mathNEWS

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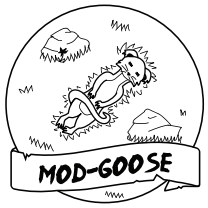
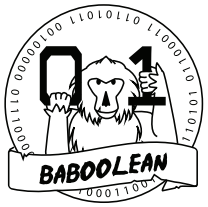
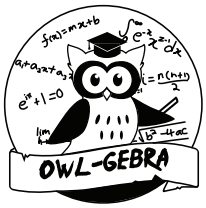
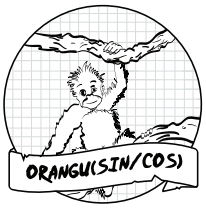
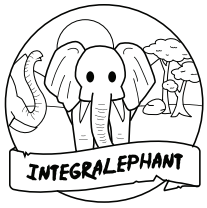
ORIENTATION ISSUE 2019

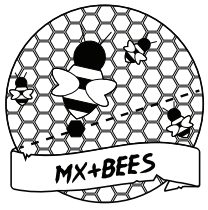












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mastHEAD

"WHAT DO YOU WISH YOU'D KNOWN IN FIRST YEAR?"

Hello and welcome to you, first-year Math student!

This is **mathNEWS**, the University of Waterloo's bastion of erudite thought, and official newspaper of the Faculty of Mathematics. We've been running since 1973 and publish a new issue every two weeks, usually 6 issues a term.

An issue of **mathNEWS** is made of a lot of different parts. After the cover is what we call the **mastHEAD**, composed of a blog-style article written by the editors (a.k.a. the one you're reading right now) and a question and answer section with our writers. This issue's question is "What do you wish you'd known in first year?", wherein the **mathNEWS** writers and editors give advice they wish they had when they were wee little padawans like you.

The bulk of the issue is formed from the many articles and pieces of artwork we get from the **mathNEWS** community. This **mathNEWS** Special Editon™ focuses on articles from faculty clubs and other informative articles from our writers. There is still some of the classic **mathNEWS** spirit, which is to say utter chaos. We've got low-effort articles that are derivatives of others, inside jokes, surrealist comedy, and some arguably tasteless jokes that will definitely get me a stern talking to. We've even got a Jojo reference. Not in this issue are poems, articles written by profs, **profQUOTES**, research papers, terrible puns, and passive-aggressive complaints about profs and courses.

At the end of the issue we have our crossword puzzle the **gridWORD**, which is occasionally joined by another puzzle called the **haltingPROBLEM**. On the back there is the **lookAHEAD**, a two week calendar of upcoming events that mathies might be interested in. The publication date of the next **mathNEWS** issue is the highlight, of course.

That about wraps it up. We hope you enjoy this issue, and don't just shred it for your hamster's bedding. Best of luck with your new university career, and try to resist the urge to read **mathNEWS** instead of going to class. I know it's tempting. If you want to read more, you can pick up back issues on the newstands outside the **mathNEWS** office in MC 3030.

Have a great Orientation Week!

confusED
Editor, **mathNEWS**

Sandwich Expert	Start your assignments earlier than you think you need to.
Xavientois	If I write for **mathNEWS**, I get free pizza. (The MathSoc fee basically pays for itself.)
Cix	Have a good umbrella and at least one pair of waterproof shoes. Waterloo can be pretty rainy!
Finchey	Sometimes things don't go as you thought they would and you just gotta let your pride take a beating and make a fool of yourself. It's alright because everyone else is also making fools of themselves: you just aren't there to see it all the time.
Epsilon Screwn	CnD has awesome garlic bread on Fridays.
dawdling	If you have trouble concentrating in more comfortable places, there's probably an open classroom nearby you can hijack.
swindlED	Everyone's just as awkward and unsure of themselves as you. They're also just as desperate to make new friends.
unsophisticatED	Things work themselves out in the end. There are going to be tough times, times when you fail, times when you struggle. It's easy to get bogged down by the setbacks of the past. If you focus your gaze on the horizon and make the most of the present, opportunity will present itself.

SELF-PORTRAIT **BY CIX**

Welcome to Waterloo Math!

JAMIE ANDERSON, mathNEWS EDITOR FOR FALL 2019
ALONG WITH TERRY CHEN AND JOSH RAMPERSAD

MATH FOC SEZ

Thank you for coming to Orientation! We (the MathFOC) and the Waterloo Orientation team have worked really hard to make this week awesome for you! We hope you enjoy the activities, learn something new about the university and admire the plentiful (and loving) geese. Most of all, we hope that you will make a ton of friends and build a network that will last Beyond™ your time at university. You'll see us floating around during the week in red vests – if you see us, come say hi!

Welcome to Math!

Judy, Alex L, Alex R, Hyla
2019 Math Federation Orientation Committee

P.S. Check Portal for a schedule of Orientation events!

MENTAL HEALTH SERVICES

Greetings, mathies! This is a gentle reminder that many resources exist for students with mental health concerns. There are a number of math students at Waterloo with mental illness, so you are not alone. If you have a mental health concern, or suspect that you may, please do not hesitate to get in touch with medical professionals such as:

- Health Services (519-888-4096)
- Counselling Services (519-888-4567 ext. 32655)
- Needles Hall Addition, NH 2401
- Good2Talk (1-866-925-5454)

You can also speak to a first-year advisor for academic and administrative advice, or register with AccessAbility Services for academic accomodations (519-888-4567 ext. 35082, NH 1401).

If you would like more information on how you can contribute to mental health reforms within the faculty, feel free to contact the Vice President Academic (vpa@mathsoc.uwaterloo.ca) or the Associate Dean, Undergraduate Studies, Benoit Charbonneau (math.ug.ad@uwaterloo.ca).

swindlED
Editor, **mathNEWS**

MATH ENDOWMENT FUND SEZ

Hello Mathies!

On behalf of the Math Endowment Fund Board of Directors, welcome to the University of Waterloo Faculty of Mathematics!

WHAT'S THE MATH ENDOWMENT FUND?

The Math Endowment Fund (or MEF for short) is an $8 million fund that seeks to finance projects and support clubs that benefit undergraduate math students. Fun fact: Math Orientation is sponsored by MEF!

THIS MEF THING SOUNDS PRETTY COOL! CAN I HELP?

Well, eager first-year student - have you ever wanted to allocate over $150,000 in funding? Well you're in luck - that's exactly what you can do as a member of the MEF Funding Council! Run as a first-year undergraduate representative - there are 3 seats available. You can also represent your program by running for program rep - there's 2 seats available per program. For more details, check out uwaterloo.ca/math-endowment-fund/funding-council.

BUT I DON'T HAVE ANY EXPERIENCE WITH ACCOUNTING, FINANCE, OR ANY FIELD OF BUSINESS. IS THIS RIGHT FOR ME?

If you like listening to pitches and granting funding, you'll definitely enjoy being a part of Funding Council. It's also a good idea to join if you want to improve your pitching skills by listening to other pitches. Being a member of funding council is a low-commitment position - you only attend about two short evening meetings. Did I mention free food?

If you have any questions, feel free to ask! Send an email to mefcom@uwaterloo.ca, like us on Facebook (facebook.com/MathEndowmentFund/) or check out our website (mef.uwaterloo.ca).

Have a great first term!

MEF

Want to write for mathNEWS? Come to the next production night! New writers are always welcome!

A mathNEWS EDITOR WHO NEEDS NEW FRIENDS

MATHSOC SEZ

Hello first-year Mathies!

Welcome to the Faculty of Mathematics! The Mathematics Society (or MathSoc, for short) is the student-government for the undergraduate math student body at the University of Waterloo. Given that you are a math student, you are already a member! The MathSoc office is located on the third floor of Mathematics & Computer Building (MC 3038).

WHAT CAN MATHSOC DO FOR YOU?

Here's a small snippet of what MathSoc provides to you:

- Awesome math T-shirts, sweatpants, ties and more
- Inexpensive printing and photocopying
- Free candy!
- Textbook library when you don't feel like spending all of your grocery money on textbooks
- Events like Pi Day (when you get to pie the MathSoc execs), Coffee House, Board Game nights, Party with Profs, résumé critiques, and more!

HOW CAN I GET INVOLVED WITH MATHSOC?

Do you want a mentor to help you transition from high school to university? If so, sign up to be a mentee of the MathSoc mentorship program!

Are you into student government? Want to have your voice heard and make decisions that would have an impact on all math students? If so, represent your fellow first-year students as a first-year class rep!

If you're not into student government, don't worry because we have tons of other volunteer opportunities for you!

- Want to join a large team that keeps the MathSoc office open and make some great lifelong friends? Sign up to be an Office Worker.
- Want to manage hundreds of previous exam files on the MathSoc website? Volunteer as an Exam Bank Director.
- Want to gain some real-world accounting experience that will help you land that dream accounting/finance job of yours? Apply for a Finance Director.
- Have great communication skills and a passion for graphic designs? Become a Marketing Director.
- Want to run some cool events? Be an Events Director.

You can find applications for all of these positions (and more) at mathsoc.uwaterloo.ca!

WANT TO CONTACT US?

President (president@mathsoc.uwaterloo.ca) - Reach out for:

- Questions regarding MathSoc clubs and external organizations, or about MathSoc itself

Vice President Academic (vpa@mathsoc.uwaterloo.ca)

- Academic and co-op-related questions, concerns, and feedback
- Suggestions for exam bank, textbook library, and academic events

Vice President Operations (vpo@mathsoc.uwaterloo.ca)

- Questions and feedback regarding the MathSoc office and the services we provide

Vice President Finance (vpf@mathsoc.uwaterloo.ca)

- Questions about refunds, cheque reimbursements and club budgets

Vice President Internal (vpi@mathsoc.uwaterloo.ca)

- Questions and feedback regarding MathSoc events
- Marketing requests (i.e., poster approval)

Keep your eyes peeled to your UWaterloo email, **mathNEWS** and the MathSoc Facebook page (facebook.com/mathsoc/) for more details on all of these opportunities, including application deadlines.

If you have any questions, send an email to info@mathsoc.uwaterloo.ca, or message us on Facebook!

Have a great term!

Tiana Zhao (VPA)
MathSoc Exec, Spring 2019

Solely to provoke an argument, I will say that I don't believe in infinite sets — they are merely convenient fictions.

PROF. DAVID WAGNER

WUSA SEZ

Welcome to UWaterloo from your Waterloo Undergraduate Student Association (WUSA)!

WUSA (formerly known as Federation of Students) represents the collective voice of UWaterloo undergrads. We're not the University: we're a not-for-profit student advocacy organization that is funded and run by Waterloo undergrads.

As an undergrad, you're automatically a member of WUSA!

WHAT DOES WUSA DO FOR YOU?

Want to start a club, make change on campus, or improve your educational experience? We're here to help you make it happen!

ADVOCACY

We represent your voice on issues like tuition and financial aid (OSAP), mental health, housing, co-op, campus safety, and transit (to name a few) to the decision makers at the University and all levels of government.

STUDENT LIFE

All societies, including MathSoc, are a part of WUSA, which supports over 200 clubs as well as 13 student-run services like the Glow Centre, MATES, Sustainable Campus Initiative, and Campus Response Team.

We also facilitate special events like Orientation, Wellness Days, and Welcome Week, which runs from September 9 to 13.

STUDENT GOVERNMENT

You elect your student representatives on Societies, Students' Council, Board of Directors, and WUSA Executive. Any Waterloo undergrad can run for a position on the Executive, Board, or Council.

GET INVOLVED WITH WUSA!

Volunteer with a student-run service, run for a position in student government, or apply to one of our many on-campus part-time jobs – make the most of your time at Waterloo with your student association!

WUSA

A FIRST YEAR'S GUIDE TO MC

Welcome, newbies! Now, being new students you no doubt find the MC to be a large, terrifying behemoth of a fortress from which no soul can ever escape. That doesn't go away. But I'm here to make you lost slightly less often when you're wandering these desolate corridors.

First of all, in each corner of each floor is an extremely useful map of the floor (just like in every building on campus), with room numbers and little pictures. If you're looking for a class or professor's office, these maps are key. (For the purposes of this article, West is defined to be the side closest to the SLC.) Every floor has women's washrooms in the Northeast and Southwest corners, and men's washrooms in the Northwest and Southeast. So you don't have to walk down more than one side of the building to find a bathroom.

First floor: You might have a class on the South side of this floor. There are exits at each corner of the building (and on the south side) halfway between the first and second floors. Graham, the university's supercomputer, is located on this floor.

Second floor: You will probably have a few classes here, mostly on the North and South side. There are a couple of computer labs here, if you're in need of a computer lab.

Third floor: This is really the heart of the MC. You have the Comfy Lounge (where there's a Loop table!) and the C&D on the South side, most of the club offices on the East side, more labs in the middle and West side, and the MFCF over near Northeast. If you have problems with your Waterloo accounts or other computery problems, you can see them. It's also the home of MathSoc (MC 3038). You should swing by if you get the chance; they offer a lot to math students (including free candy!!!)

Fourth floor: There are a lot of classes here, as well as some important offices. The Math Undergrad Office, which you'll need to get course override forms and all kinds of administrative things, is on the North side. The Math Orientation Office is also on this floor.

Fifth floor: There are are a couple of prof offices on this floor, as well as a lot of graduate student offices. The Dean of Math office is also on this floor, on the Southwest side. Starting on this floor, the bathrooms start being a lot cleaner, too.

Sixth floor: Once an endless labyrinth of twisting corridors, the sixth floor has been renovated and is occupied by mostly professor offices. The South side has the CEMC, which is the department that helps schools in Ontario and all over the world to teach math and computers. Really great people.

Seventh floor: IT DOES EXIST! I'VE SEEN IT! IT— [The rest of this article has been withheld by the University Censorship Board, which does not in any way confirm the existence of a seventh floor of the Mathematics and Computer building.]

Prometheus

MY FIRST YEAR EXPERIENCE: CHAPTER 1.

ORIENTATION, HEARTBREAK, AND A NON-EMPTY SET OF FRIENDS

As I moved into my room in V1, I was greeted by a sign on my door. George Kennepotbunk it read. Of course, my real name is George Kennebunkport. I guess spell check was too much for my don. As my family helped me move in, I was off to SLC to get my orientation goody bag. It came with a key chain, math orientation sticker, and a condom, which lies a few meters away from me in my medicine cabinet as I write this. It's still unused, of course. After meeting up with a few friends from high school who are at Waterloo as well, I call it an early night to prepare for orientation activities the next day. Of course, I sleep in a bit, and am late to the first event. I manage to catch my group just as they are leaving. We get to the headquarters for our team in MC. I sit next to some random guy, trying to start a conversation and make a new friend, but Jesus Christ, could he be more boring to talk to? This is not the kind of person I want to hang around with. Finally we go off to our first activity, saving me from the awkward "conversation" I was stuck in. Maybe I'll have more success talking to girls, I think to myself. On average, I've found girls to be less awkward than guys. That's how I made my first friend at university: Alex. She's pretty cool, speaks three languages, and was rejected from CS too. At lunch that day Alex introduced me to her friends Carol and Azalea. Carol is a calm and quiet girl, and Azalea appeared to be as well. I later found out that Azalea was just toning her inner self down. She's actually super badass, breaks all kinds of laws, and is way too kinky — even for a city boy like me.

The first day of orientation was lots of fun, but the night was harder. You see, I had broken up with my girlfriend Penelope just a week before starting school here because neither of us wanted to do long distance. We knew from that start that it would eventually happen, but it was still hard. I missed her and I was still thinking about her often. I decided that I would keep myself as busy as possible for the first few weeks. As they say, time heals all wounds. I've learned that that saying is mostly true. Sometimes there are scars, but eventually you turn out okay.

The next day I tried really hard not to be late to orientation, and ended up being a bit early. Morning activities were pretty so-so. At lunch I met a new friend: Thomas. Thomas is the gayest and most flamboyant person to ever prance about this green earth. Truly a delightful person to meet that my religious family would not approve of in the slightest. That afternoon, the info session for that advanced math sections was held, which I had enrolled myself in. I make very poor decisions, you see. In line I met a bouncy girl with glittering golden hair named Whild. At the info session I sat next to Wanda, who was very relaxed.

The professors seemed like their goal was to scare us. But hey, I did AP in high school, how hard could these "advanced" courses really be? Of course, as I would later learn, the answer to that is: the hardest thing you've ever done in your whole life. I say that as someone who used to teach grade two students game programming in Microsoft Visual Basic. "Where is the Q key?" they would ask, "It's literally the first key on the keyboard." I would reply. That was a hard job.

With a new set of friends, and a non-empty set at that, I was ready to start university classes. And boy oh boy, was I not ready in the slightest.

The moral of the story? Orientation is what you make of it. If you want to be a bummer and complain, you won't have a good time. If you stop taking yourself so seriously and learn the math dance by heart, you will have a fantastic time.

George Kennebunkport

YOUR GUIDE TO THE MATH C&D

The Math Coffee and Donut Shop (or Math C&D/CnD, for short) is a tiny little shop on the third floor of Mathematics and Computer (MC) building (it's the big old grey building that you'll learn to love). Despite its relatively small appearance, the C&D is actually a million-dollar organization run by MathSoc! The C&D sells some of the cheapest food on campus, including coffee & donuts (duh), bagels, muffins, and other assorted baked goods. There's also a wide variety of pre-packaged sandwiches and meals (veggie and halal options are available!), sushi, as well as a rotating selection of soups and hot food. A small snippet of the hot food available:

- Mac & Cheese on Mondays
- Chicken + Vegetable Stew on Wednesday
- Chili on Friday

There's also garlic breadsticks on Friday (that sell out extremely quickly - *especially* when I'm on campus)!

You'll also hear people referring to the seating area connected to the Coffee and Donut Shop as the C&D - there are microwaves available to heat up your food, as well as plenty of seating (complete with power outlets) so you'll be able to eat and study at the same time! It's also a popular place to meet with friends to work or study together. There's board games nights hosted by MathSoc every Thursday night as well!

The C&D doesn't accept meal plan dollars (or any payment by Watcard) - but they do accept cash, debit and credit!

Hope to see all of you around at the C&D!

Axel

MATHEMATICAL FICTION FOR THE NEW FRAA OR SUUR

Welcome to math at Waterloo! You may realize while you're here that you can't get enough of mathematics, and your courses just aren't cutting it. If you're ready for it, I highly suggest you dive in to reading papers, but if you're looking for something a bit "lighter" I have compiled a list of good fiction in no particular order.

The Wild Numbers, A Novel by Philibert Schogt. The Wild Numbers is a made-up problem for the novel, but the work describes fairly well what would happen if a mathematical nobody managed to prove Fermat's Last Theorem, or one of the other greats. As it happens, truth is stranger than fiction, and we have had a few of these examples pop out of the woodwork. Still good for inspiration.

Surreal Numbers by Donald E. Knuth. A novella by Knuth about two students trapped on a desert island, who go on to recreate all of mathematics. A fun read to understand why the underpinnings of math are the way they are. Available for free on archive.org.

Math Girls by Hiroshi Yuki. This is a novel that was adapted from a manga and has been translated from Japanese. It deals with three high school students who like math and their teacher who helps encourage them. The math content is mostly combinatorics and it is an excellent supplement when taking MATH 239 or 249. There is also a sequel about Fermat's Last Theorem.

Logicomix by Apostolos Doxiadis et al. A semi-historical biographical graphic novel about Bertrand Russel and the search for truth in mathematics. It uses some characters in an anachronistic way, but they are meant to represent letters and opinions of contemporaries in the mathematical community, even though they may not have actually met. Very light on mathematical content, it can be shown to lay persons with no issue. Also by the same author is Uncle Petros and Goldbach's Conjecture, which covers a lot of modern mathematical history.

Flatland: A Romance of Many Dimensions by Edwin A. Abbott. A satirical novella about class and society in Victorian Britain, endured moreso because of its examination of the concept of dimension and the ability to relate it to lay people. There is also an animated film inspired by it, and a non-authorized sequel called Flatterland, written 100 years later and dealing with non-Euclidean geometries.

Anathem by Neal Stephenson. The inspiration for the title of this article, Anathem deals with math monks and mathematical philosophy, as well as multiverses and quantum mechanics, from a couple of different perspectives. There is not much pure mathematical content, but it is an enjoyable romp with people whose thought processes you can understand. Also by Neal Stephenson is Cryptonomicon, a novel about codebreaking in World War II and more modern cryptography.

The Difference Engine by William Gibson and Bruce Sterling. One of the progenitors of the steampunk genre, The Difference Engine imagines a world in which Charles Babbage's Difference Engine was built in the early 1800s, and deals with an imperial world with computing and information technology. Interesting in the notions of social ramifications of technology.

NUMB3RS created by Nicolas Falacci and Cheryl Heuton is a TV show about an FBI agent who uses a mathematician to help him solve crimes. The math presented in the show was verified by mathematicians, although there were some concerns as to how it was used, considering that at times it seemed only tangentially related to the plot. There is also a blog about the math behind NUMB3RS. It is six seasons long, so this might be one to take a bit at a time.

Alice's Adventures in Wonderland and **Through the Looking Glass** by Lewis Carroll. The fantasy work by Carroll, a pseudonym for an Anglican Deacon and logician, is inundated with logical wordplay and puzzles, surely to amuse the budding math student.

Gödel, Escher, Bach: An Eternal Golden Braid by Douglas Hofstadter. The penultimate work on symmetry in human thought and creation, it examines three people over time and considers how they are similar and different.

Ice Nine

THE MASCOTS

You may have already had encounters with the faculty mascots (including our beloved Pinkie the Tie <3) and King Warrior, the university mascot. Now I love the mascots and all, but they kinda look out of place, you know? With all the geese that are on campus, I think it's time for us to respect our true overlords and change the mascots to something that truly represents us. Here's what I'm proposing:

- Math: a goose wearing a pink tie
- Science: a goose wearing a lab coat and safety goggles
- Arts: a goose wearing sunglasses
- AHS: a goose holding a Frisbee
- Environment: a goose wearing a "banandana"
- Engineering: 4 geese wearing hard hats with 2 of them chained to the tool
- Main mascot: a big goose (mother goose) holding a sword and wearing a helmet

(Don't understand any of these references? Read this article again once orientation week's over!)

honk

MY FIRST YEAR EXPERIENCE: CHAPTER 2.

DADDY JAO

It was my first day of lectures. We had received an email from David Jao earlier in the week, sent at 4:02am.

> *Hi,*
>
> *I'm David Jao, your instructor for MATH 145 - Section 001. I'm very excited to get this class started — you are all in for a special experience.*
>
> *First things first: If you look at your schedule, MATH 145 has a tutorial on Fridays at 1:30pm in STC 0060. If you are in my section (Section 001 - which you should be),* **THIS TUTORIAL WILL BE USED ON THE FIRST DAY**. *That is, you are expected to attend the tutorial hour on Friday, September 7 at 1:30pm in STC 0060, in addition to the lecture hour on Friday, September 7 at 2:30pm (also in STC 0060).*
>
> *Other math classes at Waterloo do not start their tutorials until the second week of classes. MATH 145, as you will quickly discover, is like no other math class. [...]*
>
> *Some of the first few assignments in this class require you to install and use the Coq proof assistant. [...]*
>
> *We have a fabulous classroom, one of the best in the entire university. Every seat has its own power outlet so you can keep your computer powered on all class.*
>
> *I want every single student to succeed in this class. Please do not hesitate to contact me anytime, by any means if you have questions.*
>
> -David

Wow. Sent at 4:02am, "special experience," and "like no other math class." What the hell did I get myself into? And Coq? I think I've heard of that. Is it what I think it is? It is. Dear god, what did I get myself into?

The first lecture was teaching us Coq, a programming language for programming math proofs. There were so many people in that first lecture that some people had trouble finding seats! We had an assignment on Coq as well that we were given that week. We had to prove things like -a * -b = a * b, something I never thought even needed to be proven. We had to come up with our own axioms for the integers, which was quite an incredible experience. I personally liked this axiom I came up with: $\forall\ a \in \mathbb{Z},\ a < a + 1$.

Now, it turns out that proving -a * -b = a * b is hard. So I asked a girl I went to high school with, Mars, who was in 145 with me if she wanted to meet up and work on the assignment. She brought her friend Whild, who I had briefly met at orientation. We managed to get through that assignment while trying to avoid any Policy 71 issues. Those issues went away though after Jao said on Piazza that we are allowed to work together on assignments (as long as the groups aren't too big), and so the three of us started working together a lot more.

Throughout the term, a few more people joined us. For assignment 2, we were joined by Chrysanthemum, who is one of friendliest and chillest people I have met at university. We (re)discovered the continued fraction expansion of *e*, which remains as my favourite math fact ever. It turns out that *e*, a transcendental number, can be written as an infinite nested fraction whose terms are from a simple predictable sequence.

Once I went to a TA's office hours where I met someone in the class who asked us if we were part of the class group chat. This group chat is of course the famous Daddy Jao chat, which as far as I know is how David "Daddy" Jao got his nickname.

Later in the term we met Claire and Sasuke who joined us working on the assignments together. Having friends in the course really helped making succeeding in it possible.

One of the best parts of MATH 145 was the timing of Jao's office hours. He held office hours twice a week at the perfect time to fill awkward gaps in my schedule, so I attended religiously. In fact, some people proposed worshipping David "Daddy" Jao as an idol. Jao had a special ability to answer your questions without answering them. He would give you just enough to get you unstuck, without ruining the fun of the problem or the learning from doing it. He also gave out great life advice and had no issue answering math questions completely unrelated to the course topic. Once I asked him about p-adic numbers and since there was nobody else in office hours that day, he essentially gave me a lecture on what p-adic numbers are, which was fantastic. I learned that p-adic numbers are beautiful and I can't wait to study them more in future years.

The most memorable day of MATH 145 was the day before the final. I rushed through my PSYCH 101 final to make it to office hours, which for some reason had been moved to some room in DC instead of being in MC as usual. When I arrived there, I realized why.

Jao moved his office hours during the exam to a secret room in DC that contains magical amenities such as a rock climbing wall! We studied in that room for a while. At one point, someone, we assume a graduate student, stopped by, told us he was a friend of Jao, and offered us help studying for the final. It was really a wonderful experience.

The moral of the story? Jao is wonderful, go to your prof's office hours even if you don't have questions about the course, and if your prof allows it, work with friends. It can really enhance your learning.

George Kennebunkport

SMOKING HOT CO-OP ADVICE

Since the co-op process can be pretty intimidating and unintuitive for newcomers, I'll outline some tips for blazing your way to success on your first co-op. The CEE (official co-op people) will explain the process and requirements to you in the semester before your first co-op term, but these are a few extra tips and tricks for taking your game from so-so to flaming hot.

GETTING THE INTERVIEW

- It's all about the résumé, although on a side note, making sure you have a positive social media presence can help for some jobs as well.
- If you're having trouble writing your résumé, start by describing all of your work and volunteer/extra-curricular experience in the last 4–6 years, then reduce that down to simply the most recent and/ or relevant positions. The final copy of your résumé should be 1–2 pages total.
- If you have personal side projects related to your field, definitely include them! For example, dropping a link to your GitHub account or a personal website is a great way to stand out if you're applying to programming or web development jobs.
- Don't underestimate the value of soft skills like communication or teamwork. Even if they're completely unrelated to your major, you can use activities like playing in a band, being part of a club, or writing for **mathNEWS** *cough* shameless plug *cough* to show your leadership/ teamwork/ communication/other skills.
- Get someone to proofread your résumé. Seriously, I cannot emphasize this enough. Ask a knowledge-able friend or head to a résumé critiquing session on campus—find more than one person who will give you honest and detailed feedback on the quality of your résumé. Like a good essay, résumés usually need several revisions before they are presentable.

PASSING THE INTERVIEW

- So you got an interview—congratulations! You've made it past the first step, so give yourself a pat on the back and then put on your war paint.
- Research the company before doing the interview. You should be able to clearly and concisely state what the company does if they ask (which some occasionally will).
- Make a list of your key strengths that you can market in that particular interview. Look for opportunities to tout these strengths as the interview progresses.
- There are some stock questions that come up frequently in interviews. Ex. "Tell me about yourself.", "What are some of your weaknesses?", "Why do you think you fit this job?", "Why do you want to work here?". Thinking about your answer to some of these questions before the interview will help you avoid foot-in-mouth scenarios.
- Prepare a list of 3-5 questions to ask at the end of the interview. The employer may have already answered some of these questions during the interview, so having more than 3 means you can have back-ups. Make sure to include questions about things that will help you choose which job you want (work environment, pay, location, etc.) as well as ones that show interest in the position (job duties, typical work day, etc.)
- Find some good business wear, and arrive at least 10 minutes before the interview. Some interviews may start early, and if not then the extra time gives you time to breathe and calm down.
- Just relax. No seriously, just relax and be natural. You've already made it this far, you're prepared for this,

In the end, the interview process is a bit weird. You'll have some interviews that you thought you bombed only to find out you got an offer (that's how I got my first co-op job), some interviews that you were sure you rocked for which you are never ranked, and some interviews that go exactly as you expect. All you can really do at the end of the day is try your best and not take the results too personally. If you're having trouble, CEE offers lots of resources to help spruce up your job prospects and there are lots of other students and upper-years around campus who have tons of great advice. Best wishes!

BlueberryMuffin

FEED ME!

It has come to my attention that I am hungry. I'm usually stuffed full of Mathie goodness, but I was abandoned for most of the month of August.

You can feed me most anything; I'm not very picky. Some of my favourite foods include: **gridWORD** solutions, **profQUOTES**, articles, comics, and money. Especially money.

Please send all food to me care of my top slot. I can be found between the Comfy Lounge and the Math C&D. And you can feed me online too! I can't use the Internet myself, but if you email the nice people at mathnews@gmail.com they'll feed me at no cost to you! Please don't send food as attachments though; just stick it into the body of the e-mail and it'll be scrumptious.

The **mathNEWS BLACK BOX**

"WHAT DO YOU MEAN IT'S BAD TASTE TO WRITE RECRUITMENT ADS FOR THE ORIENTATION ISSUE OF mathNEWS?"

I DO WHAT I WANT AND I ANSWER TO ABSOLUTELY NO ONE, NOT EVEN THE mathNEWS EDITORS

Hello, dear readers. You, mere fledgling first-years freshly beginning on your post-secondary journeys: how it takes me back! To last year, in fact. Yes, only twelve months ago was I as full of baby-faced wonder and young naïveté as you are right now. Now I've become a jaded, senile crock that gets CS 136 midterm flashbacks in the middle of the night, but preaching to the children makes me feel young again. That's why I decided to write something for this very *special* issue of **mathNEWS** you hold in your hands right now.

I wanted to write a lot more articles, for all the juiciest insider tidbits I learned over the course of eight months at UW. Like where the best washrooms are located and which restaurants within a 30-min walk of campus that have the most value for your money are the least likely to give you salmonellosis. But alas, the editors gave me four days notice that they were taking new articles for the orientation issue and I only had the time this week to bust out one. So I had to focus on what I wanted to tell you younglings the most, and as it turns out, I decided I wanted to tell all of you to try out writing for **mathNEWS**. Yes, that's right! You!

Nobody really knows what **mathNEWS** is. If one thing's for sure, though, it's that it's definitely not a newspaper (God forbid I hear *any* of you infants say that whenever I pass you by in the halls). It's part amateur comedy zine, part anonymous blog, part platform for earnest student expression, and part long-form shitpost. All written, edited, and run by Math students, *for* Math students. Doesn't that just set fire to the social anarchist inside us all? In terms of other student publications, there's Imprint and there's Iron Warrior (which is much better than Imprint but only relevant to you if you're in SE), but **mathNEWS** is simply in a class of its own. Nothing in the world is quite like it.

I'm hoping that this issue gives you a good taste of what **mathNEWS** is like and leaves you interested for more. My own orientation issue from last year is what first got me hooked onto **mathNEWS**. I'll let you know that we have every single issue from as far back as 1998 or some shit is posted on mathnews.uwaterloo.ca, so if you're a real go-getter you can check it all out over there. Or you can peruse a lovely, colourful assortment of recent issues outside the **mathNEWS** office on the third floor of MC if paper's more your thing.

If you get any enjoyment at all from reading **mathNEWS**, I assure you that you'll have six times as much fun writing for it. Like, come on, you get to write about whatever the hell you want and have your words immortalized in the **mathNEWS** archives til the end of time, and make up a cool pseudonym for yourself, ask profs all your burning questions for the **mathASKS** column, answer the **mastHEAD** with your wittiest one-liners, and so much more to boot. Even if you think writing's not your thing, if you come to production night and barf out an N-things listicle over the course of two and a half hours, you'll still get free pizza at the end of the night. Free pizza! You heard me right. We get the good shit too. Come by to a production night one day and you'll see what I mean. **mathNEWS** people are pretty nice to hang around with too — even the editors! Somehow their dictatorial power hasn't gone all to their heads (yet).

I guess if you don't like free pizza (or you can't make it to a production night but still want to send in stuff), you can always submit stuff to the editors via mathnews@gmail.com.

In conclusion: write for **mathNEWS**. There's free food. You meet people and make friends. Your writing gets published. You're building and taking part in the student community. It's fun.

See you soon,

Finchey

P.S: A treat for you if you've read this far: my favorite cheap restaurant is Pub on King in Uptown (everything on the menu is $6! I recommend the fish and chips or chicken burger), and the second-best washrooms on campus are the ones up on the fifth floor of STC. The first-place bathrooms will remain my little secret.

N PLACES TO DUMP ALL YOUR MEAL PLAN MONEY INTO

- CMH Caf (BOOSTER JUICE!!!!)
- Tim Horton's at SLC, but only when there isn't a line that goes up the stairs
- Subway in SLC
- Not the Math CnD (they don't accept Watcard!)
- Starbucks, but only when there's a line stretching all the way to the doors of STC
- Tim Horton's at SCH
- Liquid Assets in HH (a hidden gem with really good soups)
- The **mathNEWS** editors
- V1 spicy chicken wraps

honk

MY FIRST YEAR EXPERIENCE: CHAPTER 3.

THANKS, KEN

It was time for my first ever math lecture! MATH 147 with Dr. Kenneth Davidson, where on the first day, he gave us axioms for the reals. We also had an assignment already and Orientation Week wasn't even over! He said that if you can't handle the first assignment, you should drop the course. Well, I couldn't handle the first assignment, so I went to our TA's office hours.

The next lecture consisted of some theorems, a proof for each, and a few examples. The lecture after was the same. And so was the lecture after that. Apparently university math classes are just theorem, proof, example, repeat. Kind of repetitive, but all of the math professors seem to have their own unique style of humour to keep things interesting.

The midterm was coming up. I never needed to study for tests in high school, but I heard university is harder. Guess I'll study a little bit. When it came time to write the midterm, I opened up the paper. I couldn't solve the first problem. No biggie, let's go to the second. Nope. Third? Nope. Fourth? Not a chance. Fifth? *Sigh.* Sixth? Why am I like this. Seventh? WHAT THE HELL, THERE ARE ONLY SIX PROBLEMS! Guess I'm going back to the start. Is this how limits work? I dunno. What is this limit? e^π seems as good a guess as any. I thought I had passed, and I definitely passed if he dropped the denominator, which he had done on all of the assignments. Was I ever wrong. One morning I get out of the shower, and my phone lit up. Email from Crowdmark. My midterm had been marked. 43%. I'm scared. What now? I went to the 147 lecture that day, and Ken starts by writing the midterm mark distribution on the board. He puts a line through it. "If you're mark is below this line, and you're not planning to drop to 137 already, you should really talk to me first."

Well you see, I'm a stubborn person. If you tell me not to do something, I will do it. My high school physics teacher once told me not to do the topic I wanted to do because it was too hard. He got a 60-page research paper to read through from my group.

I went up to our professor after class and said, "Professor, my mark was below that line but I don't want to drop this course," and so we set up a meeting for later that day in his office. My friends Mars and Whild went with me and waited out in the hall for me. That was by far the most terrifying experience I have had. Meeting with a professor because you messed up the midterm so hard? That shit is scary, but it ended up not being too bad. Ken turned out to be really nice and understanding. After discussing why I don't want to drop, and looking at what I messed up on the midterm (everything) he told me I could stay, but I'd have to work hard. So I did. I asked him for a book recommendation on proofs and started reading through it whenever I had some time. That book really helped. It's called "Reading, Writing, and Proving" and Waterloo students can download it for free (when connected to eduroam) at link.springer.com/book/10.1007%2F978-1-4419-9479-0. Definitely recommend to anyone struggling with proofs.

I studied my butt off for that course after that. I read through that book until I was comfortable with proofs, I went to my TA's office hours almost every week (I swear that I would not have passed the course without that TA), and during exam time, I locked myself in my room and studied for a week straight. No breaks. When I ate breakfast and dinner I would be reading notes. I managed to pull a 79% on the final (before the curve) and finished the course with an 85% (after the curve).

The moral of the story? Don't let yourself get down because of a few bad marks. Even if you get one mark so godawful the professor tells you to consider dropping the course, if you work hard, you can still do well.

George Kennebunkport

N THINGS YOU SHOULD KNOW ABOUT YOUR WATCARD

WALDO ENJOYS USING IT A LITTLE TOO MUCH.

- It is a bus pass for the Grand River Transit. Simply tap it on the card reader and you can ride to wherever you need to get to! It also works with the Ion light rail - just tap it on the card reader!
- It is linked to your meal plan and flex dollar accounts, letting you just tap to pay for things.
- If lost, immediately report it to the Watcard office or use http://watcard.uwaterloo.ca/ to deactivate it to ensure that none of the money is used by someone else.
- It costs $30 to replace so do your best to not lose it!
- You will need to bring it to EVERY EXAMINATION that you write. Don't forget it!
- It can be used at a lot of places on and off campus, including: restaurants (like Tim Hortons, Subway, East Side Mario's and the residence cafeterias), some stores (like those found in the University Plaza), the libraries (for things like printing, photo-copying, and signing out books), the laundry machines in residence, International News in the SLC (on-campus convenience store), Waterloo Taxi (519-888-7777) and many more! For a complete list of where WatCard is accepted, visit http://watcard.uwaterloo.ca/.
- It is used as collateral for resources provided by certain services, like signing out games from MathSoc or booking a room from the Turnkey desk.

waldo@<3.LE-GASP.ca

THE 3RD FLOOR OF MC

THE SOCIAL HEART OF THE UWATERLOO MATHEMATICS COMMUNITY

Welcome to the University of Waterloo and to the Math Faculty! You've begun your journey towards an undergraduate math degree along with over a thousand other math students, and you'll probably meet a number of them in your classes and residence life. What a lot of new math students don't realize is that there is a large social community of which to be a part, and that there are many benefits to doing so. Let's have a look at some of the ways you can participate in the math community, most of which are located on the 3rd floor of the Math and Computer building, your new home:

MathSoc: The Mathematics Student Society runs many events during the year, and has many opportunities for volunteering and meeting other students. Many of the office workers are upper-year students, and all of them are willing to give you tips and help you feel at home. Some of the ways in which you can volunteer are to help staff the office, organize and run events like the our many Pi Days (we have three of them, one for each term!), and be a student representative on MathSoc Council. You can find the MathSoc office right across from the C&D (MC 3038)!

Program Clubs: Almost every program in the Math Faculty has an associated club, which runs events geared towards their members' general interests and an office where you can meet like-minded students in a social setting. For example, the Pure Math, Applied Math, and Combinatorics and Optimization Club (the programs are small!) runs prof talks and math contests, and the Computer Science Club has Code Parties and Unix Tutorials. Club members tend to take courses together, so there are likely to be students with whom you can work together. Note that you don't have to be in the program to join the club! Watch for the MathSoc Clubs Day early in the first month of classes. Finally, note that a large number of Stats- and ActSci-related clubs are actually located in the Mathematics 3 (M3) building. They're further away, but we still love them!

Orientation: Depending on when you're reading this, you're most likely either currently in or have finished participating in Orientation Week. If you feel so inclined, next year you can switch roles, and be a leader of new students! In a leader role in Math Orientation, you have the opportunity to be a guide and role model for new students, and have a lot of fun along the way, meeting and working with the many other leaders; it's fulfilling and enjoyable to make the week go smoothly, and there are certain things that you only really experience as a leader. Watch for applications online on leads.uwaterloo.ca in December! They used to be on the 3rd floor but have recently moved to the 4th floor, but check them out anyway (they're cool)!

Math C&D and Comfy Lounge: The two 'main' lounge areas of the MC are the sitting space outside the Math Coffee and Donut shop, and the so-called Comfy Lounge next door. Colloquially called the C&D, the Coffee and Donut shop is a great place to work in small groups with some table space and a power outlet or three, or sit and enjoy chili and a sandwich at lunch with a friend. The food is reasonably priced, and there is some part-time work available on occasion. There is also a balcony available, with some seating space there. The Comfy is where you can relax for a time, study or read in a nice chair, or participate in a MathSoc General Meeting. It is not for sleeping; that's what your room is for. The chairs are indeed comfortable, though, hence the name. As an aside, in the C&D there are microwaves; this is remarkably useful. A wide variety of students use both of these spaces; you're almost guaranteed to run into someone you know, or someone you wouldn't mind meeting.

That's a basic rundown of what you can find on the 3rd floor of MC; there are also labs and assorted study spaces on the floor. Make sure to spend some time exploring and visiting the offices; the people you meet will almost certainly benefit you in your time here.

Good luck!

Scythe Marshall

WEBSITES YOU SHOULD CHECK OUT!

- UWaterloo Daily Bulletin, the local school newsletter, published at 9 AM every weekday morning. Read with a discerning eye, may contain propaganda. http://bulletin.uwaterloo.ca
- MathSoc, the student society of the Math Faculty. You can access a previous exam bank, sign up for free lockers, get involved with the society and find cool upcoming events. mathsoc.uwaterloo.ca
- UWaterloo and Waterloo subreddits, aggregators of stuff happening at the university and the region respectively. http://reddit.com/r/uwaterloo/ & http://reddit.com/r/waterloo/
- UWaterloo Schedule of Classes for Undergraduates, a tool you can use to see what classes are being offered in future terms, how full they are, and who is teaching them. http://adm.uwaterloo.ca/infocour/CIR/SA/under.html
- Waterloo Region Record, the regional newspaper, has adequate local coverage. You can also pick up free copies of the printed version in the SLC. http://therecord.com
- Leads, the online application system for volunteer and paid opportunities around campus. leads.uwaterloo.ca
- The Waterloo Undergraduate Student Association, where you can learn more about your student association. wusa.ca

Ice Nine

BLESSED ARE THE INCONVENIENCES

Two years ago, if you asked anyone who knew how I lived, they would describe me as "lazy." At home I would sit around in front of my computer, doing nothing productive — not studying, not working, not socializing, not doing chores. Anything that I didn't need to do, I didn't do, even if I was perfectly capable of doing it. And I'd agree that I was lazy; I wouldn't do anything if I didn't have an excuse to do it.

Then last September I started living at Columbia Lake Village, the rez of townhouses, with three friends from high school as we entered our first year at Waterloo. None of us ever of our own volition took care of a house before, and suddenly no one was there to cook for us or clean for us or shop for us or drive us, or even nag us to take care of ourselves. Suddenly we had a lot more freedom to make our own choices about how to spend our time.

Columbia Lake Village is often derided for being the "worst" rez: the nearest cafeteria — or, for that matter, any place to buy any food — is REVelation, a fifteen-minute walk; getting to the laundry room, since we're in units of townhouses, takes a minute or two of walking outside; and it's far enough (thirty-minute's walk) from campus that we have our own campus shuttle to loop around every twenty-five minutes. And it's a big space — we get more square footage than any other rez — which makes it harder to clean. And we only have one washroom to share between four people.

What horrid inconveniences. How would someone as lazy as I survive if they had to do everything themselves?

And yet, much to my own surprise, I managed to start living responsibly almost right away.

See, not having food nearby gave me an excuse to cook every day. And a less-accessible laundry room provided an excuse to organize how I dress; the distance to campus was an excuse to finally get any sort of daily exercise; the need for cleaning got me to organize my time to clear out a day a week; and the scarcity of washroom access forced me into a better sleeping schedule so I could use it before any of my roommates were up.

Was it annoying? Sure. The first month or so of figuring everything out was plenty tiring. But after those inconveniences became routine and I got used to handling it week after week, I started to have fun with them, much like how picking up a new hobby is daunting at first but sticking with it leads to excitement.

I started to try out new techniques and combinations while cooking, making more and more complicated dishes faster and faster. Every week I'd try a new way of folding up my clothes and towels and sheets to fit more into just a single laundry basket. (Lifehack for anybody living at CLV this year: pour your detergent into your laundry *before* you carry it outside.) My diet became healthier, my days become more structured, I got enough sleep every night, and I started to prefer having walked for an hour or two in a day. I'd spend two or three hours deep-cleaning the kitchen sometimes if I felt like I didn't get enough exercise. Cooking and cleaning became stress relievers. I lost ten kilograms (I was, and still am, overweight), and I was satisfied with my life like I never had been before.

Inconveniences and our habits for dealing with them are the little things in life. They're mundane, everyday things that we often don't put much mind to until either they pile up or we, ourselves, make the effort to think about them. It's the same with small pleasures, really.

I know that at least one of my former roommates — and also many others — disagrees, but I really enjoyed living at Columbia Lake Village. And there was one moment that I really don't think I'll ever forget.

It was a morning in mid-March. I had just gotten to the community center to wait for the campus shuttle, standing at a slightly awkward angle to keep the gentle, not-quite chilly breeze away from my face. The trees nearby were slowly growing out buds for the spring. And, faintly, I heard the chirps of a bird — the first time in the year.

And for the first time in my life, I stood still and listened to the birdsong as trees swayed gently in a breeze that heralded the beginning of spring.

Hopeless romantic? Sure. Birds were just soliciting fornication? I am, and was, aware. But this was the first time I was able to appreciate something so mundane yet pleasant, and it kept my spirit up during the desperation of the Winter 2019 job hunt.

If not for my attention to the little things, I doubt I would appreciate them. And without inconvenience, I doubt I would have paid attention to the little things.

I liked my time at Columbia Lake Village. Among other things, I am grateful for the inconvenience, for it helped me become better.

dawdling

You shouldn't anthropomorphize computers, they hate that.

PROF. IAN GOLDBERG

MY FIRST YEAR EXPERIENCE: CHAPTER 4.

CO-OP

Eventually 1B came around and it was time to start applying for co-op jobs. I had a lot of programming experience, but I still can't compete with upper-years.

How do you write a résumé? I heard from someone that MathSoc was holding résumé critiques, and so I went. Got my résumé destroyed by an upper year who happened to go to the same high school as me. That was fun. Did a new one, applied to 50 jobs for main round.

On the first day of interview selections, an interview came to me! In the interview I was asked about lambda functions, and thanks to the wonders of CS 135 (praise be to our Racket overlords), I was able to handle the question!

I got 4 more interviews for dev jobs, fairly uneventful interviews. I got some interesting interview questions. One interviewer just asked me about one specific project on my résumé from a year ago in excruciating detail, as if a normal person would remember on the spot what specific data structure was used for the frontend and backend to communicate in some project from over a year ago (I think it was JSON, it was a high-tech project). I was asked how to write a program to calculate the cost of washing windows. TD asked an actual coding question!

Eventually rankings day comes around. 4 no ranks, 1 rank. Very sad. Match day comes around. WaterlooWorks goes down. WaterlooWorks comes back. I am unemployed, very sad. But what is this? An email from WaterlooWorks! I was matched with a job? How? Let me message my advisor because I'm not seeing this on the site. Oh great. It was a mistake. So very sad. Continuous time.

Let's apply to every developer job in my big city hometown. Am I desperate enough for QA? Okay, let's do just one QA. Why is there a job under "Junior" that's asking for a Masters degree? It's a blockchain job! Let's apply just for the hell of it, no way I'm getting it.

Not selected for QA. Oof.

One day, I'm in my CS lecture. "Congratulations! You've been selected for an interview." Oh shit. What's this? How was I selected for the blockchain job. Actually. Was this a mistake? Time to learn what blockchain is I guess. I texted my mom about it, and she sent me an online blockchain course that I did to prepare for the interview, but what really helped was watching the 3Blue1Brown video on Bitcoin.

I walk into the tiny webcam interview room. Is that ...? *No.* I sat down and I hear the interviewer ask me "Do you know this guy?" while pointing at the man next to him. It's my friend from high school; I guess he's on co-op there right now and is helping with the interviews. What. Anyway, the interview goes terribly, but that's not my fault. Skype kept freezing and disconnecting. So terrible. I was very upset about it, and then after the interview finished I went to MC hoping to get some pi day pie, but it was all gone! So sad. That night, I was ranked no offer. Ready to give up, I drafted an email to my old employer asking for a job, but miraculously, I was matched the next morning! How did this happen? Nice though! Time to delete that draft email I had ready to ask for a job at my old workplace.

The moral of the story? Never give up! You can do it!

George Kennebunkport

TAKING A MINOR

One smart thing to do with your degree is stick more words on it. There are two common ways of doing this at UWaterloo—heh, well, maybe three, but this column is far too short to discuss taking a joint. You can do the double major thing, or you can just throw a minor onto your degree. So what kind of minors are there? Well, there are those in math and those not. For mathie minors, you need a bunch of courses, but frequently they just overlap the ones you're taking so it turns out to be like four or five courses, perfect for filling up your math-course requirement without taking all STATs or something foolish. Now, for outside of math minors—perfect for those thinking of becoming teachers who want a non-math "teachable"—these take around ten courses, so plan ahead. It gives some structure to your electives, but they require you to take specific stuff that is only available in certain terms—hey, like why I can't finish my English minor on time. So, in conclusion, think about one, but try to plan early.

Allen MacLeon

NOT SO "STRAIGHT AND NARROW"?

Hey mathies (and anyone else fortunate enough to be reading this awesome publication)! If you are gay, lesbian, bisexual, transsexual, pansexual, queer, questioning, or stray in any other way from the "straight and narrow" path of cisgender heterosexuality, you are not alone! The Glow Centre For Sexual and Gender Diversity, located on campus at the Student Life Centre, room 2102, is a safe space where you can meet similar people and/or seek support. Glow offers discussion groups, social events (including an annual trip to Pride Toronto), awareness campaigns, and other resources. For more information, visit www.wusa.ca/glow or email glow@glow.wusa.ca.

TheUndecided

A HOW-TO GUIDE FOR THE ADVANCED COURSES

AND WHY THEY'RE NOT QUITE AS SCARY AS YOU THINK THEY ARE

Do you remember choosing your courses this past summer, and reading about MATH 145/147 and CS 145? These are the so-called "advanced" level math and computer science classes that you can take in your first term in math at UWaterloo. This is an article intending to clarify the role of the courses, and emphasize why you should consider them.

The advanced math courses are called "advanced" not primarily because of a difference in difficulty level, but because of a difference in approach. The advanced math courses focus on teaching you theory and proofs, as opposed to applications. In the advanced math classes, you will see definitions of mathematical objects and properties, as well as statements and proofs of general mathematical statements. On your assignments, you will be expected to use these results to prove (or decide the truth of) other statements. The focus is on a theoretical understanding of math in the abstract case, as opposed to how to use math to compute things in concrete cases.

Doing assignments in advanced math courses is a lot like solving puzzles. You are given all the pieces of the proof, all the ideas, terms, definitions, and theorems you will need, and you just need to figure out how they fit together to complete the proof. Admittedly, these puzzles will sometimes be significantly more challenging than the similar ones that you would see in the regular honours level courses, but it tends to be the case that if you participate in the course and put effort into it, you'll gain the tools to succeed.

The advanced level computer science course, CS 145, is a faster-paced version of CS 135, where you jump right in to high-level abstraction and algorithms. In much the same way as the math courses, CS 145 does emphasize the theoretical aspect of programming, but it also challenges you to work on how to code effectively and efficiently. This, and the follow-up course CS 146, can be great starting blocks for a successful CS degree and career.

Note that it is indeed true that the advanced courses are not for everyone. Not everyone appreciates or needs to know the theoretical aspects of algebra or calculus or computer science, and that's just fine. However, if you are interested in what the advanced courses are all about, there is no reason you should be wary of trying to take them.

There is theoretically (hah!) no downside to enrolling in the advanced courses—you can drop from the advanced courses to the corresponding regular level course at no penalty, right up until the end of the drop WD period. This is a special policy that is designed to give you the opportunity to succeed. Practically, this is a bit of an issue if you actually do drop down very late in the term, because you will probably have not had the same amount of practice as the students in the regular level course at some of the more computationally heavy portions of the course. Talk to your professor and advisor as soon as possible if you end up contemplating this option.

More information about the advanced courses is available at the information session on the Tuesday of Orientation Week, if you're reading this before it actually happens, and from the first-year advisors and the Pure Math/CS departments. Now that you know a bit more about the advanced courses, and are hopefully intrigued by them, you should learn how to enroll in them! If you didn't have the option to do so earlier, you'll have to talk to the instructors who are teaching the courses and fill out course override forms which you can submit to the Registrar's Office. Procedural information can be found online.

If you are trying to transfer courses, and you haven't yet, try to at least sit in on the lectures of the target class. Keeping up on the material in the advanced courses is highly important, especially early on.

Once you're in an advanced course, be sure to put effort in! They are usually more challenging, if not by design, but they are very rewarding, both epistemologically and grade-wise, since the idea is that if you are in the advanced courses, you'd probably do very well in the regular level courses. This is dependent on the work put in, of course. Note that your class is much smaller than a usual first-year math course, and so it's not only easier to meet others in the class, but establishing relationships with them and with your professor will be much more fruitful, as you can work on problems together or get help. The advanced math community tends to be close and supportive, so you'll never be alone in any struggles you might have.

Best of luck!

Scythe Marshall and TheIdentity

TAKING A MINER

One smart thing you can do with your free time is kidnapping. There are two common ways of taking a miner at UWaterloo—heh, well, maybe three, but this column is far too short for such interpretations. One involves kidnapping, while the other, umm, also involves kidnapping. It's really all about who you kidnap. I am not a big fan of kidnapping the young, so I'm going to recommend you take a grown-up miner. Of these, there are several kinds available for the taking. Uranium miners tend to have radiation issues, so try to keep your distance. Coal miners are typically less biologically dangerous; however, there is the mess issue. Those who work in sepulchres or open-pit mines don't usually get covered with as much murk and mess, so I find them the best after the act of taking a miner, but getting them is awkward. Miners who work in shafts can be taken from their shafts a lot easier than kidnapping open-pit workers. So, in conclusion, kidnap guys who work in clean shafts. Or Shaft.

Davey R. Adams

EXTRACURRICULARS

THEY'RE STILL THINGS!

Now that you're at university, you should be focusing on your studies. You're paying money to be here and learn, of course. However, just because you're in university doesn't mean that you should give up all of your favourite extracurricular activities. It is more than possible to succeed in your studies and still have fun doing non-math-related things. Here are some common ways to continue doing the things you love:

Varsity Sports and Intramurals: If you play a varsity sport, such as hockey or squash, or if you do cheerleading (check the UWaterloo Athletics website for the full list of sports), feel free to try out for the teams! Varsity sports are a great way to continue to train and be competitive in your sport, and athletes can get perks, such as reserved training time and free massages. If you're not that competitive, but you still want to play, there are intramural leagues for many commonly-played games, notably dodgeball, handball, and ball hockey, amongst many others (check online for which leagues are being offered). This is a great way to play the sports you love or to try out new ones! There are also various lessons offered by Campus Recreation, like swimming and dance.

Music: There are many ways to continue making music at Waterloo. The Music Department offers studio and theory/skills courses at a variety of levels, and more importantly, has a handful of ensemble classes for which you can audition, including a jazz band, two sizes/styles of choir, and chamber ensemble groups. These classes are worth .25 course units each, half of a normal course, so it's a neat way to obtain some of your non-math credits. Separate from the Music department is the university's orchestra; if you're talented and play an orchestral instrument, the music is at a high level and is rewarding to master. UWaterloo also has a vibrant A Cappella community comprising of several distinct groups that sing on campus. Other groups include the Concert Band Club, the Warriors Band (our pep band at sporting events), and an informal jazz combo, amongst many others. And if you just want to listen, most concerts take place at the end of each term; come out and take in some great music!

Theatre: The main way to get involved in theatre on campus, outside of Drama courses, is to participate in FASS! Standing for Faculty, Alumni, Staff, and Students, FASS is UWaterloo's musical theatre troupe, and they write and stage their own show every February. Auditions are in early January, so it doesn't take much time at all, and the commitment ranges from a small acting role to a stage/band/tech role to the star of the show! It's a great experience, and can lead you towards other theatre opportunities off-campus, such as at the Kitchener-Waterloo Little Theatre (small theatre), and Theatre on the Edge (improv comedy). The Engineering Students Society usually puts on a production called EngPlay as well, so there's lots of theatre to see.

And More! Early on in each term is an event called Clubs and Societies Day, where you can learn about all the clubs on campus and see if any of them do some of the things you do! For almost everything, there's a club or group doing it. For trivia, there's the Quiz Bowl club; for Dungeons and Dragons and other role-playing games, there are WatSFiC and a couple of separate groups; there's the Campus Crusade for Cheese, where you can hang out and eat awesome cheeses; and the Go Club, for competitive players and beginners alike! Watch for details on the WUSA website, wusa.ca!

Make sure to go out and do things that aren't related directly to your academics. Studies show[citation needed, I guess], and personal experience verifies[it's not even possible to give citations for this] that students tend to be happier and more motivated if they're doing some extracurriculars. It's fun, and it allows you to relax, so that you can work better when you do get back to studying. All work and no play makes a student's happiness delay.

Scythe Marshall

THE FIRST-YEARS CORNERED

There are several things that one must remember from Orientation Week. Unfortunately, most of these things will be forgotten for various reasons. Below are a list of things first-years should learn over the course of the week.

- In a pinch, protractors can be used as spoons.
- On move-in day, if you let your parents go through your orientation kit first, there is a VERY uncomfortable silence when they see the condoms.
- Telling jokes you heard at 5:00 AM from Tie Guard will not help you get dates, as what was funny then is incoherent rambling now.
- A good pick-up line is, "What's your co-op sequence?"
- Through an odd warping of space-time, profs are able to talk for 2 hours in a 50-minute period.
- The more you learned in your final year of high school math, the more you have to un-learn in MATH 135 and 137.
- If your roommate is an engineer, you had best sleep with your tie on to protect it, much in the same way they will sleep with their hardhat on.
- Imprint absorbs twice as much liquid as the other leading brand of paper towels.
- Software Engineers do not like being called "Softies," but that's their name regardless of the undertone.

Ian W. MacKinnon

MY FIRST YEAR EXPERIENCE: CHAPTER 5.

mathNEWS

I really enjoyed some of the **mathNEWS** articles last fall, so this term I decided I would start writing. Plus I knew terrifiED so I felt I had to go. At the disorg, terrifiED was late, which was very disappointing.

At the first production night, I didn't know many of the other journalists. When it was pizza time, I decided to sit next to someone I barely knew at a group of people who I didn't know. It was then that I met Janice.

"Hello, what's your name?"

"I'm Janice, and you?"

"I'm George."

"ARE YOU THE GEORGE KENNEBUNKPORT WHO ANSWERS EVERYONE'S QUESTIONS ON PIAZZA?"

"Yes, I am."

"WOW! I FEEL LIKE I'M IN THE PRESENCE OF A CELEBRITY RIGHT NOW!"

Janice is one of the funniest journalists who writes for **mathNEWS** and has plenty of artistic talent. It then turned out that she was in my CS tutorial, and after that we quickly became close friends. We gave each other advice on articles and complained about our CS assignments with each other. It's very important to have someone to bitch about assignments with.

Later in the term I met some more people at production nights. The people are **mathNEWS** are so friendly! And the pizza is so good.

Writing for **mathNEWS** was a wonderful experience. I was harassed/gently talked to by terrifiED for pushing the edge of what **mathNEWS** can legally publish, which was fun.

I was very sad when the end of term event was scheduled for after I have to leave residence, but that's partially my fault for not checking what dates I was voting for and just checking off every Friday night or weekend box. Oops.

The moral of the story? Check what you're voting for. Also, you should come write for **mathNEWS**. You can make wonderful friends and eat wonderful pizza.

George Kennebunkport

7 ALTERNATIVE USES FOR TEXTBOOKS

So you were all excited and bought all your textbooks during Orientation Week. Now, the day of the exam, you say to yourself "I spent $150 on that book, I really should open it at least once." So here's a list of some things you can do with textbooks:

1. **Weight training**: Books are heavy, weighing quite a few pounds each, and are easily lifted.

2. **Look smart**: Books are a means to show off the fact that you are educated and usually weigh less than a stone.

3. **Fly swatter**: Once, during a lecture, Prof. Jackson took his backpack and threw it at a wasp on the ceiling. Do you really think that it would have killed the wasp without a textbook in it which weighed more than twenty Newtons? Really?

4. **Building cardhouses**: Textbooks are sort of like big cards. So you can make really big cardhouses. Since most people won't have enough books to make a really kickass cardhouse, get your entire class involved. You know you have enough books when you are counting the books by the ton.

5. **Hammer**: Textbooks can bang things just like a hammer. They may even weigh many carats more.

6. **Screwdriver**: To put a screw in the wall, line it up where you want it and bash away. Works better if textbook exceeds 12 troy ounces.

7. **Lullabies**: The best way to fall asleep at night is to attempt to read a textbook. Or perhaps have someone bash you over the head with a textbook.

Dave Nicholson

A mathematician cares primarily about the abstract nonsense.

PROF. DAVID JAO

A FIRST YEAR MATH STUDENT'S GUIDE TO WATERLOO SHORT FORMS

ActSci - Actuarial Science. A major you can choose within the math faculty. Pairs nicely with statistics, ambition, or a love for ca$h money.

C&D (CnD) - Coffee & Donut (shop). The Math C&D is located on MC's third floor, and sells cheap food and drinks. Other faculties have them too, but who cares? (Rumour has it that the Science C&D has the cheapest stuff, but you didn't hear it from me.)

CEE - Co-operative and Experiential Education. The name you'll see in the From field of a lot of your emails if you're in co-op.

CFM - Computing and Financial Management. A program that combines both Computer Science and Finance. This program is your ticket to fitting in with both fancy finance people and nerdy computer science people. And possibly your ticket to an identity crisis if you read too much into that.

CLV - Columbia Lake Village. A townhouse - style residence that's super far away from everything you care about. On the bright side, old people like grad students live here, so maybe you can learn from their wisdom or something.

CMH - Claudette Millar Hall. The newest student residence on campus and the only traditional - style residence with AC. Truly the place to be if you're living in residence in the spring term.

C(&)O - Combinatorics and Optimization. A program within the Math faculty. It's probably the answer if you've ever asked yourself questions like "Which major should I choose in order to maximize pleasure, knowledge, and future earnings using at most a specified amount of effort and hours of my time?"

CS - Computer Science. CS students are the people who are qualified for all the co-op jobs you wish you were qualified for. Strangely, they also seem to be the majority of people you meet during Math Orientation.

DC - William G. Davis Computer Research Centre (Davis Centre). A couple lecture halls, some CS prof offices, food, and most importantly, the DC library. It feels almost as much like home as MC. Easily one of the greatest places to study among other math students.

DD - Double Degree. A program that allows students to get a BBA from Laurier while simultaneously getting a BMath or BCS from Waterloo.

DP - Dana Porter (library). This is more of an arts library but it's still pretty cool for a break from the usual study spaces every now and then. Going here may make you feel like you're cheating on DC, but it can offer you tenth floor views, which DC just can't compete with. Sorry, DC.

FARM - Financial Analysis and Risk Management. A program within the Math faculty. Not like the kind with cows and chickens and tractors and stuff.

FOC - Federation Orientation Committee. Basically the bosses of Orientation. They're in charge and they get stuff done. Find them in red vests during Orientation Week. Every faculty has a FOC team, as well as FOC that run cross-faculty events.

GRT - Grand River Transit. The KW region's transit system. GRT is your new best friend, unless of course, you have a real friend who has a car. If so, congratulations on winning at university life already.

KW - Kitchener-Waterloo. They're like the conjoined twin cities of Ontario.

LinAlg - Linear Algebra. A class Math students have to take in first year, and maybe again later, depending on their program.

M3 - Mathematics 3. Screw standard naming/numbering conventions, right? After Math & Computer and Davis Centre, the only logical name for the next math building is Mathematics 3. Stay tuned for Mathematics D and then Mathematics Cinco after that.

MathSoc - Mathematics Society. Want to know more? Stop by MC 3038 to check them out ;)

MC - Mathematics and Computer Building. Also known as your new home. Love it, respect it, get used to it. Expect to have a lot of classes here, and expect to spend a lot of hours in the tutorial centre (MC 3022) slaving over assignments.

MKV - Mackenzie King Village. A suite - style residence located between REV and V1.

PAC - Physical Activities Complex. This is where you will have some of the most unpleasant experiences of your university careers. Like writing exams. Or even worse: exercising.

QNC - (Mike and Ophelia Lazaridis) Quantum-Nano Centre. This is actually an engineering building but it forms a triangle with MC and the SLC so it's sort of in math territory. Also, the tables by the windows looking out on the Peter Russell Rock Garden are some pretty rad places to study (Or at least as rad as study spaces can be).

REV - Ron Eydt Village. A popular dorm-style first-year residence. Unofficially known as the party residence or social residence. But then again, this is Waterloo, so even REV is pretty tame compared to Western, or Laurier, or other schools that actually party.

SLC - Student Life Centre. Centre of the University Universe. Home to great food (including Tim Hortons!), clubs spaces,

study spaces, the turnkey desk, and the only place to get food on campus ²⁴⁄₇: International News. Also conveniently located near Math, Science, and AHS (sucks to be Arts, Engineering or Environment).

Softies - Software Engineers. Weird hybrid creatures that belong to both Engineering and Math. Kind of confusing, but pretty harmless. They are our friends.

UWP - UW Place. A suite-style residence located on University Ave. Not exactly on campus, which is kind of inconvenient, but it's across from the plaza, which makes up for the distance. (Plaza = Burger King, convenience stores, all the Asian food you could ever want, and other such wonders).

V1 - Village 1. Another dorm style first year residence. Less social than REV, but they get single rooms and a better cafeteria, so who even cares?

WLU - Wilfrid Laurier University. That neighbour down the street who we have a love/hate relationship with.

There are a lot more, but these are a few of the important ones. If you hear any others that you're curious about, Google is your friend :) Welcome to Math, and good luck!

TheUndecided

HOW TO mathNEWS

Hello all. HAPPY FIRST WEEK OF SCHOOL. In snooping through the other articles ready for this super-special Orientation issue of **mathNEWS**, I noticed a certain article inviting all you first years to pour some of your youthful energy into writing for **mathNEWS**. As a former writer/editor, I fully support that message and would highly recommend **mathNEWS**-ing to anyone who likes to write, draw, read, meet new people, eat free food, etc. But wait… you don't know how to **mathNEWS**?? Well you're in luck because I'm about to tell you how to get involved in the best dang activity on campus (not that I'm biased or anything).

1. Watch out for signs near stairs in MC that will tell you when production nights are. If you're unobservant or you don't know where MC is, then just remember that production nights are every other Monday.

2. On production night, show up at the MathSoc office at 6:30 pm. You'll be brought to one of MC's second floor computer labs, so if you show up late and there are no **mathNEWS** people at the office, just go directly downstairs. Do not pass GO, do not collect $200.

3. Once you have arrived in the computer lab, get yourself set up to write comfortably. If you feel like being social, sit near other people so you can chat and minimize the amount of actual writing you get done. If you hate everyone[1] or feel like being anti-social for any other reason, plug in headphones, play some music and do your best to ignore everyone.

4. Write something. Like, anything. Our standards are extremely low. Like Apple-Bottom-jeans-and-the-boots-with-the-fur low. And nothing ever gets published under your real name anyway, so you're totally allowed to suck anonymously. Basically just write something that's not super-offensive and we'll print it.

5. Pause your music/socializing/writing/dicking around when an editor announces pizza voting time. Contribute your ideas and/or votes for pizza orders. It is important to remember at this stage of the **mathNEWS**-ing process that pineapple DOES go on pizza, no matter what the haters and non-believers try to tell you. If you are not present at production night, but have written something and want pizza, email **mathNEWS** to let them know by 7:00 pm.

6. After the pizza vote, continue as before until the pizza arrives. At this point, proceed upstairs to the C&D. Try not to drool in anticipation too much.

7. Eat a greater than healthy amount of pizza, cookies, and other such delicious trash that is provided to writers.

8. Loudly explain to anyone who will listen that calories honestly don't count when the food is free.

9. Go home and sleep peacefully with a belly full of free pizza. Or go home and work on an assignment or something. I don't care, I'm not trying to tell you how to live your life.

10. Repeat forever until you graduate/get sick of free pizza.

TheUndecided

1. Note that if you really, really hate everyone, you can write articles from the comfort of your own home and submit them by 9:00 AM on the day following production night. Ask the editors at mathnews@gmail.com to set you up with an account on the **mathNEWS** WordPress!

MATH IS WHAT YOU MAKE OF IT

After spending eight months in the Math faculty, surrounded by mathematicians and math students who were excited to learn math, I was rudely reminded of how contentious a subject math can be when an offhand remark about math at my co-op job got one particularly outspoken colleague started on a rant about how much he hated math.

Hopefully, as math students starting this fall, you don't share his view.

It fascinates me how such views are cultivated. Was it a lifetime of teachers that never bothered to make it interesting? Was it their parents, who accidentally set unhelpful expectations by making too many remarks about how back in their day, they weren't "smart enough" to learn math? Was it from the complete opposite influence, where they were continuously subject to pressures and expectations that were unrealistically high, slowly eroding their attitude with bitterness? Did their friends think it was "cool" to hate math, and they succumbed to Dishion and Tipsord's deviant peer contagion?

Perhaps they just started off somewhere on the wrong foot — learning some misconception early on — and it caught up to them before it was corrected, and it became catch-up ever since. It may very well often just be a perceived lack of skill compounding over years of increasing expectations that breeds such resentment. But the association just becomes too strong, too ingrained, and learned helplessness takes its toll.

One all-too-common misconception is that math is the study of numbers, which is what makes algebra do some in. Another is that in math, there's always exactly one right answer, which is what makes solving for roots of polynomials do some others in. All too often, we hear science teachers say "now we're going to do some math" when all they're doing are calculations, and humanities teachers say "we're going to see some math; don't let it scare you" when they're about to present a single statistic or calculation. Not all are like that, but still there's too many, which only seem to deepen the misconceptions and resentment.

But while many seem to recoil at the prospect of "doing math," we all seem to have some sort of respect for its results — at least, those which we understand. Show most people a proof that they understand, and they appreciate it.

I, and many of my friends, all seem to like math. Two of my closest friends, actually, were ambivalent until fairly recently; one only really took an interest in eleventh grade, and the other in twelfth. If I'm not remembering my conversations wrong, that was when they picked up on the sprinklings of mathematical proof in their curricula and got hooked on it. I've seen them (and chided them for) staying up all night to solve the hardest assignment from Professor McKinnon's section of MATH 147 last year.

Personally, I've liked math since about second grade, but for a much less pure reason. I hit most of infant-hood milestones — walking, talking — late, and my parents were concerned that I'd also be behind in my academics, so they taught me math, which was the only thing they really could. But they learned math in China, and I grew up here, so their expectations were way off and I was the best at math in my grade at every school until I started studying here. Fortunately for my relationship to math, but unfortunately for me, I was also slow in being social, so I grew up peerless yet surrounded by my peers, and being "good at math" was the thread I hung on until I found out I was also "good" at science and CS and then actually found friends.

The first time I could say that I really appreciated math, though, was sometime in fifth grade when my parents got me an elementary-school algebra book and something clicked about *systems*. It turns out that I really like figuring out and playing with formal systems, whether it's in a video game or the systems of accounting or economics or political processes or law or science — or math. Suddenly, I saw a formal system underneath the algebra, and I was hooked on figuring it out. It's a shame I can't remember what the book was called.

It's also somewhat a shame that I'm interested in the system itself rather than working within it. I'll be really interested about its foundational rules, their motivations, and their limitations, but for some reason I'm mostly unconcerned about actually finding results within it. I spent weeks with one of my friends last Winter trying to prove a limitation of common mathematical language (we even wrote a paper for **mathNEWS** to publish but terrifiED said it was "too long to publish") but I couldn't be arsed to get more than 18% on that MATH 147 assignment.

Speaking of proof, if you're taking MATH 145 this Fall you'll be getting real intimate with proofs (MATH 135 also discusses it, but not nearly so much in depth). Professor New last year made the first half of the course just about mathematical proofs, building up our common framework of mathematics from the foundations. We learned first-order set theory, axiomatically (by presumption, without proof or explanation) declared what mathematical objects, statements, and proof were, and from it we built our way into learning actual first-year algebra in the second half of the course.

But the fact that we defined proof *axiomatically* means that we could actually go and define it a different way and get a totally different "math" than as we typically understand it. Perhaps you'd just call it a different "logic" than math, but that's beside the point. Different axioms can give us vastly different worlds.

Proof by contradiction is motivated by the principle of explosion: by assuming a contradiction, one can prove anything. It's a pretty simple trick: let **P** be some statement and **Q** be whatever statement you want to prove. Suppose **P** is both true and false, which suffices as our contradiction. Then **P** is true, so either **P** or **Q** is true, by disjunctive introduction. But if **P** or **Q** is true, and we also know that **P** is false as we assumed, then **Q** must be true by disjunctive syllogism.

Then if we abandon either the disjunctive introduction or the disjunctive syllogism, we end up with what's called a **paraconsistent** logic, where the principle of explosion doesn't hold. We can go even further and change how we define truth. What happens if we abandon the law of the excluded middle and *let* things be both true and false at the same time? **Relevance** logic is a four-valued logic where "true" and "not true" are a separate dimension from "false" and "not false."

Perhaps you're thinking now that those can't possibly be useful. Well, I present three counterarguments: mathematics is purer and more beautiful when it doesn't have applications; this stuff is fun to think about anyways; and paraconsistent logic is actually important when reconciling contradictory messages within networks and relevance logic is actually important in certain digital circuits where it makes more sense to propagate both truthiness and falsiness instead of relying on one being the absence of the other signal.

You probably won't actually get into any of these logics in an undergraduate course here at the Faculty of Mathematics, and for that matter there's no reason you have to be interested in them, but throughout your studies you'll be exposed to many new ways of thinking on many subjects under the guidance of many professors through your forty-or-so undergrad classes.

Some of those ways of thinking might be enlightening while others might seem impenetrable as you tear your hair out trying to wrap your head around it. Some of those subjects might be so familiar and intuitive that you pick it up immediately while others might be so alien as to force you to resort to memorization. Some of those professors might be so charming with the way they teach or engage or demonstrate material that you'll be filing Form 70a's to get in more of their classes and some might teach in a way so incompatible with the way you learn that you'll be filing Form 70b's to vent your frustrations. Some of those classes might be so interesting that you can't help yourself from monopolizing your prof's office hours and some might be so boring that you can't bring yourself to stick with it. Luck will certainly play a part in your experience here.

Then again, as a student in the Faculty of Math, you've already lucked out quite a bit: your professors are educators. Not just educators in the sense that part of their job is teaching, but educators in the sense that part of their hiring interview involved a test of their ability in and philosophy to teaching. At least in math, so long as you're putting in effort, your profs really will care about your learning. They're reasonable people that will provide reasonable accommodation for reasonable requests. They hold consistent office hours and are really happy to see you during them, even if you're tripping over your tongue the entire time. Literally just for this term, the professors for CS 241E/245E/246E and the CS advisors spent a week or two rescheduling classes at their *future* students' requests to fix a timetable conflict, and the only unreasonable part of the schedule that's left is an inevitability of the schedule that the Registrar's Office, in their infinite wisdom, handed out.

There's no doubt that some of your experience here will come down to luck, but the rest of it has to do with where you focus your efforts. If you insist on making sure that you're not "being cheated" on anything, you'll be putting a lot of energy in looking for the negatives and very likely missing all the positives of your experience.

I'm already familiar with those types; that colleague of mine during co-op this Spring was one, and he had nothing good to say about his experience. Everything I heard from him was in some way a complaint about the courses he's taken or the faculty he's interacted with or some part of the University's procedures. If he didn't understand the point of a course he said it was useless; if he had to concede that it was useful then he said it was hard; if he didn't get grades he wanted he said the markers were unfair; if the topic of on-campus construction came up he said that he paid too much tuition for the eyesore.

Why not put your energy into looking for the positive side of things instead? If a course doesn't seem to be useful then go and figure out what you can take from it, directly or indirectly, outside of just a credit. If a course is boring then look for ways to connect it to your interests. If a course is hard then revel in the accomplishment of figuring it out. If your grades aren't as you wanted then use it to motivate a reflection of how you learn. If construction is an eyesore then remind yourself of how nice QNC and E7, the two newest buildings on campus, are.

You'll hear a lot of cursing about PD on the r/uwaterloo reddit. Personally, while I do feel that much of PD is misguided, I learned a lot about the basics of the job search from PD 1 and PD 11 was a wake-up call that I need to keep my writing skills polished. In 1A I was (pre-curve) failing MATH 145 because I wasn't able to keep up with its assignments, so I learned how to cram for that exam and I figured out that my biggest issue was just remembering a lot of the quite-chaotic material, which I fixed for 1B when I took seven classes and still maintained my average.

That's not to say that you should ignore the bad stuff; part of self-help and self-healing is acknowledging when things aren't okay and properly experiencing your negative emotions. But if there's nothing pleasant to return to, then you've gotten yourself quite the predicament.

Whether or not you're legally an adult, you've now found yourself in the adult world. You have a lot more freedom to do and think and perceive what you want. But with that freedom comes the responsibility of the consequences of what you do and think and perceive.

And at the end of the day, whether regarding how you see math, how you work within math, and how you live as a math student, your experiences are what you make of them.

dawdling

CONTRIBUTE TO mathNEWS!

Hello, dear reader!

Now that you've gotten a taste of the grand publication that is **mathNEWS**, I'm sure you're wondering: how can you, esteemed reader and person of great intellect, contribute to such a beautiful thing?

Luckily for you, it's easy! No skill or talent is required to join the enterprising team of writers, artists, and editors that is **mathNEWS**. (Well, there may be a little required if you want to become an editor. But it's not much, I swear!) There are quite a few ways to contribute to **mathNEWS**, and all are listed below:

1. You can show up to one of our **mathNEWS** production nights! This is when most of our content gets produced. It's always a fun way to mingle with other **mathNEWS** people, and get free pizza to boot. They're every second Monday, from 6:30pm to about 9pm. We tend to meet in the MathSoc office, then go down to one of the second floor computer labs. Watch for posters around MC that will go up when a production night is near! There's no obligation to keep attending, so it's a good way to test out the waters and see how you like **mathNEWS**.

2. Email your article/illustration/**profQUOTE** to mathnews@gmail.com! This method does not include pizza and socializing, but who knows, maybe you're tired of both those things.

3. Drop it off at the **mathNEWS** office, MC 3030. The editors are often around and in desperate need of human contact, but if they're not, you can just slide papers under the door.

4. Perform a dark ritual to summon the fabled **mathNEWS** gods of olde. This is by far the most difficult, as **mathNEWS** is not legally authorized to publish the incantation needed for this bit of dark magic. You'd have to do your own research, gather your own sacrifices, use your own blood, etc. It's much easier just to come to production night.

With all these ways to contribute to **mathNEWS**, who needs a real social life? Join **mathNEWS** today to feel loved.

swindlED
Editor, **mathNEWS**

N THINGS TO KNOW ABOUT WATERLOO

WALDO STILL NEEDS TO LEARN A FEW MORE THINGS TOO.

- The geese are here to stay, no matter the season.
- If you want to get involved at Waterloo, check out Clubs and Societies Day in the Student Life Centre to see what clubs you can join.
- Sometimes random things end up in random places, like the snowman on top of the Biology building one winter.
- The ninjas always seem to invade "N Things" but no one really knows why.
- You'll likely figure out what kind of university career you want to take and how you need to get there by the end of your first term (or your first year).
- There are underground tunnels and overhead passes between buildings for warmer travel during the winter.
- If you need certain things, like stationery or printing, MathSoc is often the cheapest place on campus to get it.
- Time management and scheduling can play a huge part of any term.
- **mathNEWS** can be a good escape from the hustle and bustle of Friday mornings every couple of weeks or so.

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

mathNEWS is a normally fortnightly publication, funded by and responsible to the undergraduate math students of the University of Waterloo, as represented by the Mathematics Society of the University of Waterloo, hereafter referred to as MathSoc. **mathNEWS** is editorially independent of MathSoc. Content is the responsibility of the **mathNEWS** editors; however, any opinions expressed herein are those of the authors and not necessarily those of MathSoc or **mathNEWS**. Current and back issues of **mathNEWS** are available electronically via the World Wide Web at http://mathnews.uwaterloo.ca/. Send your correspondence to: **mathNEWS**, MC3030, University of Waterloo, 200 University Ave. W., Waterloo, Ontario, Canada, N2L 3G1, or to userid mathnews@gmail.com on the Internet.

WELCOME TO WATERLOO!

gridCOMMENT *141.0*

Greetings new mathies! This is the **gridWORD**, the crossword puzzle that appears in every issue of **mathNEWS**

The publication of a new crossword begins a contest where you can submit a completed grid for a chance to win a $5 gift card to the Math Coffee and Donut shop (i.e. the Math C&D). The contest's deadline is the next issue's production night, usually at 6:30 PM the second Monday after. To break a tie in case of muliple correct submissions, we pose a **gridQUESTION** and hint that we seek the answer that is silliest, sunniest, sappiest, saddest, etc. We retrieve your crosswords and answers from the **BLACK BOX** on the third floor of MC, beside the Comfy Lounge, so drop them off there! The first contest will begin with the next issue.

The solutions to this issue's **gridWORD** can be found on the back page.

Happy puzzling!

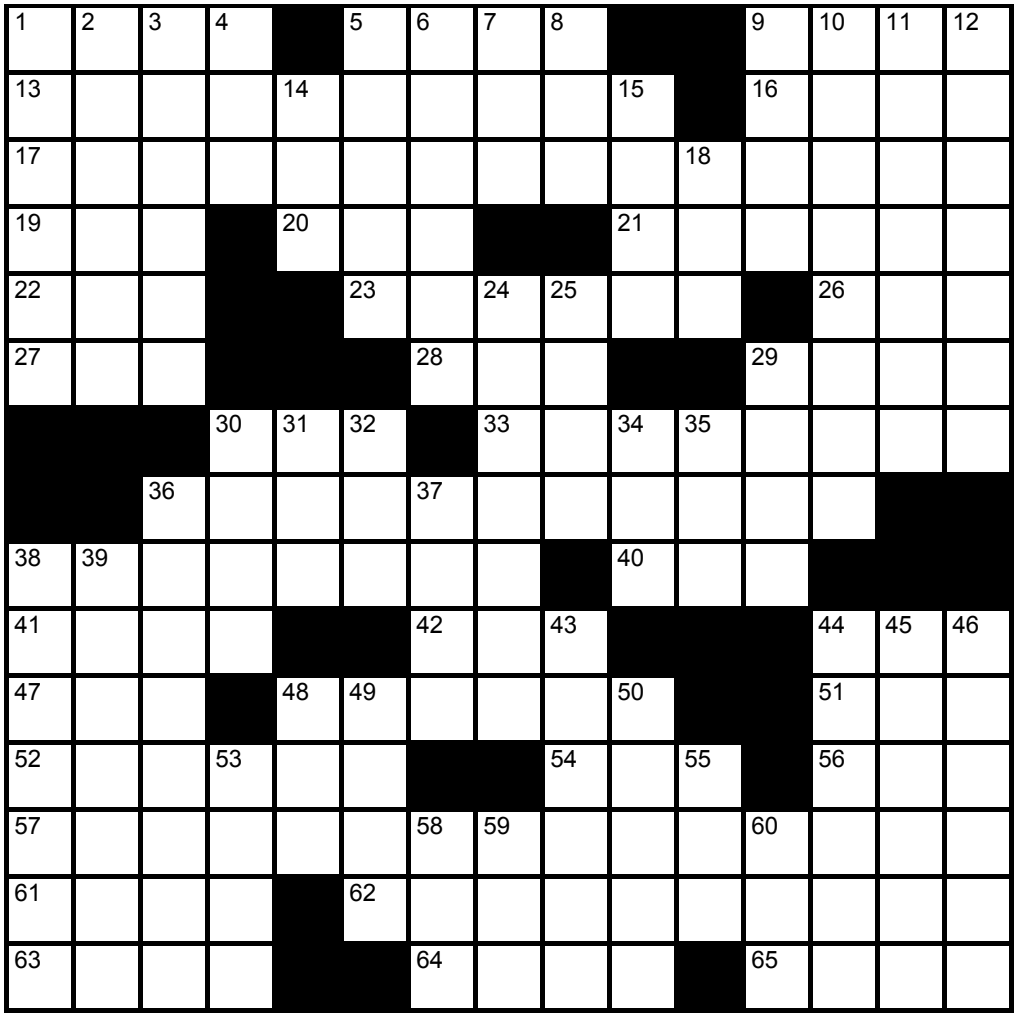
swindlED

ACROSS

1 (With -gate) to repeal a law
5 Additive identity
9 Halifax water, for short
13 "I'm a doctor, look at meeeee!"
16 What the postman brings
17 High pressure dinner bell on the ranch
19 It might cause a blackout
20 Tear
21 Oxygen/Nitrogen/Tin/Lanthanum
22 ____ Speedwagon
23 Happily
26 Small town between London and Cambridge
27 The time in Waterloo these days
28 Hubbub
29 A Romanian hero
30 Soldiers
33 An association of perjurers
36 According to instructions
38 Group of chef Childs' devotees
40 Ad
41 ____ Major (or Minor)
42 Zollinger-Ellison Syndrome, for short
44 Popular online image format
47 Tiny vegetable
48 Marshes
51 Literally the letters "HVR" (Look, making these things ain't easy)
52 The crew that fixes your work computer
54 You have a right one ... (see 14 down)
56 First lady
57 Kind of a jerk
61 Historical periods
62 "All right, Mr. DeMille, I'm Ready for my close-up." film
63 Rave
64 Art school in Providence
65 Monkee Jones

DOWN

1 Current
2 What Scotty did up
3 Be someone's gym buddy a 2nd time
4 A great place to see space rocks in Toronto
5 Woody Allen mockumentary
6 A laser manufacturer
7 Q _ _ _ U
8 Technology that makes Scantron possible
9 A great place to see butterflies in East Texas
10 Mythical cycle in Norse mythology (alt. sp.)
11 ___ ____ marry me? (2 wds)
12 Grey skies are gonna (2 wds.)
14 ... and a left one (see 54 across)
15 Pair of -OH groups
18 Even a little bit of
24 Appointed by the court, as a guardian
25 Just __ __!
29 Ivanka's bro
30 A kind of neural tissue
31 "Hometown Proud" grocery chain
32 Help!
34 "I don't know..."
35 Monsanto specialty
36 Type of police dog
37 _____ Shah Pahlevi
38 Planet with a string of pearls
39 Your cat's might be infected
43 90's vocal group The Girls, known for their skill at extracting ore
44 Aussie lassie
45 2010 indie platformer starring Captain Viridian
46 Smurf with a chef's hat on
48 Blue
49 Items that were conspicuously hard to find in 2003
50 Economized
53 ____ while (former)
55 Pixar's Remy, for example
58 Germ., Fr., Bulg., etc.
59 First nurse, in a Roman manner of saying
60 Unsure as of yet



lookAHEAD

SUN SEPT 1	MON SEPT 2	TUE SEPT 3	WED SEPT 4	THU SEPT 5	FRI SEPT 6	SAT SEPT 7
	Labour day	Tie Ceremony	First day of class!	WUSA First-Year Fair Waterloo Fest	Orientation Awards Ceremony	Black and Gold Day

SUN SEPT 8	MON SEPT 9	TUE SEPT 10	WED SEPT 11	THU SEPT 12	FRI SEPT 13	SAT SEPT 14
	WUSA Welcome Week (all week) WUSA Warrior Breakfast		Course reserves lifted	WUSA Chocolate Taste Testing	Friday the 13th 💀😱	

mathNEWS DISORGANIZATIONAL MEETING

mathNEWS is like an old friend. It shows up, pretty regularly, every other Friday; makes you laugh, cry, and scratch your head trying to solve puzzles; and then says, "See you in two weeks!"

Now, **mathNEWS** doesn't just appear magically; it is put together by a very tight-knit group of writers, artists, proofreaders and glorious editors. All of us here at **mathNEWS** are always looking for new writers, proofreaders, artists, puzzle-writers, and general whathave- yous.

If you are interested in becoming a part of the hot mess that is **mathNEWS**, come out to our disorg meeting in the beginning of September. There'll be posters around MC to let you know when it is.

The Editors

THIS WEEK'S gridSOLUTION

A	B	R	O	■	Z	E	R	O	■	■	H	R	W	C
M	E	E	S	E	E	K	S	M	D	■	M	A	I	L
P	A	S	C	A	L	S	T	R	I	A	N	G	L	E
E	M	P	■	R	I	P	■	■	O	N	S	N	L	A
R	E	O	■	■	G	L	A	D	L	Y	■	A	Y	R
E	D	T	■	■	■	A	D	O	■	■	E	R	O	U
■	■	■	G	I	S	■	L	I	E	G	R	O	U	P
■	■	A	L	G	O	R	I	T	H	M	I	C	■	■
J	U	L	I	A	S	E	T	■	H	O	C	■	■	■
U	R	S	A	■	■	Z	E	S	■	■	■	S	V	G
P	E	A	■	S	W	A	M	P	S	■	■	H	V	R
I	T	T	E	A	M	■	■	E	A	R	■	E	V	E
T	H	I	R	D	D	E	R	I	V	A	T	I	V	E
E	R	A	S	■	S	U	N	S	E	T	B	L	V	D
R	A	N	T	■	■	R	I	S	D	■	D	A	V	Y