
SUCCESS TIPS

Purpose of the course: Our purpose is to learn the language of calculus, master its concepts and procedures, learn how to apply them and learn how to speak and write in calculus.

Another goal of this course is to exercise your ability to think, something that will benefit you even if you never use some of the material we covered. Expendng mental energy has never been found to harm anyone - on the contrary! Just like muscles are developed by straining them and not by lying on the couch, brain power is increased by using it and not by watching TV!

How to study: The best results come from understanding what you are doing. Understanding the material comes with a higher initial time investment, but it pays off later.

The first thing on a student's mind is usually solving problems given for homework. *HOW NOT TO DO HOMEWORK* is to look at the homework problem and flip back through the section in search of similar problems. (You might as well admit it - you do it, don't you?).

Instead, you should do the following:

- Have a pencil and scratch paper ready. Mathematics is not read like a novel - it is more of a sing-along where you follow the computations that you are reading with your own computations on paper. It is also good to read to a point where you understand what comes next and then to try to do the next step yourself. (You will typically already know how, since solutions to new problems are typically assembled from pieces that you have seen before.)
- Start by reading the class notes pertaining to the section you are doing homework over. This will give you an idea for which material and what kinds of problems I think are important. Make sure you understand the methods for solving the examples done in class.
- Then read the section in the book. Identify ideas that were discussed in the lectures and work out the additional examples presented in the book if you need to reinforce these ideas or methods of solution.
- Since the book is far more comprehensive than the lectures could ever be, there will be examples in the book that are unlike things that were done in class. Those examples are good reading (and you should read them), but don't have such a high priority, so may be skimmed through if you don't have much time (and you usually don't, right?)
- **ONLY NOW** that you have understood what the section is about should you start solving the homework. If you have performed the steps above, this should not be difficult. When you are done, it is a good idea to check your answer if the problem is an odd-numbered one and the answer is in the back of the book. On occasion it will happen that a homework problem is unlike anything you have read in class notes or the book. For example, it could be like one of the problems in the book that you skipped when reading through the first time - now go back and read it. Or it may be something unlike those examples, in which case the problem usually requires putting a few facts together, some of which may come from previous sections.

Getting help: If you are having trouble, arrange a time to come and see me. Do this as soon as possible and not fifteen minutes before a quiz or the day before the test! Note, however, that this time should not be viewed where you come with a blank sheet and I work out the problems for you. You should have attempted the problems you couldn't do on your own and should be prepared to tell or show me what you tried.

Writing down the solutions on quizzes and tests: When you are writing up a problem, your goal is to convince me that you understand and can apply the technique needed to solve the problem. This means that the procedure is far more important than a correct answer and the only way I can evaluate your procedure is if you show it to me clearly. Thus, your work should show all the steps. If you are using a certain theorem, then say so. An answer to a question is not a 'Yes' or 'No', but a sentence with justification. Furthermore, there are certain rules ('mathematical grammar') how mathematical text is written down: follow them! (For example, the most common breach of these rules is when you write equals signs all over the place, often to mean 'it then follows'. Equals signs are for things that are equal and nothing else. You may use arrows to say 'it then follows'.)

Even though I tend to take little off if you make a small algebra mistake, doing the computations correctly is important. One reason is that an error early on can either make the subsequent computation too difficult (so you are stuck) or too easy (so you are solving a simpler problem than I intended, which is worth less). Don't be too lazy to write an extra line or a set of parentheses - a lot of points were lost by people who thought they could do things mentally. Again, don't forget that even if your answer is completely correct and it is clear that you could not have obtained it in any other way but by following the correct procedure, if I do not see this procedure on your paper I can give you only little credit. For all I know you could have copied the correct answer from your neighbor!

Finally, write your solutions neatly and in an organized way. Messy and unorganized papers annoy me and leave me with the impression that you don't know what you are doing. NOW, DO YOU WANT ME TO BE ANNOYED AND UNDER THE IMPRESSION YOU DON'T KNOW WHAT YOU ARE DOING WHEN I AM DECIDING HOW MANY POINTS TO AWARD TO YOUR EFFORT?

Preparing for a test: If you did the work assigned for homework, this should simply amount to reviewing. Start several days before the test. Make sure you have all the basic stuff down (most of the tests usually deal with basic skills, only a few problems are more involved). Look at the review problems at the end of the chapter and work on them. If some of them are not going so well find the section from which they have been taken and study it again. Finally, and this is probably the single most important piece of test-taking advice that I can give you as well as the most ignored one: GET ENOUGH SLEEP on the night before the exam.

I don't even want to give any advice to people who start studying seriously the day before the exam. This is a very ineffective method so don't be surprised if it gives poor results.

Taking the test: You probably know these tips already. Do the easy problems first. Since a lot of people do the problems in the order they are given, I try to arrange the problems so they go from the straightforward ones to the more involved ones (though sometimes the availability of space on pages interferes with this intention). If you don't have a clue on how to even start a problem, skip it and come back to it later. Also, it can't hurt to ask me a question about a problem during the test - the worst that can happen is that I tell you that I cannot answer the question or that this is a problem you should know how to do, since we did it in class.

Good luck: hopefully these few tips will help you see better what I want to see from you and how you can provide it. I enjoy giving deserved good grades as much as you enjoy receiving them! Here's to having as many of those as possible!