

ENJOYING MATH!

*Some hints and tips for students enrolling in
Trent's first-year mathematics courses*

Mathematics, like writing, depends upon a vocabulary, a structure (or grammar), and practice. It would be an impossible task to write a letter if you had to look up every word in the dictionary, and if you knew no grammar. It is equally impossible to do mathematics without having the basic formulas at your fingertips, as second nature, or without understanding the rules – that is, the grammar – for manipulating those formulas. Just as writing becomes easier with practice, and more enjoyable as you are able to express your thoughts more exactly, so does math become easier and more enjoyable as you gain the understanding and the confidence that spring from practice.

So, while the formal timetable may look quite light when compared with the experimental sciences because there are no labs, and while mathematics courses do not ask for the essays expected in the humanities programs, nevertheless you would be very wrong to suppose that they involve lighter loads. That is, if you want to do well in them, or even to pass them. It is not sufficient just to attend the lectures and tutorials, and to read your lecture notes and your text book – you must **DO** mathematics. As part of this, you should check your lecture notes soon after the class to ensure that you understand, and to reinforce what was taught. You should also work on all the exercises assigned in lectures, even if you are not required to submit them. It is only in this way that you can be sure that you grasp the material well enough to be able to use it. If you have difficulties, you should ask at the next tutorial – because if you do not understand and cannot use one week's lectures, you will not understand those of the following week. And things go quickly from bad to worse to disaster!

But with practice and understanding comes confidence, and with confidence comes an appreciation of the beauty of mathematics.

So, the most important tip of all is

KEEP UP!

In order to keep up

DO PROBLEMS AND ASK QUESTIONS

How much should you memorize? This is to a large extent a personal decision. The elementary rules of algebra, the basic laws of geometry and trigonometry, and the laws for manipulating exponents and logarithms are essential and should be second nature if you are enrolling in MA 110 or MA 130. People vary in how much they wish to remember, but if you like to rely on your memory for formulas, bear in mind that there are more mathematical formulas than anyone can retain, so that sooner or later you will be forced to replace memorization of formulas or of steps in proofs by an understanding of methods.

BE SURE YOU UNDERSTAND

In the words of the University of Toronto's *Mathematics Survival Guide*

Understanding grows with time and experience. Do not expect to follow the mathematics completely, right away; you will have to think about it, and it may not be until later work is covered that you can appreciate the full significance of earlier material.

BE TENACIOUS – WORRY IT THROUGH

At university, students are responsible for their progress, for their course material. The faculty members will help, will answer questions, will look for an explanation that satisfies you, but

REMEMBER – YOU ARE RESPONSIBLE

And, finally, never try to pass university math exams by cramming the day (and night) before: it just does not work. All you can do at the last minute is find out how much you do not know. That is no confidence builder!

WORK STEADILY THROUGHOUT THE YEAR

A NOTE ON THE LIBRARY

Mathematics books are found under the call letters QA in the library. Books that might interest you are:

Precalculus, M.A. Munem and J.P. Yizze, QA29.2 .M84
What is Calculus about?, W.W. Sawyer, QA303 .S28
Elements of Linear Algebra, A.J. Pettofrezzo, QA251 .P46
An Elementary Introduction to the Theory of Probability,
B.V. Gnedenko and A.Y. Khinchin, QA273 .G5713
A Path to Modern Mathematics, W.W. Sawyer, QA11 .S14
What is Mathematics?, R. Courant and H. Robbins, QA37 .C675
How to Solve It, G. Polya, QA11 .P6

WRITING EXAMS

The following tips appear in the University of Toronto's *Mathematics Survival Guide*, and are reproduced here because they state succinctly the key points.

In first-year mathematics courses, a good portion of your final grade will be based on formal written examinations. Following are some suggestions for maximizing your score:

1. Keep current. It is next to impossible to cram for a mathematics exam.
2. Arrive at an examination well-rested. If you stayed up the all of the previous night studying, you probably will not perform as well as you are able.
3. When you obtain the examination, read through it *carefully*.
4. Make a note of the questions you are sure you can do and do them (although the easier questions often appear in the first part of an examination, this may not be true for an individual student).
5. If the calculations for a question become unreasonable, check for errors. A question worth 5% should not require 10 pages of calculations.
6. Try to work neatly. Messy work often leads to errors.
7. Try to apportion the time you spend on a question relative to its worth. It is not a good strategy to spend 50% of the time available on a question worth 10% of the final grade.
8. If you have the time, check your work.

GROOK

Problems

Problems worthy
of attack
prove their worth
by hitting back.

Piet Hein