

General Study Tips

***** Try to get 7 – 9 hours of sleep regularly but especially the two nights before exams. I cannot stress enough how important sleep is. Trying to memorize something when you're tired is less effective, and if you're tired during your exam, you're more likely to make mistakes like "7*7 = 47" on the exam. Caffeine will never do for your brain what sleep can. *****

My tips for during an exam:

- Before the exam, close your eyes and take a deep breath.
- Read each problem and look for problems you immediately know how to do. (Starting with difficult problems will increase your stress and may make completing easier problems more challenging.)
- Take your time! With multiple choice exams, it's better to complete 80% of the questions perfectly than it is to rush through all of the questions and risk making small mistakes that may lead you to the wrong answer choice.
- If you find yourself stuck or going in circles on a problem, it's okay to erase everything (time permitting) and start again. Sometimes it's more difficult to spot a mistake than it is to restart the problem and avoid making the mistake again.
- If you are feeling stress, anxiety and/or frustration building during the exam, **close your eyes and take a few deep breaths.** I know I sound like a life coach, but for me, closing my eyes takes me out of the exam environment, and taking a deep breath helps me calm my thoughts and heart rate. If you're worried about wasting time doing this during an exam, try it first during homework or quizzes to see if it helps you.

My suggestions on how to study for exams:

1. First, read through your notes and try to do the examples on your own. Make a list of which sections/lessons are the most difficult for you.

2. Practice homework or textbook problems from the sections that you found the most difficult.

3. If you have practice exams or practice questions available to you, NOW is the time to use them.

Pick one exam or one exam's worth of questions (i.e. you have a list of 100 practice questions and your exam will have 12 questions, then pick 12 questions which roughly represent the exam material).

Do the practice exam under exam conditions. Time yourself.

Do not use anything that you cannot use on the exam.

Doing the practice exam under exam conditions is the best way to gauge how you'll perform on the actual exam. Working through practice exams while referencing notes can give you a false sense of confidence. If you need to reference your notes to answer a question on a practice exam, then you do not know the material well enough to answer it under exam conditions.

4. Once you've taken the practice test, sort the problems into 3 categories:

(a) Answered quickly *and* either correctly or mostly correct

By "quickly," I mean "in a reasonable amount of time for the exam;" i.e. if you took a 12 question exam in 60 minutes, did you take about 5 minutes to answer the question?

By "mostly correct," I mean that you understood the content, but you made "minor" errors like " $7*7=47$ "

(b) Answered incorrectly *because you did not understand the material*

Do not include problems that you missed because of "minor" errors

(c) Problems you got mostly correct but took a long time i.e. on a 12 question exam done in 60 minutes, did a problem take you 10 minutes or more?

5. Focus on problems in category **(b)** first. Go back to notes, homework problems, and textbook sections corresponding to these problems. Look up additional explanations and problems online. Practice until you feel more confident with these problems.
6. Next, focus on category **(c)**. Because you know how to do these problems, don't worry about reviewing this material from your notes or textbook. Instead, spend your time doing as many practice problems from the course resources or reliable internet sources as you can. Keep track of patterns you recognize when solving them to help speed up your process.
7. If possible, repeat steps 3-6 as many times as necessary.

To avoid spending many hours cramming right before an exam, try to **master each lesson as you learn it**. Here are some suggestions to retain the material better as you learn it:

1. It is often difficult to understand new material while writing notes during a lecture.
Action to take *before* class – try to skim the textbook or any available notes before coming to class so that you're somewhat familiar with the material. This will help the lecture make more sense while you're listening to it.
Action to take *during* class – many professors say very important things without writing them down. Try to write down what a professor says while copying what they write. If necessary, **ask a professor to repeat something**. If it sounds important or if they tell you it's important, you can also ask them to write it down.

Action to take *after* class – rewrite your notes sometime between class and doing your homework. Try to make them as neat as possible and write down any connections you make that will help you in the future when you use the notes to study. If there are steps you didn't understand during class, try to understand them now (ask the professor, ask a fellow student, ask the internet, ask a tutor). Once you understand the steps, **write down the explanation**. This will make studying your notes quicker and easier before the exam.

2. Treat homework assignments as forced (well, at least graded) exercises to practice for the exam. Because that's what they are. Because of how busy students can be, the focus often becomes *completing* an assignment or getting the points for an assignment. Sometimes, this can't be avoided. HOWEVER, if you are ever in this position, it's important that you **redo homework assignments that you didn't learn from**. If you used any external resources (other students, the math resource room, a tutor, or the internet) to complete a homework assignment, then you should try to redo it as soon as possible **by yourself**. Make sure that *you* can do the problems without outside help.
3. If you struggle with a homework assignment, reach out as soon as possible to your professor, other students, the math resource room, supplemental instruction, a tutor, the internet, etc. If the material is going to be on an exam in a few weeks, it's better to get clarification NOW when you're most familiar with the topic. If you choose to complete the assignment without understanding the material, then when you're studying for the exam, you may have to start from scratch to understand it. Math typically has lessons that build on each other. At the first sign of confusion, seek help and clarification because the topic may return later.

***** To summarize, mastering material as you learn it, getting adequate sleep and taking deep breaths to manage exam stress are the best tips I have to offer students who struggle with math classes. At the end of the day, take it one lesson, one question, and one deep breath at a time. *****

Disclaimer: I am a mathematics graduate student who has taken and taught many courses. Everything I say here is based on my own experiences and my experiences with students. Anything I say here should be superseded by information or advice you get from your instructor or experts.

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