

Study Techniques & Test-Taking Strategies for Calculus Students

Study Technique 1: After each lecture, read/skim through your lecture notes and then work on the assigned homework. Try to keep up with homework and use the Math Clinic or GTA or instructor for any questions on which you are stuck. A study technique that is very effective when working through the homework is the following. Do the first two questions assigned; then redo them both, and do the third; then redo those three, and do the fourth; then redo those four and do the fifth, etc. This study technique allows different, but related, ideas that arise in different questions to connect, and so allows students to see the big picture of what is going on while, simultaneously, learning intricate details.

Study Technique 2: While working through homework, it is very tempting to use a solution manual. Solution manuals can be very helpful and very effective, but only if used correctly. The correct way to use a solution manual is, if possible, to read the first one or two lines of a solution and then try to continue the problem from there without looking at the manual's solution again. If that is not possible, then read the solution all the way through, but then close the manual and try to reproduce the solution (or at least the main ideas of the solution) without the aid of the manual.

Study Technique 3: After you complete your homework, read the section(s) in the textbook that will be covered in the next lecture. It is likely that you will not understand everything you read; however, reading the sections before lecture will help you understand what is presented in the lecture.

Study Technique 4: Try this technique to help you prepare for a test. A couple/few days before the test, look over all the homework. The day/night before the test, look over the homework again, and ask yourself what the key concepts and methods are per question (WITHOUT reworking the questions). Jot this down on a sheet of paper and when you are done, compare with the solutions to see if you were correct. Any question in which you were on the wrong track, look over your solution to it to make sure you see what the main idea is. This work the day/night before will help get your brain to think faster and bring the material to the front of your brain to help you think faster during the actual exam.

Study Technique 5: Study with a friend to help you prepare for a multiple choice test as follows: Student A works problem A for the first time and student B works problem B for the first time (not homework problems). After you individually solve your problems, you think of possible mistakes and each of you turns his/her problem into a multiple choice problem. Next, exchange problems so that the other student sees the problem for the first time as a multiple choice problem. This might help you in several ways: more study time, can be competitive, can see potential mistakes so you won't make them in the future, and helps get you ready for multiple choice type questions.

Study Technique 6: Another recommendation for preparing for a test is to go over a practice test (or a former test, or a test you have written using questions selected from the homework) and simulate a test atmosphere (no lecture notes, no phone calls, no TV, no radio, etc) while working the test. If you run out of time, draw a line across at the "time up" mark, and continue to work the test, and write down how much extra time was needed to finish the test. This will give you an idea of how fast you will need to work in order to finish the real test. Ideally, you will have time to enact such a simulation a few times with different practice tests, and so get adjusted to the test atmosphere.

Study Technique 7: If you have already done tests in the class, and if you have solutions to those tests, then two days or more before the test, look over those previous tests and their solutions, and a day later, without relooking at those tests, try to rework them in a timed environment, simulating the atmosphere of the test, and see if you can do them each in the time allowed. Then compare your

solutions with those from the tests.

Study Technique 8: Think back to past tests on which you have done well in the past few years. Were there common things you did for those tests that you can repeat now? Did you get lots of sleep the night before, or just a few hours? Did you study during the few hours prior to the exam, or relax in that time? Different things work for different people, so you need to figure out what will help *you* do your best. (E.g., contrary to respected scientific theory, some people do better on exams if they only get at *most* 3 hours sleep the night before a test!) Do not listen to peer pressure, but think back on *your* past tests on which *you* did well in the last few years and ask yourself what was common to those situations to find out what will/might work for you now. If you can find study techniques that work well for you in this class, then those techniques are likely to work well for you in many of your classes.

Test-Taking Strategies:

Read through the entire test first, marking the questions as one of 4 categories:

Type (1): These are questions you know how to work and their solutions are quick/easy. You may even want to work the problems in this category on your read-through.

Type (2): These are questions you know how to work but their solutions will require some time.

Type (3): These are questions that you think you know how to work but are not sure of. You may need to try one or more methods to find a solution.

Type (4): These are questions that you have no idea how to work.

After you finish reading the test, go back and work all the category (1) questions, if you have not done so already. Then proceed to category (2), then (3) and finally (4). It may be that as you begin working a problem, you find that it needs to be reclassified. A (2) problem that you thought you knew how to work turns out to be harder than you think. If so, label it a (3) or (4) and move on; come back to it after you finish all the (2) problems.

This technique helps you to manage the time allotted for the test in the most effective manner. It prevents you from getting stuck and using up too much time on a hard problem, thus missing the opportunity to earn credit for problems that you could have done. The technique can also provide a psychological boost. If you find that a significant number of the problems are type (1) and (2) and you are able to work these, then you may have more confidence in tackling the type (3) and (4) problems. It may also be that your work on type (1) and (2) problems will cause you to think of something that will help you on the type (3) and (4) problems.

Sometimes you think you have worked a multiple-choice problem correctly but your answer doesn't match the available ones. You should check your work carefully to see if you have made a computational error. You should also check to see if your answer is equivalent to one of the available choices. Try

factor your answer to make it match one of the choices

if your answer is factored, multiply it out to see if the answers match

use trig identities to get equivalent forms

It is important to take time to check all your work. If there is a scantron or an answer sheet, double check that you have entered answers correctly. Reread the test instructions to make sure that you have followed them correctly.