfully good experience for the graduate student TA.

At some schools, the TA is more autonomous. It is possible that the TA will be a free-standing teacher, creating his/her own exams and constructing his/her own grading system. If this description applies to you, then this section of the book does not. But the rest of the book does, and you may benefit from reading it.

For more information about the day-to-day duties of being a Teaching Assistant, see Section 2.14.

2.16. Tutors

A commonly asked piece of advice, usually from a student having trouble in your course, is, "Should I get a tutor?" I have a very simple answer to this question: "No." It is almost unavoidable that the student will treat the tutor as a crutch. The student figures that, by paying $35 per hour (or whatever is the going rate), he/she is *buying* knowledge. And now looms the specter that to my mind should be the benchmark for all educational issues. *All learning of significant knowledge requires considerable effort on the part of the learner.* This fact has not changed since Euclid told Ptolemy (over 2000 years ago) that, "There is no royal road to geometry." Instead of just slugging his/her way through a new idea, the student finds himself/herself thinking, "I don't get this. I'll have to ask the tutor."

I could go on about this point at length, but I will try to restrain myself. Go to any athletic facility and you will see young people spending hours perfecting their free throw or their skate board technique or their butterfly stroke. They don't hire tutors to achieve those goals. They also don't hire tutors for learning to build

[21] I must make the following caveat: These days, when you are applying for your first job, you had better have some teaching experience on your CV. If not then you will be passed over for sure.

model airplanes or learning to modify their cars. The reason is very simple. There is plenty of peer support for these activities. Young people are highly motivated to be proficient at them. An eighteen-year-old understands clearly when an athletic coach says, "No pain, no gain." However the same concept makes little sense to him/her in the context of mathematics or another deep academic subject.

It is a sad fact that many students—and their parents too—view the university situation in the same way that they view buying a car: You pay your money and you take your choice. The professor is expected to deliver an education (in exchange for the big bucks) in the same way that your local Ford dealer is expected to deliver a car when you fork over your down payment. The college instructor who says, "I am a scholar, and I set a standard, and I expect my students to rise to it." may find himself/herself in a very lonely place. I certainly do not think that such an instructor is misguided. Far from it, I agree with him/her wholeheartedly. But I also realize that, if I expect my students to rise to a certain standard, then I must teach them that this is a worthy goal, and then I must show them how to do it. It's not so hard, once you realize that that is what you must do.

A good math student must be self-motivated. In most instances, the hiring of a tutor is an attempt by the student to buy his/her way out of some work. I've been a tutor. It's a great way for a young person to make some extra money. But in most instances it is not a beneficial learning device. You might find it helpful to refer to Section 3.2 on math anxiety in connection with these issues.

Of course there are exceptions to what I am saying here. Some students are too timid, or too slow, or too far behind to catch up without help. Sometimes a student will have a legitimate and doctor-certified learning disability. If a student has been ill for several weeks, or has had a death in the family or some other personal crisis, then a tutor may be the only alternative.

It is a sobering thought to realize how different the students' point of view is from our own. There is at least one high quality large state university today where students routinely hire a tutor for each class that they take—*before they have even set foot in the classroom.* Clearly these students have convinced themselves that classroom instruction is inadequate, or that their own abilities are substandard, or that they do not know how to study and require a surfeit of hand holding. On days when you think that teaching is a straightforward process, stop and ponder this matter.

In any event, if you are a paid instructor at a college or university, then do not hire *yourself* out as a tutor for a student in a class that *you* are teaching. It is inappropriate, it is tawdry, it is a conflict of interest, and it might get you into trouble with your department. The safest policy is not to tutor students at your institution at all. The point is that you are already being paid a salary by your school to educate the students at that school. To further accept tutoring money from the students constitutes double dipping.

Even having to recommend tutors can put you in a position of conflict of interest. Most math departments maintain a list of qualified people (usually graduate students, but perhaps some undergraduates also) who can tutor for math courses. This is done as a service for the students, but it is also done as a service for the faculty. When a student asks you about tutors, send that student to the departmental office and the official list. It really is the best policy.