

Success in Mathematics

Tips on how to study mathematics, how to approach problem-solving, how to study for and take tests, and when and how to get help.

Math Study Skills

Active Study vs. Passive Study

Be actively involved in managing the learning process, the mathematics and your study time:

- Take responsibility for studying, recognizing what you do and don't know, and knowing how to get your Instructor to help you with what you don't know.
- Attend class every day and take complete notes. Instructors formulate test questions based on material and examples covered in class as well as on those in the text.
- Be an active participant in the classroom. Get ahead in the book; try to work some of the problems before they are covered in class. Anticipate what the Instructor's next step will be.
- Ask questions in class! There are usually other students wanting to know the answers to the same questions.
- Go to office hours and ask questions. The Instructor will be pleased to see that you are interested, and you will be actively helping yourself.
- Good study habits throughout the semester make it easier to study for tests.

Studying Math is Different from Studying Other Subjects

- Math is learned by doing problems. Do the homework. The problems help you learn the formulas and techniques you do need to know, as well as improve your problem-solving prowess.
- A word of warning: Each class builds on the previous ones, all semester long. You must keep up with the Instructor: attend class, read the text and do homework every day. Falling a day behind puts you at a disadvantage. Falling a week behind puts you in deep trouble.
- A word of encouragement: Each class builds on the previous ones, all semester long. You're always reviewing previous material as you do new material. Many of the ideas hang together. Identifying and learning the key concepts means you don't have to memorize as much.

College Math is Different from High School Math

A College math class meets less often and covers material at about twice the pace that a High School course does. You are expected to absorb new material much more quickly. Tests are probably spaced farther apart and so cover more material than before. The Instructor may not even check your homework.

- Take responsibility for keeping up with the homework. Make sure you find out how to do it.
- You probably need to spend more time studying per week - you do more of the learning outside of class than in High School.
- Tests may seem harder just because they cover more material.

Study Time - You may know a rule of thumb about math (and other) classes: at least 2 hours of study time per class hour. But this may not be enough!

- Take as much time as you need to do all the homework and to get complete understanding of the material.
- Form a study group. Meet once or twice a week (also use the phone). Go over problems you've had trouble with. Either someone else in the group will help you, or you will discover you're all stuck on the same problems. Then it's time to get help from your Instructor.
- The more challenging the material, the more time you should spend on it.

Problem Solving - Problem Solving (Homework and Tests)

The higher the math class, the more types of problems: in earlier classes, problems often required just one step to find a solution. Increasingly, you will tackle problems which require several steps to solve them. Break these problems down into smaller pieces and solve each piece - divide and conquer!

Studying for a Math Test: Everyday Study is a Big Part of Test Preparation

- Do the homework when it is assigned. You can't cram 3 wks. of work/ learning into a couple of days.
- On tests you have to solve problems; homework problems are the only way to get practice. As you do homework, make lists of formulas and techniques to use later when you study for tests.
- Ask your Instructor questions as they arise; don't wait until the day or two before a test. The questions you ask right before a test should be to clear up minor details.

Studying for a Test

Start by going over each section, reviewing your notes and checking that you can still do the homework problems (actually work the problems again). Use the worked examples in the text and notes - cover up the solutions and work the problems yourself. Check your work against the solutions given.

You're not ready yet! In the book each problem appears at the end of the section in which you learned how to do that problem; on a test the problems from different sections are all together.

- Step back and ask yourself what kind of problems you have learned how to solve, what techniques of solution you have learned, and how to tell which techniques go with which problems.
- Try to explain out loud, in your own words, how each solution strategy is used (e.g. how to solve a quadratic equation). If you get confused during a test, you can mentally return to your verbal "capsule instructions". Check your verbal explanations with a friend during a study session (it's more fun than talking to yourself!).
- Put yourself in a test-like situation: work problems from review sections at the end of chapters, and work old tests if you can find some. It's important to keep working problems the whole time you're studying.
- Start studying early. Several days to a week before the test (longer for the final), begin to allot time in your schedule to reviewing for the test.
- Get lots of sleep the night before the test. Math tests are easier when you are mentally sharp.

Taking a Math Test - Test-Taking Strategy Matters

Just as it is important to think about how you spend your study time (in addition to actually doing the studying), it is important to think about what strategies you will use when you take a test (in addition to actually doing the problems on the test). Good test-taking strategies can make a big difference to your grade!

1. First look over the entire test. You'll get a sense of its length. Try to identify those problems you definitely know how to do right away, and those you expect to have to think about.
2. Do the problems in the order that suits you! Start with the problems that you know for sure you can do. This builds confidence and means you don't miss any sure points just because you run out of time. Then try the problems you think you can figure out; then finally try the ones you are least sure about.
3. Time is of the essence - work as quickly and continuously as you can while still writing legibly and showing all your work. If you get stuck on a problem, move on to another one - you can come back later.
4. Work by the clock. On a 50 minute, 100 point test, you have about 5 minutes for a 10 point question. Starting with the easy questions will probably put you ahead of the clock. When you work on a harder problem, spend the allotted time (e.g., 5 minutes) on that question, and if you have not almost finished it, go on to another problem. Do not spend 20 minutes on a problem which will yield few or no points when there are other problems still to try.
5. Show all your work: make it as easy as possible for the Instructor to see how much you do know. Try to write a well-reasoned solution. If your answer is incorrect, the Instructor will assign partial credit based on the work you show.
6. Never waste time erasing! Just draw a line through the work you want ignored and move on. Not only does erasing waste precious time, but you may discover later that you erased something useful (and/or maybe worth partial credit if you cannot complete the problem). You are (usually) not required to fit your answer in the space provided - you can put your answer on another sheet to avoid needing to erase.
7. In a multiple-step problem outline the steps before actually working the problem.
8. Don't give up on a several-part problem just because you can't do the first part. Attempt the other part(s) - if the actual solution depends on the first part, at least explain how you would do it.
9. Make sure you read the questions carefully, and do all parts of each problem.
10. Verify your answers - does each answer make sense given the context of the problem?
11. If you finish early, check every problem (that means rework everything from scratch).