Tips for Success in Undergraduate Math Courses

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This guide was written with the calculus student in mind, though the tips are applicable to many undergraduate math classes. In the type of course this guide addresses, you will be successful *if and only if* you can do well on the exams. So essentially, this guide gives tips for doing well on your math exams.

The first thing to realize in this course is that you can't cram for your math exams. To be successful, you basically have to start at the beginning of the quarter and put in a lot of mathematical effort each week. In fact, if you follow the tips suggested, you may even find yourself working harder than you've ever worked before in a class. However, you'll feel your work paid off after your first successful exam.

Listed below are my study suggestions broken up into things to do daily, weekly, before, during, and after an exam to ensure you do well.

- **Daily: When attending lectures and section:**
    1. Keep a list of THINGS TO MEMORIZE.

        These include definitions, such as the definition of a limit; theorems, such as the Intermediate Value Theorem; and other things you'll need to remember, such as the derivative of cos(x).

    2. Watch for example problems.

        Write example problems in your notes in such a way that you can cover up the solutions and try doing them on your own. After class, try doing them on your own. If you find any example problem to be hard, put it on your HARD PROBLEMS list, explained below.

- **Weekly: When doing your homework:**
    1. Know how to do every homework problem assigned!

        Homework problems are your best preparation for exam problems. They're likely to be very similar to the types of problems that show up on exams. Therefore, doing your best on each homework problem is one of the most important things you can do to prepare for tests.

        Start the homework at least a few days before it is due to be sure you can give each problem your best effort. It is not unusual for even the best students to get stuck on problems and need extra time and help. Given that fact, don't be afraid to ask friends, TAs, or instructors for help when you need it.

    2. Keep a running list of HARD PROBLEMS.

        These are the problems you'll want to practice. They include any problem you had any difficulty with at all! You'll take them from the homework, examples in class, and other practice problems.

        With the HARD PROBLEMS: Practice doing these problems over and over until you can *write down* the complete correct solution without peeking at the solution or getting help.

Then: Try similar problems until you can do them without help. You can often find similar problems before or after an assigned homework problem in the text. If not, your TA or instructor can usually make some up for you.

3. When you get your homework back: Look over the things you got wrong.

   If you made more than a simple algebraic error on a problem, try rewriting the problem completely until you can do it perfectly without help or hints. Put the problem on your list of HARD PROBLEMS.

- **(Starting a few days) Before the Exam:**
  1. Review your list of THINGS TO MEMORIZE until you have them in (at least short term) memory.
  2. Look over the problems on your HARD PROBLEMS list, and make sure you remember how to do them all.
  3. Find a quiet place, set a timer for the amount of time you'll have in the exam, and take the practice test. Don't look at the practice test before you do this.
  4. When time is up, stop. Circle the problems you couldn't finish.
  5. After circling them, try to finish all the problems you couldn't finish during the timed period. Put these problems on your HARD PROBLEMS list. You'll need to practice doing them quickly.
  6. Go through the practice test with the solutions. Check your work. Put anything you missed on your HARD PROBLEMS list.
  7. Practice doing the HARD PROBLEMS over and over until you can write down the complete correct solution without peeking.
  8. Repeat as necessary.
- **During the Exam:**

  Remember:

  1. If a problem is hard, skip it and come back later.
  2. Do a quick check of each problem to be sure your solution is reasonable. E.g. if the problem asks for a distance, is your solution positive?
     If your answer is not reasonable, mark it and come back to it later.
  3. Write *SOMETHING* on every problem. The grader really wants to be able to give you some partial credit.
  4. When you've tried everything, go back to the problems worth the most points first.
  5. Given time, double check your algebra carefully!
- **After the Exam:**
  1. How did you do?
     - Really well! My hard work paid off!

       Keep up the good work. Be careful not to get too confident and slack off. Unfortunately the course just keeps getting harder, and future tests will usually make up a larger portion of your grade than early ones.

     - Ack! I did worse than I had hoped to do!

       Look over the test. See what you got wrong and why. Try to figure out why you didn't do as well as you'd hoped. Did you study the wrong problems? Did you make careless errors? Was the test on a bad day?

       Come up with a strategy for doing better on the next test. Talk to your TA or instructor about it. They can offer suggestions and help you keep up on your study goals.

Finally, if you didn't do as well as you'd hoped, it's not the end of the world - or even the end of your chances of doing well in the course. The next test will probably be worth more of your grade than this one. You can start making it up then.

Good luck in the class this quarter. Remember to take advantage of the help of the TAs and instructor.

The above material was found at http://web.stanford.edu/class/math41/jasp.html.