

## MATH STUDY SKILLS

The tips in these handouts are based on my past experience, suggestions given by students, and tips given by the math department of Saint Louis University.

### Studying Math is Different from Studying Other Subjects:

1. Math is learned by **doing** problems. Do all the homework.
2. Each class builds on the previous ones. 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.
3. The rule of thumb for study time for math classes: at least two hours of study time per hour of class time. More time may be needed when covering difficult topics.
4. College math requires that more learning occur outside class than high school math. Tests may seem harder in college because they cover more material.

### Homework Suggestions:

1. Do the homework when it is assigned.
2. When you work problems on homework, write out complete solutions, as if you were taking a test. Don't just scratch out a few lines and check the answer in the back of the book.
3. Check your answer in the back of the text. If your answer is not right, rework the problem; don't just do some mental gymnastics to convince yourself that you could get the correct answer.
4. Mark the numbers of the problems on the top of your homework paper that you are unable to finish completely. Then get help on those problems by asking in class or seeking help individually from your instructor, a tutor, or a classmate. Be sure to ask the questions as they arise; don't wait until the day or two before a test.
5. Place a star next to difficult problems on the homework. Then, near the exam date, spend extra time reviewing starred problems.
6. Keep an ongoing list of formulas and techniques to use later when you study for tests.

### Seeking Help:

1. Make use of the resources on campus for help: classroom question and answer time, instructor's office hours, the math lab, free tutoring in the Tutor Center in the library building, and videos on sections from the text on reserve in the library.
2. Asking any question is better than no question at all. But a good question will be the most effective.
  - Not too helpful comment: "I don't understand this section." The best you can expect in reply to such a remark is a brief review of the section, and this will likely overlook the particular thing(s) which you don't understand.
  - Good comment: "I don't understand the difference between  $y = f(-x)$  and  $y = -f(x)$ ." This is a very specific remark that will get a very specific response.
  - Good question: "How do you determine the graph of an exponential function such as  $y = 5^x$ ?"
  - Okay question: "How do you do #17?"
  - Better question: "Can you show me how to set up #17?" (The instructor/tutor can let you try to finish the problem on your own.) OR "This is how I tried to do #17. What went wrong?" The focus of attention is on your thought process.
3. When you go to office hours, the math lab, or a tutor, have a specific list of questions prepared in advance. **You** should run the session as much as possible.
4. Right after you get help with a problem, work another similar problem by yourself.

## **Studying Before an Exam:**

1. **Don't cram.** Start studying early. Several days to a week before the test (longer for the final), begin to allot time in your schedule to review for the test.
2. Start by going over each section, reviewing your notes, quizzes, warm-ups, and homework. You should actually **work** problems again. You can use each previously worked problem/example by covering the solution and working the problem yourself. Then check your work against the solution.
3. Study your list of formulas and techniques regularly throughout the semester.
4. Try to explain out loud, in your own words, how each solution strategy is used (i.e. how to solve a quadratic equation). If you get confused during a test, you can mentally return to your verbal "summaries".
5. Since the exam covers many sections, it is important to review in a way that forces you to jump from one idea to another. Try to simulate an exam at home with the review assignment by putting a little time pressure on yourself. Mark any problems you needed extra time on and do extra practice problems on those topics.--- Another idea: Write old homework problems on index cards with the section and problem number listed on the back of each card. Then shuffle the cards and try to do the problems in random order.

## **Right Before an Exam:**

1. Get a full night's sleep and eat breakfast/lunch.
2. Take a walk, run or something that reduces your stress level.
3. Make sure you are prepared with a calculator, pencil, and homework due.
4. Do one or two problems right before class so your mind is in the math mode and you are warmed up for the exam.
5. Visualize yourself doing well on the exam.

## **During the Exam:**

1. Write any memorized formulas down on the test as soon as you get the exam.
2. 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.
3. Start with the problems that you are certain you can do. This will build confidence as well as ensure that you do not miss any sure points just because you ran out of time.
4. Work by the clock. On a 50 minute exam, 100 point test, you have about 5 minutes for a 10 point question. Starting with easy questions will probably put you ahead of the clock. When you work on a harder problem, spend the allotted time (i.e. 5 minutes) on that question, and if you're not almost finished, go on to another problem. You can revisit the problem at the end if necessary.
5. Read the directions for each problem two times before doing the problem to be sure you know what's being asked.
6. Show all of your work. Make it easy for the instructor to assign partial credit based on what you do know.
7. 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 can put your answer on another sheet if you run out of space.
8. Don't give up on a several-part problem just because you can't do the first part. Attempt the other parts. If the actual solution depends on the first part, at least explain how you would do it.
9. When finished, skim the exam to be sure you answered everything. If you have time, check your answers.
10. If you're nervous, stop and take a deep breath. Then look for an easy problem to do first/next.
11. Stop negative thoughts: "If I can't do this problem, I'll fail the test. If I fail the test, I may fail the class. If I fail the class, I won't be able to transfer and then I'll never reach my career goals." No math test is worth this much negative thought. As soon as these ideas begin, stop them, take a big breath, then find an easy problem to get back in the math mode.