Mathematics

Guidelines for study

Reading and In-Class Lectures

First read the textbook section before class to get the feel of the material about to be covered in class and develop questions about specific areas that you do not understand.

Read a second time to understand the material. If there is some part you do not understand the first time you read it, look back at the preceding material in the section and see the logical steps the authors are talking to get that point. If it is still outside your grasp, then ask the professor (or a tutor) about it.

Take notes on topics that are important or those you didn't understand when you read the material.

Mathematical lectures are not made for you to take dictation of every word the professor says. Lectures deal with subtle concepts, their logical structure, and problem solving techniques. After a lecture, ask yourself what concepts you learned and how they fit together to form a structure.

Take notes in class on particularly important points of the lecture, giving note to theorems, example problems, formulas, important graphs, textual references, and main points of the talk.

ASK QUESTIONS!!!

If there is anything about a particular concept or problem that you do not understand, ask your professor about it. Not only do questions give you specific answers to your problems, they also give others in the class the opportunity to reflect about the material that is being covered. Surprisingly, many of the students will have the same questions as you but won't ask them. Your questions will help more people than just yourself.

ASK MORE QUESTIONS!!!

Full understanding requires more than just blind faith of mathematical concepts. Ask deeper questions and move to the next level of thought in the mathematical argument. Great mathematicians thought this way, and you can too!

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Re-read material covered, and process that with your notes.

- Always process the material being covered after class, especially while preparing for the next class session. Math builds on itself, so reviewing the previous section will undoubtedly help in understanding the next section. Ask yourself whether there is a logical connection between sections. If the professor solves a problem, try to repeat it. Then ask, "Can I solve it in another way?" If not, then why is the professor's way the only way to solve the problem?

Homework

- Develop a series of questions that you can ask yourself in order to solve the problem. This does two things: it breaks the problem down into smaller, more manageable parts, and it identifies the little quirks of harder problems.
- Smaller questions aid greatly on problems that you don't understand right off the bat and help you think, "I can do this!" rather than "Wow, this problem is huge."

When you aren't sure how to solve a problem, think out a solution by:

- Estimating: make the problem a little simpler by rounding and see about where the answer should lie.
- Guess and Check: guess a few answers and get a good estimate as to where the problem is going. This can also reveal a pattern that will help in solving your problem. You'd be surprised just how often this particular process works.

Analysis

- If you take a step back and think logically about the answer, sometimes it can be derived without using a formula or any mathematics at all. HOWEVER, you still have to figure out the mathematics behind the answer. This also gives a pattern that you can use to solve the problem.

Graphing

- Pictures, charts, or graphs help you see the immense possibilities of mathematics. Drawing the problem out is also a wonderful starting point, as it describes the motion of a variety of functions. Charts and pictures show patterns and possibly even answers! This works especially well for visual learners.

Working Backwards

- If you "know the answer" but just can't get there, try working backwards from the answer and show that you can get back to the problem itself. Then use those steps to get back to the answer.

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When problems look HUGE, break them down into smaller steps

- Large problems require smaller steps to solve them. Don't get overwhelmed by problems with a lot of small steps; just keep going with what you know. You'll be surprised at what you can solve!

If you are still stuck, ASK QUESTIONS!

- Ask about the exact step in the problem that you do not understand. If you ask about that specific step, the professor, tutor, or friend will be able to help you more effectively than if you just say, "I don't get this problem." You just might even be able to figure it out using notes and the text.
- The step that you are missing may be the critical step in most, if not all, of your homework problems. The earlier you find out the correct way to solve the problem, the easier it will be to complete homework successfully.

Take Breaks

- If you cannot "get" a certain problem, leave it for a while and come back to it later. You might be surprised to find that you can understand it when you come back to it.
- If you get frustrated with math itself, leave it for a while, study something else, and come back to it later. Math was not meant to be done all in one sitting.

Use your resources! Ask your professor questions, stop by the AAC Math Drop-in Lab, or make an appointment with a peer tutor in Academic Assistance!