How to be good at mathematics

What do you gain by learning mathematics?

Anyone who has done music, dance or a sport to an advanced level has already gained some of the skills that are necessary for, and developed by learning mathematics. These are important life skills - tenacity, perseverance, commitment, mental toughness, ability to deal with frustration, ability to deal with stress and perform under pressure, to mention just a few. So rather than saying to yourself “Why do I have to learn this, I’ll never use it”, how about saying “Maybe I don’t see the relevance of this right now, but I know I will gain a lot by the struggle to get it right”.

Remember, it’s the journey that’s important, not the destination. The answer to a problem is much less important than the way you go about solving it. You gain little from knowing the answer, but you learn lots from the process of solving the problem. This means you have to do it yourself, even if it takes several days.

We all know the way to get good at something is to practise, try really hard and don’t give up. Mathematics is no different.

Classes

Attend everything, turn up on time, stay for the whole duration, concentrate, listen and take notes, ask questions - and turn your phone off.

You are at university, not school, and there is simply not the time to repeat things over and over until everyone in the class understands. Things will be explained only once, this is why we take notes. It’s not like reality TV or lightweight documentaries, where the (very few) main facts are repeated throughout the show until the audience can’t forget them!

Mostly your mathematics lecturers don’t hand out lecture notes, you should take notes yourself. While you may find this difficult at first, it doesn’t take long to get good at it - and it keeps you awake!

Assignments, projects and quizzes

What is the worth of the assignments? Is it the marks, or is it what you learn by working through the problems? Is it really worthwhile to copy someone else’s work or use a solution you found online just so you can hand it in on time? Do you really think you can do a good job if you start work the day the assignment is due? If you asked your friends for their solutions or found most of the information online, did you actually learn anything?

Tutorial exercises

Is there any point downloading the barcoded tutorial exercises just so you can get your attendance recorded? Think about why your lecturers want you to turn up, think about why they want you to attempt the exercises before going to the class. Remember that your lecturers were students once, in fact they were successful students, so they know a bit about effective study habits and really are trying to help you succeed.

How much study and what to do

NO FACEBOOK! Turn your phone off, go away from your computer – you can’t study anything if you are fiddling around on Facebook, Twitter etc, or texting your friends.

Put your iPod away – you won’t have music in the final exam, so get used to working without it.

Put your calculator away – most of the time you don’t need it, use your own brain instead.

Work on one subject at a time. Do your maths first while your mind is fresh, and don’t interrupt yourself with incursions into your computing assignment or your physics notes.

Your lecturers will not give you specific homework like you had at school. You must work out what to do each day. It is not enough to simply do only the compulsory work. Here are some hints:
• read your lecture notes very soon after your lecture
• work through the examples again, without looking at the notes
• read the online notes past where the lectures are up to (so you have read some material in advance of the lectures)
• work through the questions at the end of each chapter
• if there is a recommended text, read that too and do the exercises.
• don’t download umpteen You-Tube videos in the hope that you’ll find the magic bullet – the time is better spent in working it out yourself from the resources provided, and only get help if you really are stuck.

• **Start work early** on your assignments, projects etc. Assignments and projects are not intended to be something you can knock over in one sitting. They require careful thought, applying what’s been done in lectures (so read your notes carefully), and your mind needs time to work on the problems subconsciously. Much research has been done on how the mind solves problems when you are not actually thinking about them, so it is essential that you give yourself several days. Otherwise you cannot produce your best work.

• **Start work early** on the online quizzes, if your unit has them. Computers and internet connections know when you are running late, and will conspire to make you miss the deadline!

• The University recommends three hours per credit point per week, including class time. This means if you have four units, you have the equivalent of a full time job, so you can expect to be studying 7 or 8 hours a day in total. For mathematics you may need to exceed the recommended 9 hours, as there are at least 5 hours of classes each week, and it will take you at least an hour a day to read over your notes, do some exercises and complete the compulsory work.

• Get your sleep at a sensible time. There is no point staying up all night studying, you will be in no condition to concentrate on lectures the next day.

**Study plan**

Make a weekly timetable for study that includes time for all your units, and allows extra time when assignments are due or tests are coming up. Paste this up on your wall at home, and keep a version in your phone. Put reminders for all your due dates into the calendar system on your computer and phone.

**Getting help – when and how**

Starting work early, having attended all your classes and read your lectures notes, is the best help you can get. You should persevere with trying to understand by reading, repeating the examples, filling in gaps in the working, trying similar problems.

It is really helpful to discuss the lecture material and tutorial exercises with others in the unit, you will all learn a lot and can have some fun. Make a regular time to meet each week, this will help you develop a good support network, and maybe even some lifelong friends!

When you get stuck (properly stuck, not just giving up without a decent fight) the Numeracy Centre can help, so can your lecturers and tutors. Don’t be afraid to ask questions, but please don’t leave it too late!

There is a wealth on mathematics online, including notes, videos of people doing problems, online help sites, automated problem solvers etc. These can be really useful, but beware - watching other people do it, reading about it, having it done for you is nowhere near as valuable as struggling to do it yourself. Whilst it might seem as if these resources are making it easy, this is not entirely the case. You can only learn mathematics by **DOING**, not by being a spectator – you must do it yourself and do it often. You can spend hours trawling the web for “helpful” sites, when that time would be much better spent developing your own ways to think, trying to understand the theory, learning to value the struggle, getting on top of your feelings of frustration.

If you have fought hard to solve a problem yourself, maybe for several days, there is nothing more rewarding than the feeling you get when the pennies drop and you realise you can do it! A solution gained in this way will be one you remember, unlike the one you could have found on the web which you will forget as soon as you’ve written it down.