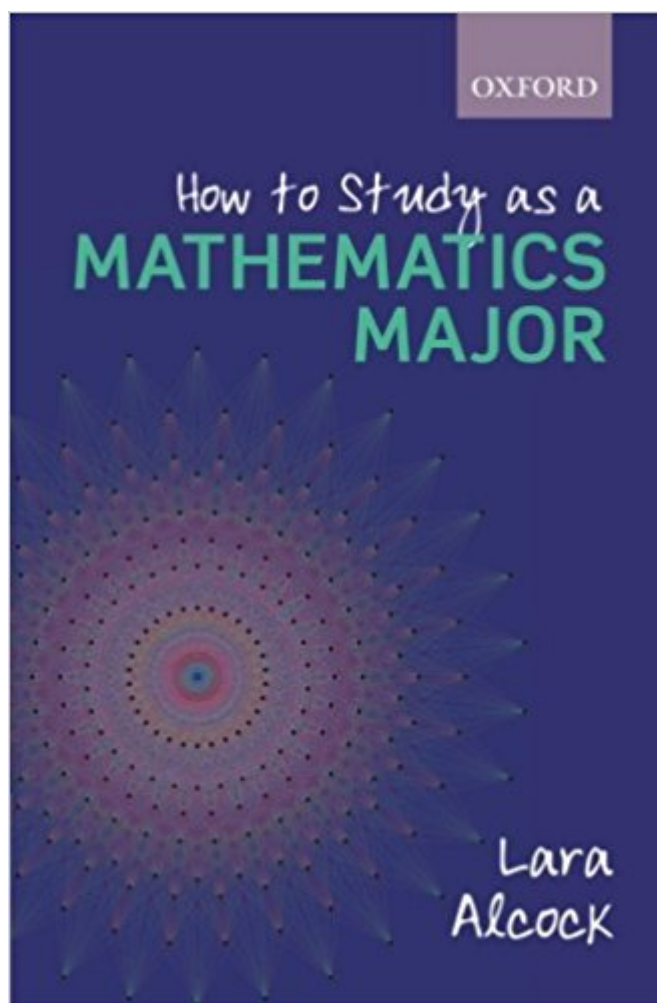


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# How To Study As A Mathematics Major



## Synopsis

Every year, thousands of students declare mathematics as their major. Many are extremely intelligent and hardworking. However, even the best will encounter challenges, because upper-level mathematics involves not only independent study and learning from lectures, but also a fundamental shift from calculation to proof. This shift is demanding but it need not be mysterious -- research has revealed many insights into the mathematical thinking required, and this book translates these into practical advice for a student audience. It covers every aspect of studying as a mathematics major, from tackling abstract intellectual challenges to interacting with professors and making good use of study time. Part 1 discusses the nature of upper-level mathematics, and explains how students can adapt and extend their existing skills in order to develop good understanding. Part 2 covers study skills as these relate to mathematics, and suggests practical approaches to learning effectively while enjoying undergraduate life. As the first mathematics-specific study guide, this friendly, practical text is essential reading for any mathematics major.

## Book Information

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## Customer Reviews

"Students can benefit from just 'picking it up' for a short time - now and then - and reading just about any section. The sections are relatively short - sometimes just two or three pages, but are very informative. One could easily recommend [How to Study as a Mathematics Major] to undergraduates." --Mathematical Association of America

Lara Alcock is Senior Lecturer in the Mathematics Education Centre at Loughborough University, UK. An accomplished undergraduate and graduate mathematician at Warwick, her doctorate was in mathematics education before holding various academic posts including Assistant Professor of Mathematics Education and Mathematics at Rutgers University, New Jersey. Her research focuses on the challenges students encounter as they make the transition from calculation-based to proof-based mathematics. She was awarded the 2012 MAA Seldon Prize for Research in Undergraduate Mathematics Education. She has been awarded National Teaching Fellows of 2015 by The Higher Education Academy.

I liked it very much! She focuses on the root of the difficulties to major in mathematics. This book is really suitable for students who can see or at least be warned about the notable difference between high school and university; so he or she can find tips and good advices to help them to overcome misconceptions and erratic procedures learned during former studies. For teachers it is also suitable because they can feel somehow what skills students still might need, and comprehend why they show failures on test or troubles acquiring abstract concepts; this way teachers can adapt or improve their plans whether they can in order to give their students a good initiation.

Though I am graduate student in Mathematics, the skills and methods to study mathematics that were discussed in this book have been of tremendous help to me. I will recommend this book for graduate students in Mathematics who after their first degree spent sometime in the industry or teaching high mathematics. It will give you a good start for graduate school.

This is a great book for someone just starting their university studies. The way the book is written gives you the feeling that a good friend is giving you some valuable advice. Highly recommended.

Excellent book on studying and mathematical thinking. Highly recommended for STEM majors and anyone interested in mathematics. This book would have made a major improvement to my mathematics, physics and engineering courses.

I found the book not only informative, but insightful. The author obviously knows her stuff! For me, Mathematics was my minor as an undergrad. But the information is still just as relevant. The book differentiates between a student's way of thinking for "lower level" mathematics, and "higher level" abstract and analysis courses. It makes perfect sense! (At least it did to me.) Included are many tips

and techniques that I personally think should be taught as a standard "gateway" course for any higher level math classes. I highly recommend this for anyone either taking, or considering to take, a 300 level or above college math course!

Upon looking at the title "How to Study as a Mathematics Major," I thought it was going to be based on students' experiences as a mathematics major, how they studied, and which books were useful for them per area. Also, I wanted to know how those who survived the gauntlet did it. Alas, it's nothing like what I thought in the book. Instead, the author cherry-picks simple, very basic examples to illustrate her points in terms of the right way of approaching mathematics. Boring. For the second part, it's College 101 information: how to improve your study skills, manage your time better, etc. Double f'ing boring. Let's be real by talking about the true way of studying mathematics.

1. Work through a textbook in full by solving every problem. This is the true route of deep understanding.
2. Whenever you solve a problem wrong or don't know how to do it, copy the problem and the solution in a journal of problems. Practice them over and over. I've done this for years and still remember how to solve many esoteric problems in this way whenever they occur; it's a nice skill to have.
3. Always do more than the minimum. For example, a teacher for a class might cover 10 problems out of 30 per section. Do yourself a favor: always solve all of the 30 problems. Then, you won't be complaining of gaps in your knowledge when you go higher in math.
4. Purchase a subscription through Chegg and look at the solutions. It's a goldmine of information; these detailed, worked-out solutions teach so much that you'll never get in a regular mathematics lecture in all four years of your undergraduate mathematics education.
5. Google "solutions manuals for sale" and look for the ones for your textbooks. Whatever they cost, buy them; they will arrive in PDF file through your e-mail. This method will save you a lot of time and headaches. The true value of learning the content is to work through the problems and looking at the solutions to make sure that what you are doing is correct; otherwise, copy down the problem and solution and practice it over and over. You'll get better. Those who cheat just merely copy the solutions and do nothing about it. There is a big difference. You can try looking for the free ones online, but they are pretty hard to find; then, if you have to download the file, it might come with a virus. So, be careful.
6. If the textbook sucks, fine. Go to [Amazon](#) and look for alternate books that are more pedagogically sound and reach the points in a clear, straightforward manner. Math becomes much easier this way. Better yet, go to your university's library and look through all of the books in the math section; you'll be surprised at what you find, and nobody ever visits there.
7. A lot of students are too dependent on just one book that's mandated by the teacher for the class; don't fall into that trap. Find other books to supplement your learning. The

more books you work with, the better your chances are of passing the class and moving on.<sup>8</sup> Always check through the ratings of the professors for the classes you might register for. Most of the time, these reviews are quite accurate. If a professor has bad reviews, just stay away from his classes and never look back; don't even consider trying. (Note: there are legions of AWFUL math professors in the business and many cannot teach worth a spit). I am telling you, a lot of your money is being spent per class; don't waste it on a class with a bad professor that will force you to delay your graduation. Plus, keeping your overall GPA intact is quite important in the long run, especially when it comes to getting into a graduate school.<sup>9</sup> Beware of schools with a very small mathematics department. I say this because, if you are really dead set on majoring in math and there are a grand total of like 4 to 8 professors and they all stink, the solution is to transfer out and go to a much bigger university. It happened to me once, and I transferred out. The professors I had were all replaced many years later.<sup>10</sup> I do not recommend working during the year. Save that for the summer. Math is too hard, and you'll need as much time as possible.<sup>11</sup> Find out in advance what books your professors will use in class. Study them 2 to 4 months ahead of the classes plus supplementary books. Master the first 2 to 4 chapters, and you will be way ahead of your classmates; all left to do is to plug in the holes during the semester. Trust me, you'll be cruising through and wasting less time struggling through the content.<sup>12</sup> Go to YouTube and search for good lessons on what you are learning at the moment. There are many good ones and can easily replace your instructor's lectures.<sup>13</sup> I recommend studying for at least 6 hours a day. My norm is 10 to 12 hours a day. Math is too fun; time sure flies fast. If that's not the case for you, then math isn't for you at all. On the other hand, if you have done everything possible and the information isn't getting through your head, do not worry. It happens to a lot of people, and they just can't help it because it has a lot to do with IQ. So, I recommend you to switch to another major and save your money and time. Honestly, I don't think majoring in math is worth the time or effort; try a major that is more practical as long as it's marketable and you have other skills, i.e. programming languages, etc. I will say that if you struggle too much through the first 3 calculus courses, you can just forget about it because it's not going to be easy from thereon; just move on and find another major. If you survived calculus, differential equations, statistics, linear algebra, and the likes, you can finish off your major; you are almost there, but it's going to be a pain once you hit real analysis (ultimately the final hurdle of your undergraduate math education). All in all, How to Study as a Mathematics Major is a joke.

Decent book. I found the advice too general to be of much use. It is perhaps MOST useful to a

freshman entering college who wants to get an idea of what to expect, but this book does not actually contain many study strategies for mathematics beyond the most general advice. If you're looking for a list of things to do to get A's and impress your professors, pass this book. If you just want a decent primer of what to expect and what will be expected of you, along with some encouragement, then do get it.

A great overview of what your math major entails, from changing the way you think about math to making the most of your time in college.

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