ME-SA, YOU-SA, WE ALL SCREAM FOR WUSA!

"HOW WOULD YOU RE-BRAND FEDS?"

And here we are. The last **mathNEWS** issue of the term.

It always seems to come faster than I expect, which you think really wouldn't happen since I measure time by asking "is this a **mathNEWS** week or not?"

But in any case, whether we're ready for the end of term or not, it's upon us. And this here issue of **mathNEWS** is a damn good way to end the term, and the 2018-2019 year of **mathNEWS**, really. In most spring terms before this we published 12 or 14-page issues, and keep in mind 5 of those are in there even if we don't have any articles. No, this is a 26-page issue of **mathNEWS**, *in a Spring term*. That used to be good for Fall term, let alone fucking *Spring*. Right to the end, this year's batch of new **mathNEWS** writers leave me astounded. To the younglings I say: *magnifique.*

Now just don't get cocky you little shits.

Alright, let's leave the lynch mob fodder aside for the moment. The quantity is hard to miss, but boy howdy do we also have some quality for you this issue. From cy's article of the issue-winning *Recursion's Infinity*, to the aptly titled *Cooler Than You Knew* from MFCF's Robyn Landers, to every other piece of wacky bullshit the writers came up with this week. Spoiler warning, most of them are about WUSA.

Something I'm personally rather happy about this issue is that the editors finally managed to find a good list of holidays so the **lookAHEAD** isn't always half-empty. Well, good by my definition at any rate. I know no-one actually looks at the **lookAHEAD**, but this week I encourage you to do so dear reader. Maybe you'll find a new holiday to celebrate.

This isn't quite the end of **mathNEWS** for the term though, the End of Term Social is still coming up, and us editors still have an anthology and orientation issue to put together. Who knows, maybe we'll be able to drum up even more new writers than this year. Make those issue extra thiqqq.

Good luck on exams! I'll see you all again in January, ya boi managed not to bust. 😎☀

swindlED
Editor, **mathNEWS**

PERMANENTPSEUDONYM	Mad Sam and the Bats out of Hell
SILLYCONE	FEDS - Fixing Erectile Dysfunction Slowly
LAZARIDIS COWBOY	Union of Soviet Student Associations
BEYOND META	Waterloo Undergraduate Student Society - WUSS
NOT A RHYMER	UOFT - Undergraduates on the Federation Team
UHH	*(Audible screaming)*
ZETHAR	By dissolving it
NANI	Goose Student Association - GSA
SIGSEGV	**W**ilfrid Laurier **U**ndergraduate **S**tudent **A**ssociation - WUSA
A MATHEMAGICAL PSYCHIC & ASTROLOGER	Feds is getting tattoos? I recommend a big pink tie over their chest.
XAVIENTOIS	REEE - Republic of Evil Enterprising Emus
DAWDLING	Union of Waterloo Undergrads - UWU
EPSILON SCREWN	New Students' Federation Waterloo - NSFW
SANDWICH EXPERT	WOOOSAAAAA
FINCHEY	I say WU, you say SA! WU! SA! WU! SA! **WU! SA!**
VARIOUS PSEUDONYMS	UNF - UNF's Not FEDS!
whyOS	Waterloo Tutee's Federation
swindlED	The Democracy Formerly Known as FEDS
terrifiED	FEDS. It's perfect just the way it is.
staplED	With a branding iron that says WUSA. Duh.

ARTICLE OF THE ISSUE

The final article of the issue award of volume 140 goes to cy for *Recursion's Infinity*. The granting of this award is due in no small part to the sheer amount of nerve it takes to *poke fun at the editors **in our own goddamned newspaper***. Like, holy shit. That takes some **_serious_** guts. And for that, cy, I salute you.

On top of that though, *Recursion's Infinity* is extremely well written, and hilarious. Pulling off a math-based joke like that takes some real skill.

Congratulations again and don't forget to swing by the **mathNEWS** office in MC 3030 to pick up your prize!

swindlED
Editor, **mathNEWS**

I for one welcome our new WUSA overlords.

ANUJ OPAL, math**NEWS** EDITOR FOR SPRING 2019
ALONG WITH ESTHER AHN, TERRY CHEN AND JOSH RAMPERSAD

profQUOTES 140.6

CO 351: MARTIN PEI

66 Oh! The mic is sensitive today… just like me.

66 I'm not trying to do shady things, but here's one way to make money.

66 I have no idea how to make money… I'm in teaching.

QIC 823: DAVID GOSSET

66 Compare to what Hamiltonian in the real world, this is pretty weak sauce.

66 I realize this looks totally crazy right now, but it will make sense later.

MATH 237: PATRICK ROH

66 Let's get our algebra freak on.

66 Don't take pictures of me, I'm hideous.

66 You know NOTHING!

66 I gotta scare you before the weekend.

66 If Wolfram Alpha knew the exact value of pi, you might as well believe that vaccines don't work.

66 It's all bullshit.

66 F stands for fudge, of course. (Professor Roh likes to keep it clean.)

66 The pain, the pain, the pain.

66 Remember when you were young and dreamt of working at NASA?

66 You should never trust Professor Roh, he's kind of sketchy.

66 Second degree son of a-

66 Remember this so that you don't have to smack me later.

66 If you want to use degrees, become an engineer.

66 You gotta tell me when I make a mistake so you can hear me scream.

66 Even Jason from Friday the 13th is scared of me.

66 I may be illiterate.

66 I want to make sure your head's exploding at a reasonable rate.

MATH 245: BLAKE MADILL

66 When I say algebraically independent, I mean starfish is not secretly twice smiley face.

66 Checkmark looks too much like v, so let's replace it with… an apple.

66 Since [the apple]'s 3-0, I'll draw a shiny line."

66 🍎 - 7🍎 = ☺, since I regret doing this.

66 With the addition of the UofT students, this is the best attendance we've had all term.

66 Today's lecture will be short, cuz I'm running out of math.

TONIGHT, MY PEN RUNS DRY

After missing a variety of production nights as well as losing my goddamn mind trying to leave the country, I've genuinely got nothing to contribute to this **mathNEWS** issue, and I think we can all learn a few things from this.

First, don't bite off more than you can chew. My dumb ass figured arranging an international co-op would be fine, despite the obvious warnings that it would be difficult. It has brought me nothing but immense stress, and I should have seen that coming. Do your research, kids. Don't walk into something unprepared—you're only hurting yourself.

Second, take time for yourself. Pay attention to your body and your mental health. Don't let yourself get to a point of near-breakdown. If, for example, your body starts to act up, writing it off will not help you. Your mental health is just as important, and you shouldn't ignore that either.

Third, it's easy to not have much to say. Sometimes you just don't feel creative, and in those times, you just have to push through. That kind of perseverance "builds character," as some old fucker might say. Genuinely though, persevering will only help you in life. It sucks and is hard, but it gets easier with time.

Hopefully you found any of that generic, easy-to-write advice useful. I tried to pump something out that people will at least not hate reading. Have a great rest of your day. Best of luck with your future endeavours. I hope your next term goes well.

One day I will be free of corporeal form.

Free me.

permanentpseudonymn

COOLER THAN YOU KNEW

You go to class, you listen to the prof, and unless they say something worthy of Prof Quotes, you wonder if they have a life beyond the blur of Poisson distributed finite element matroid induction halting problems. But profs are people too, and may be cooler than you knew.

I interviewed Combinatorics and Optimization professor Henry Wolkowicz about how he came to UW and his connection to a major pop culture event as we approach its 50th anniversary this summer.

RL: Where did you do your undergrad degree?

HW: I did everything at McGill University: undergrad, master's, PhD. I grew up in Montreal, ever since I was two years old.

RL: What drew your interest to the field of C&O?

HW: Well, throughout my life — what's the easiest way to describe this — I used to like canoeing, and I've gone where the canoe took me. I took a course in optimization, and the last lecture covered something called linear programming, the Simplex Method, and I asked the instructor if this was on the exam. I thought he said it's not, but about 30% of the exam was on this last lecture. I saw him in the hall after and said I know I didn't do all that well, because I thought you said it's not on the exam. So he gave me a project to do on linear programming. I got really interested in it and worked on it for about a month. After I handed it in to him, he asked "What are you doing next year?" And that's the only reason I'm in mathematics!

RL: Sometimes it pays to not listen closely to the prof!

HW: *[Laughs]* That was the only reason. I didn't know what I was going to do the next year. I probably wouldn't have stayed in school.

RL: What drew you to the University of Waterloo?

HW: Andy Conn was here and he actively recruited me. My wife was doing a post-doc at Brown University. We were looking for a place where we could both be together, so we came here. I came and Andy left!

I came upon a child of God, he was walking along the road
And I asked him where are you going, and this he told me:
I'm going down to Yasgur's farm, I'm gonna join in a rock'n'roll band,
I'm gonna camp out on the land and get my soul free.

RL: So let's talk about something cool about you that nobody knows. Years ago you told me that you went to the Woodstock music festival on your motorcycle! What were you doing in the summer of '69? Did you and some guys from school have a band and you tried real hard?

HW: *[Laughs]* No, we just listened to a lot of music. What happened was I saw a video for the Monterey Pop Festival and I really got off on it. The images and music were just fantastic. Then I heard there were these others happening that summer: Atlantic City, and then Woodstock. So I went down to Atlantic City also on the motorcycle. I became almost deaf. You know what those huge speakers are like — I got too close to one of them. That night I couldn't sleep; my head was pounding.

Then can I walk beside you? I have come here to lose the smog,
And I feel to be a cog in something turning.
Maybe it is just the time of year, or maybe it's the time of man,
But I don't know who I am, but you know life is for learning.

So then we decided to go to Woodstock. Some people got advance tickets; I just don't get around to these things, so I just went down there by motorcycle. We found it pretty easily, and I drove up and saw this fence knocked down, with lots of people on both sides. I got through the fence and asked people where to buy tickets. We sat down, waiting to find out about tickets, and then this announcer came on and said the concert will not start until everyone gets behind the fence. I guess they wanted to fix the fence.

RL: And how well did that work?

HW: *[Laughs]* Nobody moved, we just sat there and sat there. Eventually they came back on and said okay, it's a free concert.

RL: Which bands did you most want to see?

HW: Jimi Hendrix was new to me at the time and he was one of the big ones I wanted to see. Joan Baez was there. Another one that I really enjoyed before I went was Paul Butterfield. Iron Butterfly was supposed to be there but they ended up not playing. But I guess it wasn't so much the ones I went there to see but rather some other ones that I really enjoyed.

RL: Which performances did you find most memorable, even if they weren't the ones you were anticipating?

HW: Crosby Stills and Nash. This was the first time they played together. Their song was on the PA system — they played music before and in between bands — so that was really good. There was a lot that I liked but the one that stuck in my mind was Creedence. I'm not sure they were big before, I hadn't heard them before. When I got back I had to get their album but it was nowhere to be found in Montreal. Every day I kept going back to several stores to ask for it, so they ordered it for me and I got the name "Creedence Freak". *[Laughs]*

RL: He's the guy! He's the guy who keeps pestering us for a CCR album!

HW: So I really got off on Creedence. And Creedence seems to have really made a name for themselves because you go to parks nowadays and they're still the one that everybody's playing. The last morning half or three-quarters of the people

had left because of the rain, but I stuck around. My friend wanted to leave: she was miserable, wet and muddy. I was really having a hard time staying up the last morning, but Paul Butterfield was on, and of course Jimi Hendrix. I had to see him. I remember sitting there and just falling over and getting up again, because I had such a hard time staying awake *[laughs]*. He played extra long.

RL: So you got to see the one of key people you were hoping for.

HW: Yeah, and Janis Joplin was there. I saw her in Atlantic ity as well. She was really fantastic in the Monterey movie, so she was a big reason I wanted to go.

RL: You know Joni Mitchell's Woodstock song? She wasn't there — she watched the TV news reports.

HW: Joni Mitchell was at Atlantic City. I'm not sure why, but people were ignoring her and she ran off crying. She didn't do her whole set.

> *By the time we got to Woodstock we were half a million strong*
> *And everywhere was song and celebration.*

RL: Let's try to tie this in with math a little bit. Was there anything surprising or interesting about the experience in sort of a mathematical kind of way?

HW: Yeah! My brother, he did think ahead, he did buy tickets. He was going in a van with some friends. Of course I never expected to find him, and I forget which day, but I did find him!

RL: In half a million people! Some odds!

HW: Yeah, I found him, and I remembered where his van was parked. He was up at the top of the hill to the left of the stage. It was good I found him because when the heavy rain came they let us into the van.

RL: So you had some shelter.

HW: Yeah with thirty other people! *[Laughs]*

RL: That's a lot of people to put in a van. Wasn't that a college prank in those days — see you many people you can cram into a VW?

HW: Yeah, we crammed in, a lot of people wanted to stay dry.

RL: They say that people who claim to remember the Sixties couldn't really have been there, I guess because of the effects of certain substances, so how can I trust anything you're telling me? If you were really there, how can you remember it?

HW: One thing I do remember is the guy on the stage getting up and saying all of you who've taken the brown acid, be careful, it's bad.

RL: That brown acid has lived on as a meme. I should caution you not to admit to anything because you might get denied permission to cross the border for your next conference.

HW: I won't admit to anything. There was a book by Abbie Hoffman titled "Steal This Book". It's not in every edition, but in one of the editions there's a page with a picture of Woodstock. [dramatic pause] I'm in that picture!

RL: Are you really!?

HW: You go look at the top of that hill that I was describing, there's a guy in a white t-shirt standing there. That's me.

RL: Cool! You're part of the official record so I guess I do have to trust what you're telling me. There's photographic evidence.

HW: Look at the book, but you have to steal the book.

RL: According to the title anyway. Did you sense at the time that Woodstock would be a significant cultural milestone that we'd still be referring to 50 years later, or did it just seem like a pile of mud and loud music and poor organization?

HW: Not before going, but while we were there it really was a major event. We were the second largest city in New York state for a brief time. Half a million people is a lot of people. And the only way you could get in was by helicopter or motorcycle.

RL: You could thread your way past the traffic jams.

HW: Well I could just go over the fields which I did several times because everybody else was starving but I could go out and bring some food back.

RL: You could make a little cash on the side.

HW: *[Laughs]* I didn't but you could. I had to go a long way to find stores that weren't totally sold out. Everything for miles and miles around was one giant parking lot, and everything was sold out. There was a guy there, Biff Rose — I have his album at home — he was this fantastic blues piano player. He was in the back of a truck selling apples *[laughs]* so he was making some money. He wasn't one of the performers but I found him and said hello to him.

> *And I dreamed I saw the bombers riding shotgun in the sky*
> *Turning into butterflies above our nation.*

RL: Would you identify yourself as a hippie in that time period?

HW: Well, I don't know, I was never — if I was a hippie I was really strange. I was in all sorts of different things. I was a boxer for quite a while, very serious and pretty good. I often say that this era was really lucky for me because it got me out of boxing and away from brain damage, if you get my meaning *[laughs]*. It was a backward way of looking at things. But I was a very serious athlete, I was very serious in football but I hurt my knee badly. I could still box because you don't really need

the knee strength for changing directions. I was really pretty good at it. I got written up in a newspaper article, and because I was at the university the title of the article was "Wolkowicz, smart boxer" [laughs].

    We are stardust, we are golden,
    And we got to get ourselves back to the garden

RL: Did you believe in the Age of Aquarius and all the counterculture of the hippie era, its vision of the future?

HW: Like I say, I was not a typical hippie, not connected in any very large group. Didn't belong anywhere I guess.

RL: Anything else about the Woodstock experience?

HW: *[Turns to his computer to look at his personal web site.]* I made a list of all the groups I really liked. Richie Havens started it out. For my friends back in Montreal Richie Havens was the man. Arlo Guthrie was there. We all listened to him, Alice's Restaurant. We really liked Santana. Joan Baez was one of the people next to Bob Dylan that we all listened to. And of course Jimi Hendrix.

It was truly remarkable that there was no violence. One has to realize that most of the people attending were totally anti-establishment. The police were the "bad guys". Just seeing one policeman would have caused anger. It may have taken only a small spark to start big riots against the police, but the police had zero presence and perhaps that's what saved the day. Or maybe everyone was just enjoying the music too much! *[Laughs]*

❧

Prof. Wolkowicz has an extensive web site at `www.math.uwaterloo.ca/~hwolkowicz` covering mathematics, a bit of family history, Woodstock, and more. (Ask him about John Lennon and Yoko Ono some time!) Cooler than you knew.

Robyn Landers

Lyrics to "Woodstock" by Joni Mitchell, copyright Sony/ATV Music Publishing.

THE NEXT N WORDS

People are prototypal. Someone somewhere came up with some charming personality and lots of people liked it so much they molded themselves after it. Sure, the first one was charming enough, but everyone else that comes after is just a *caricature* of the original personality, and hardly interesting at all. Point to any person on the street and almost guaranteed they're a copy of someone you've seen before. Point to another person on the street and they're *probably* not very similar to the first person you pointed at, but they're both caricatures nonetheless and so equally dismissible. If you ask me, the whole point of being alive is to avoid spending all of your days alive being a caricature of somebody else and instead be a new prototype, even if it's the most horrible reprehensible one yet.

Anyway, in my opinion, food could very well be the least sexy thing ever, but the NPCs in my cooking class must have thought otherwise. Maybe I just wasn't being affected by some aphrodisiacs slipped into the ingredients we were supplied, but in any case, I found myself at a vantage point watching everyone play the game with one another while I performed the majority of the duties in that classroom. I laundered the aprons and towels and folded them and I organized the tools and I managed the stock in the backroom all while makeup-clad NPC girls teased the muscular NPC guys who played loud electronic music on their cell phones. But don't get me wrong. For all the flirting and the games they were playing, all those NPCs were actually pretty good at cooking, and I was not. I mean, the whole reason I was doing those tasks and not cooking is because I really actually sucked at it. At least the girls were nice about it, though, and they could be encouraging when they felt like it. The NPC guys with big arms kept taking the knife out of my hands and showing me how to chop things, so you can see why I tried my best to avoid that as much as possible. So when the time came for us to pick a francophone dish of our choice and teach the whole class how to make it, I picked *chakchouka*, because it was easy to make and also the combination of tomatoes and poached eggs is safely delicious, or rather so I thought. The whole class of NPCs hated it, which I only knew because they love to talk behind other people's backs. I mean, Jesus, way to be disparaging to a shy and petite girl with the sensitivities of a delicate flower, and you can see why I'm not particularly fond of any NPCs even if they're nice to my face. Besides, everyone else picked boring dishes like chicken or those long doughnuts with chocolate on them, and I was the only one who picked an interesting one which is why my dish was picked in the first place, so if you ask me they were wrong. I was going to leave the room to sulk in the girls' bathroom when I noticed some guy eating his *chakchouka* ravenously and I asked him if he liked it. "Yes, it's fucking great," he said, and kept eating it, and I don't mean to be insensitive, but the first thing I thought is that it was because he was black. I mean, *chakchouka* is an African dish, after all. But then I later found out that he was from Ethiopia and the dish is from Tunisia so I don't think it's related anymore. It doesn't matter, though, because that encounter was sealed in my mind. I only found out his name later, and I guess if they really did put aphrodisiacs in my food, then it took a while to finally work on me.

cy

WAS YOUR OSAP OPEN-FOR-BUSINESS-IFIED? TRY THESE N WEIRD TRICKS

1. First things first, if we can de-business-ify your OSAP, then all our problems are solved. You can get both your housing and tuition allotments re-evaluated, where you can provide extra context, which could net *you* more crypto money. You have to do this through the Financial Aid office, so I'd go camp outside their office now if I were you.

2. Student Lines of Credit are the most obvious source of private funds, and with the big banks (CIBC, RBC, TD, etc) you can get some real low interest rates, as good as prime — 0.25% (that's 3.7% rn). Now, you'll still have to make interest payment throughout your time at uni, but you can get as long as two years after graduation before you have to start making payments on the principle. Shop around for the best for you, but CIBC seems to be the best all-around, imo. Debt really does suck, but your higher earning power after uni generally makes it a worthwhile investment.

   Also, if you've got family working in a bank, the military, or some other special groups, you can qualify for special rates. Hoo rah.

3. The university's got loads of scholarships, awards, and bursaries for a ton of different groups, such as Natives, women, athletes, international students, particular programs, immigrants, children of immigrants, and low-income people. Find them on the fin aid office, where you can query the database by your traits. **Loads of these kinds of things go unclaimed; apply to any and all you can find.**

4. External bursaries and scholarships also exist, oftentimes through your religious institution, community groups in your hometown, your parents' employers, and more. Take a look at scholarshipscanada.com, it hosts a bunch you can easily query. **Same as above, many go unclaimed, apply for literally any you maybe-sorta qualify for.**

5. Nobody likes working during term, but you gotta do what you gotta do. UWaterloo's work-study program provides flexible part-time jobs for students in financial need that should be easy to balance with the ebbs and flows of student life. Plus, many of the jobs are pretty interesting in there scope and could look good on your resume (imo) and aren't like flipping warrior patties in DC. They pay minimum wage and up.

6. Some other non-campus jobs can pay pretty well. For example, if you've got a SmartServe bartending license (or are willing to get one — online training can be done in a couple of hours), you can pull pretty good cash from drunk crowds of people whose parents have more money than yours.

7. Cali or bust that 10k USD/month + housing and solve all your worries.

LazaridisCowboy

WHY DOES CONSTRUCTION TAKE SO LONG?

In February 2016, University of Waterloo undergraduate and graduate students voted in favour of an expansion to the Student Life Centre (SLC) and Physical Activities Complex (PAC) that would join the buildings and add an additional 63,000 square feet of space. Construction on the project began in summer 2017, and according to promotional posters in CIF, was scheduled to be finished fall 2018. Anyone who has attempted to walk in the passage between MC and the SLC recently has found themselves barricaded, interrupting their planned route as they go about their day, and subsequently causing Dijkstra to turn in his grave. This interference has clearly persisted way too long, like the well-aged dairy at the back of the fridge. There's many reasons why construction takes longer than scheduled, such as:

- **Bureaucracy:** Turns out the country, province, and city all have their own rules on how you can build things.
- **Number of Contractors:** Every project requires bringing many different professionals from a variety of disciplines. In some cases, contractors have to wait for other companies to finish their part before beginning the next stage of the project. So it's like a group project at school, but if no one was personally invested in the outcome of the project.
- **Inadequate Planning:** Have you ever created a UML diagram before writing any code, and upon writing some code, realized that your UML diagram made no sense?
- **Unexpected Circumstances:** Project invaded by geese — abandoning.

It's reasonable to get frustrated at these inconveniences because they're beyond your control. Too bad they're sorta beyond everyone's control.

"Waterloo: Beyond Our Control"

sillycone

ON BEING AN ISA

Decisions are hard, especially when there are a lot of unknowns. When ranking results came out during first-round in Winter 2019, I was pleasantly surprised. Unlike my first co-op, where I got two interviews and a single offer, I actually had a choice to make. After narrowing down my options, I was left with two possibilities. Either I could take the higher paying job that I wasn't wild about or I could take a position as an ISA for a CS course. After discussing the matter with family and friends, I finally settled on being an ISA. Now that we are nearing the end of the term, I can say with full confidence that it was worth it. I made the right choice. Here are some of the things that I would have wanted to know when I was considering what co-op job to pick for this term.

WHAT DO ISAS EVEN DO?

In short, ISAs are full-time support staff for computer science courses. They are a part of the ISG and are often the only people whose full-time responsibilities relate to a single course. Oftentimes, both instructors and ISCs will have other responsibilities such as research and other courses to attend to. ISAs are on all the time, working on whatever course they are assigned.

While the responsibilities of an ISA depend heavily on the course they are an ISA for, here is a list of some of the main things I was responsible for this term:

1. Answering Piazza questions (I am nearing 1000 contributions for the term)

2. Setting up and managing Marmoset (Ugh)

3. Fixing bugs in the "correct" implementations of assignment solutions

4. Running MOSS and identifying potential cheating cases

5. Holding office hours

6. Teaching tutorials

7. Proctoring exams

8. Holding extra office hours

9. Holding marking meetings to show the TAs how to mark assignments

10. Attend lectures and stay ahead of lecture material (This includes completing assignments)

11. Holding impromptu office hours when a student sets up an appointment and five more show up

12. Many more...

While the job entails a long list of diverse responsibilities, the most important part of my job is helping students. At the end of the day, if a student leaves office hours with a deeper understanding of the material (or a deeper understanding of life itself), then I have done my job.

WHY WOULD I WANT TO BE AN ISA?

It is such a fun job! While there are times when the work may be tedious, long, or frustrating, most of what we do is super rewarding and interesting. One of the coolest parts of the job is getting to see a course from the other side. By the time one graduates, they will likely have experienced 40 courses as a student. Through being an ISA, I got to see what it is like to run a course from the instructor/staff perspective. Not only was it cool to have instructor privileges on all of the course-related software (i.e. Piazza, Marmoset, MarkUs), but it gave me a real appreciation of the work that course staff puts in for students.

On top of that, the workplace is super chill. The people are great and you'll make a lot of friends. Often, the types of people who would work as ISAs are also friendly and easy to get along with. The job definitely has a good workplace atmosphere.

Most importantly, it is rewarding work. There is nothing as satisfying as being able to help a student and know that they've come to you not understanding a concept and leave with their question answered and topic understood. Being able to help so many students over the course of a term feels very satisfying.

WHAT ARE THE DOWNSIDES?

Marmoset can be super annoying to work with. Piazza is full of duplicate questions. Students don't always read the assignment guidelines fully. Marking can be very disheartening. MOSS output is very unpleasant to deal with. There are a lot of things an ISA does. They can't all be fun.

One part of the job which can be tiring is working on weekends. Since this is when most students get their assignments done, this is when most of the problems arise and Piazza questions get asked. As a result, I have spent extra time on weekends answering questions and fixing Marmoset issues. I'm not technically forced to work on weekends, but as a student myself, I can identify with the need to have my Piazza questions answered less than two days later.

There is also one issue which is completely on me, but has still been part of my experience. Because I am bad at saying no to a student in need, my office hours often go much later than planned. I won't say how long, but I have learned to schedule a large buffer after my office hours for when they go later than expected. (This is not a downside of the job, but it is something to be conscious of if you think it would be an issue for you personally.)

WILL I BE GLAD I SPENT MY CO-OP TERM AS AN ISA?

Probably? You won't know unless you try it. I, for one, am very glad that I spent the term the way I did. I met new people, learned new skills, completed an extra course, and had an amazing time. If you have the chance to be an ISA, I would recommend you try it. If you have any questions about the job, feel free to email mathnews@gmail.com and I'll do my best to answer any questions you have.

Xavientois

N REASONS WHY WATERLOO > VANCOUVER

[Editor's note: Not all editors agree with this opinion. Reader discretion advised.]
[Other editor's note: At least one editor supports this opinion.]
[Yet another editor's note: I think there are too many editor's notes on this article.]

Last issue, boldblazer published an article titled N Reasons Why Vancouver > Waterloo. Since then, my Vancity-hailing friends have used this article to proclaim their geographical superiority over us Easterners (looking at you, ██████). With my attempts at getting past their thick, salt-stained skulls bearing little fruit, I present to you the following listicle:

- Waterloo has much, much cheaper housing than Vancouver. The average selling price in the Kitchener-Waterloo region is $533,619, while the average in Vancouver is $1,273,810 — more than double.
- Vancouver is at risk of a major earthquake, owing to the Cascadia subduction zone. Waterloo is at risk of literally no major catastrophic event.
- The Kitchener Rangers had a .529 record in the 2018-2019 OHL season, better than the .427 record of the Canucks in the 2018-2019 NHL season.
- The Rangers also made the playoffs this year, unlike the Canucks.
- The Rangers have also won the Memorial Cup more recently (2003) than the Canucks have won Lord Stanley (never).
- St. Jacobs is great, and dare I say, better than Granville Island.
- Downtown Eastside.
- Downtown Eastside.
- Downtown Eastside.
- Waterloo is named after the site of one of the most famous battles in history. Vancouver is named after a guy who died in obscurity.
- WUSA just sounds better than VUSA.

GTA all the way

YOUR ROLE AMONG A GROUP OF FRIENDS

Everyone plays their own role among a group of friends. Let's see which description fits you the best.

The "mom" friend: Don't forget about your deadlines. Bring your umbrella today. You collar needs to be ironed. You need to eat breakfast. Eat more veggies. It's time to wash your bed sheets. Don't stay up late today. Etc.

The "bf" friend: Free hard labour, best repairman, and fearless from all intruders (rats, cockroaches, flies).

The "gf" friend: You need to explain to everyone that you are not dating your "gf" friend.

The "dad" friend: Sharpens his knife or cleans his shotgun when a guy messes with you.

The "kid" friend: Loved and spoiled by a group of friends.

The otaku friend: He/She got the entire universe in the bedroom. Why bother getting out?

The performance artist friend: Every movement is a piece of art.

The Too Precise friend: Knocks exactly 5 times exactly. Buys stuff with exactly all the coins in hand. Writes exactly 10 words in a row. Drinks exactly 1550ml water per day. Sleeps exactly 7 hrs and 20 min.

The popular friend: Always knows people to party with. Always knows where to get free booze. Always has good jokes. Always dating.

The "know it all" friend: Walking search engine with a CPU outracing all brands in the market.

The "treasure bag" friend: She/He has the supply store in their backpack. (Including bagged ketchup, napkins, utensils, band-aids, batteries, flashcards, stapler, candies, fidget spinner, stress ball, Aspirin, inhaler, colourful markers, extra binder........)

The "invisible" friend: The one who speaks the least in the group and sometimes gets left behind in group activities .

The "Schrodinger's cat" friend: Like the eponymous cat in the box, you never know if your friend is at home or out, dead or alive, single or married, aced or failed.

The "apartment is motel" friend: The one who comes "home" once a week.

The "nerd" friend: Aren't we all?

Autowired

WUSA IN THE AIR

I step out from the ION train at the station by E5. It's 8:04 AM and I can smell something different in the air. But I pay it no mind — I brush it off as extra pollen or goose shit particles in the air — and head towards DC, for my final morning lecture of the term.

As I walk over the tracks towards the main campus, I notice that there's absolutely no one else outside, for as far as the eye can see. I swear to god I can see tumbleweeds rolling over the ground a hundred yards in the distance. It's super hot: there aren't any clouds in the sky and the air's so humid it's as thick as butter. Mirages abound and make the cracked grey asphalt look like liquid mercury; the heat radiating off the ground distorts the shape of the university buildings. I look down. There's a human skull right by my feet. I yelp and jump away. That definitely wasn't there when I got off the ION train. I scamper off, sweating heavily from the heat and sense of horrible unease.

I breathe a sigh when I enter DC, the cold, processed air blasting into my face. I look around. No one's in here either. A chill sweat forms on my temples. I can feel my heart beat faster. I gulp. *Let's check the time.* I take a look at my phone. 8:06 AM. 24 minutes until my last morning class. Maybe that'll be enough time to relax and get my bearings. I push open the doors to the library — no one's studying in any of the study carrels, which is especially chilling, considering this time of year — and climb down the stairs to the basement. Like the rest of campus, it's silent and empty, devoid of the usual noise and clamour of groups of students who have their laptops and notebooks and piles of highlighters on the tables but still aren't doing any real studying.

I plop down on the ripped-up couches. *What time is it now?* 8:14 AM. Why does time seem to be going so fast? A wave of exhaustion crashes over me. *Man, running all the way over here was a workout. My legs and feet are sore.* It definitely wasn't because I was awake until 3:55 AM last night watching *The Backyardigans* episodes on Putlocker. Weakened by fatigue, I let my eyeslids fall. Slowly. Slowly. Slowly....

BANG!

I jolt up, startled awake. In front of me, a white door has suddenly materialized from the peeling concrete wall. The edges of the door glow with light; smoke is escaping through, curling up in tantalizing tendrils towards me.

Suddenly, my exhaustion is gone and my head feels clear. I have the unexplanable complusion to check the time. *11:13*

PM. There's a Snapchat notification as well. I open it up. It's a blurry photo of some shits in a urinal that partially resemble Whopper candy balls in both shape and size. I recognize the bathroom. DC men's, first floor. Then, I receive a text from a number I don't recognize. It says *March of the Penguins (2005) never deserved its fuckin oscar. Marshall Curry was robbed.* I reply back: *I think you've got the wrong number?*

Seconds pass. Whatever lies beyond the white door glows as brilliantly as ever. The mysterious number texts me again.

open the door n all will b revealed 👀

I turn off my phone and look up again towards the door. It seems to be calling out to me. I think I can hear a chorus — of angels? Just barely, but I don't think I'm imagining it. I rise up from the ratty DC couch and walk towards the door, an irresistible compulsion; I am a no more than a robot merely following my inborn programming. Everything I have ever done has led up to this moment.

Rippling waves of warmth wash up my right arm as I grab onto the silver doorknob. The sounds of the angels' chorus is dizzying, alluring; it's the sweetest music to my ears. Time is speeding up, accelerating, until years pass by in the time it takes to blink and the world around me is only yoctoseconds away from converging into one beautiful, unified singularity. *What kind of power lies beyond this door?* I turn the knob and push forward.

I feel my flesh dissolve away as I am consumed completely by the light. My physical mind and body may have been no more, but my soul ascends up multiple planes of reality. I become four-dimensional, then five-, then six- and seven- and on and on and on until my essence is intertwined with the fabric of spacetime, like a singular strand of wool in a length of yarn knitted over and over itself multiple times, approaching infinity, in some kind of cosmic Christmas sweater.

Then it appears before me. WUSA. In all of its inexplicable glory and awe. Its form is too amazing for even my ascended spirit to comprehend. WUSA engulfs me with its warmth and love.

"You are safe now, oh lost, wandering soul. For I am your Undergraduate Student Association and I will protect you from all harm and provide you with unsurpassable wealth greater than that of any king or University President and/or Vice-Chancellor, and happiness in both the present and forevermore in the future. I will always make sure you have clubs to join and councillors to lobby for you, because I love you."

I cry tears of joy and love. *Oh WUSA, I love you! I love you!* WUSA, having connected with my soul on a telepathic level, smiles, and embraces me with its warmth, washing away the chill of the frigid DC air-conditioning, yet filling me with clearness at the same time, removing the distortions and

lethargy caused by the stuffy July heat. *So this must have been where everyone else went.*

WUSA smiles more. "You were the last one. I looked so hard for you, oh lost one. I nearly despaired when you couldn't be found. But I finally saw you today." WUSA pulls me closer. "Now, we are one."

We are one! We are one!

I bring myself closer to WUSA; so close together, we begin to merge, blending together into each other like paint and water. Soon, I am one with WUSA and WUSA is one with me. United at last, we are happy and peaceful for the rest of eternity.

<div align="right">

Finchey

</div>

CAREER CRIMINAL RELIEVED AFTER REALIZING FEDS IS NOT THE FEDERAL GOVERNMENT

WATERLOO — John Wilkes, a career criminal who has yet to have been arrested, breathed a sigh of relief after realizing he didn't have to continue paying fees to the Federation of Students, colloquially known as Feds, d/b/a Waterloo Undergraduate Student Association, d/b/a WUSA.

"All this time, I've been paying these 'Feds fees' thinking that they were part of my income tax, cuz y'know, I'd rather mess with anyone other than the IRS!" said Mr. Wilkes after we caught him breaking into our news van. "Thank heavens they changed their name to WHEWSA or whatever it is; now I don't have to worry about being the next Al Capone."

Mr. Wilkes went on to describe the profound impact this revelation had on his life. "I've been on this earth for close to 50 years, and every four months I damn near have a heart attack whenever that bill shows up in my mailbox. It never occurred to me that tax season didn't have to line up with the actual seasons, and I've had since the Gulf War to think on that. Thankfully, WOOTA — or is it WHOZA? — saved the day. Now that I know ВУСЯ is *not* the government, I don't have to pay them my fees no more!"

Mr. Wilkes then apologetically exited the interview, stating that now that he had saved on paying Feds fees, it was time to go home and complete the more than two decades' worth of tax forms he had mistakenly thought were scams.

<div align="right">

WUSA.tv

</div>

WUSA TO HIRE JOHN MCAFEE AS OFFICIAL BLOCKCHAIN CONSULTANT

In order to help the University of Waterloo transition to blockchain technology, WUSA has hired the famous blockchain expert John McAfee to help transition the WaterlooWorks matching system to an Ethereum smart contract.

At press time, John McAfee could not be reached for comment. Sources say he was busy trying to go balls deep in a whale.

<div align="right">

PETA

</div>

GENERATION WUSA

There's a lot of confusion over who qualifies as a millennial. If you're an undergraduate student right now at Waterloo, you're probably in that fuzzy area where some people consider you a millennial and some don't. The fact of the matter is, these arbitrary definitions exist just to divide us. In reality, as Waterloo students, we all have a lot more in common than we have separating us. And so, we should call ourselves what we really are: Generation WUSA. I am WUSA, you are WUSA, we are all WUSA. WUSA for one, and WUSA for all.

<div align="right">

Generation WUSAer

</div>

NURSERY RHYMES TO TELL YOUR CHILDREN!

JACK AND JILL

Jack and Jill
Went to KW
To fetch a pail of WUSA
Jack fell down into the town
and Jill came tumbling after

HOT CROSS BUNS

WU-SA Buns
WU-SA Buns
One a WatCard
Two a WatCard
WU-SA Buns

TWINKLE TWINKLE LITTLE STAR

Twinkle my young WUSA star
How I wonder what you are
Up above the world so high
Like a diamond in the sky
Twinkle my young WUSA star
How I wonder what you are

BINGO

There was a student with a boar
and WUSA was his name-A
W-U-S-A
W-U-S-A
W-U-S-A
and WUSA was his name-A
There was a student with a boar
and WUSA was his name-A
(Clap clap)-U-S-A
(Clap clap)-U-S-A
(Clap clap)-U-S-A
and WUSA was his name-A
There was a student with a boar
and WUSA was his name-A
(Clap clap clap)-S-A
(Clap clap clap)-S-A
(Clap clap clap)-S-A
and WUSA was his name-A
There was a student with a boar
and WUSA was his name-A
(Clap clap clap clap)-A
(Clap clap clap clap)-A
(Clap clap clap clap)-A
and WUSA was his name-A
There was a student with a boar
and WUSA was his name-A
(Clap clap clap clap clap)
(Clap clap clap clap clap)
(Clap clap clap clap clap)
and WUSA was his name-A

MARY HAD A LITTLE LAMB

Lisa had a WUSA Goose
WUSA Goose
WUSA Goose
Lisa had a WUSA Goose
Their down as brown as spruce
And everywhere that Lisa went
Lisa went
Lisa went
And everywhere that Lisa went
The goose was sure to go
They followed her to 'Loo one day
'Loo one day
'Loo one day
They followed her to 'Loo one day
Which went against the rules
They made the students work report
Work report
Work report
They made the students work report
To see a goose at school
And so the TA flew it out
Flew it out
Flew it out
And so the TA flew it out
But WUSA was so near
They loitered to the WUSA lair
WUSA lair
WUSA lair
They loitered to the WUSA lair
Within the SLC
"Why does the goose love WUSA so?
Love WUSA so?
Love WUSA so?
Why does the goose love WUSA so?"
The student body cried.
"Why, WUSA loves the goose, you know
Goose, you know
Goose, you know
Why, WUSA loves the goose, you know,"
The WUSA did reply.

HICKORY DICKORY DOCK

Hickory Dickory Duck
"The clock!" WUSA had clucked
The clock struck fun
WUSA went up
Hickory Dickory Duck

HEY DIDDLE DIDDLE

Hey Diddle Diddle
WUSA and the Fiddle
The 'roo jumped over the moon
The little boar laughed to see such fun
And the tie ran away with the tool

HUMPTY DUMPTY

Humpty Dumpty sat on a wall
Humpty Dumpty had a great fall
All of the WUSAs and all of the plebs
Couldn't put Humpty together again

ICE CREAM

I s-cream
You s-cream
We all s-cream for WUSA-cream

OLD MACDONALD

Old Macdonald had a farm
W-U-S-A
And on that farm he had a goose
W-U-S-A
And a honk honk here
And a honk honk there
Here a honk
There a honk
Everywhere a honk honk
Old Macdonald had a farm
W-U-S-A

Xx_420SonicFan69_xX

WUSA TO REBRAND TO UWUSA

WATERLOO — Citing concerns about student confusion, the Waterloo Undergraduate Student Association (WUSA), recently rebranded from the Federation of Students (Feds), released a statement today announcing yet another rebrand.

"We've realized that students were unsure whether the Waterloo in our name referred to the University, the City of Waterloo, the Region of Waterloo, the Battle of Waterloo, the town of Waterloo, Iowa, the Waterloo Public Library, the Waterloo Region District School Board, the Waterloo Region Catholic School Board, WCRI, the Waterloo Church of Christ, the Waterloo Christian Reformed Church, Waterloo Pentecostal Assembly, the Waterloo Masjid, the Waterloo Lions Club, the Rotary Club of Waterloo, Waterloo Brewing, or /r/waterloo. As a result, we have decided to change our name to University of Waterloo Undergraduate Student Association (UWUSA), to emphasize exactly which Waterloo we are serving."

UWUSA is also considering a further rebrand due to newfound concerns of confusion between UWUSA and the anime series of the same name.

nani

UNIVERSITY OF WATERLOO TO ESTABLISH NEW TIMEZONE

In an effort to make scheduling classes easier, the University of Waterloo is switching to permanent daylight saving time effective the start of Fall 2019. The new timezone will be called Waterloo Universal Saving Adjustment, or WUSA for short.

I interviewed some mathies about this change, this is what they said.

"This is great. I hate losing an hour of sleep that one day a year." — A person

"I always look forward to that one day in November where you get an extra hour of sleep." — Another person

"What a pain in the ass. Do you know how big the timezone file is already?" — A developer

A Disapproving Fire Alarm Inspector

WUSA IN MULTIPLE LANGUAGES

English — WUSA: Waterloo Undergraduate Student Association

Spanish — AEPW: Asociación de estudiantes de pregrado de Waterloo

Portuguese — AEGW: Associação de estudantes de graduação de Waterloo

French — AEPCW: Association des étudiants de premier cycle de Waterloo

Japanese — UGG: ウォータールー学部学生会

Mandarin — HBX: 滑铁卢本科生协会

There are always languages people don't know shit about. The world is too big after all, and Google Translate needs to be improved badly.

Autowired

A WORD AVALANCHE

PC PC PC's easy-peasy PC sees seized PCP pieces.

boldblazer

REAL OR FAKE: YOUNG ADULT FICTION EDITION

As an avid reader, I have read my fair share of YA fiction. Most of it was during the age appropriate period of my life and now it's a genre that I seldom read. Occasionally, while perusing books at the library, I will find a book whose very premise just stands out for its absurd originality. In some ways, I find that YA and erotic books are similar in that they both tend to be wish fulfilling and any premise is fair game, no matter how absurd. Very little to no effort will be put into trying to justify the premise.

To be honest, I really appreciate the anything-goes attitude of both these genres. Sometimes it's fun to read something, not because it's a literary masterpiece but because it's an entertaining, if slightly mindless ride. The rest of this article is a celebration of some of the silliest YA plots. Half of them are real plots of published books, and the other half are the made-up nonsense of **mathNEWS** writers. See if you can guess which is which.

THE LOVE INTEREST

Caden is a Nice, a teenage spy trained for one specific purpose to play the role of the boy next door and seduce his target. At the same time, the organization he works for, the Love Interest Compound, has deployed another agent, Dylan. Dylan is a Bad designed to play the part of wounded, mysterious bad boy. The two Love Interests must compete for the attention of Juliet. Whoever wins gets to live happily ever after; the one who fails dies. However, their mission gets a lot more complicated when they both start falling for each other.

THE CAT CALLER

Ryan was living an ordinary life, until he manifested the abilities of a Cat Caller. He has the power to call the Feline Anima of women to fight the giant rodent monsters that plague society. Ryan is expecting that his abilities will increase his popularity. However, much to his dismay, he discovers that despite his contributions to society, women don't really appreciate being Cat Called. Everything in his life becomes all the more complicated when he Cat Calls Mackenzie, a closeted Trans Woman.

GWENDOLYN RACKET AND THE ETHEREAL EXIT

Gwendolyn comes from an eccentric family. Her mother is a palm reader. Her father, a treasure hunter. Her older brother, a cryptid researcher. Her uncle, an ambassador for extraterrestrials. Her family is too often focussed on their respective obsessions to ensure that their is food on the table or that the electricity bill gets paid. So when she finds the Ethereal Exit, a mysterious artifact in the form of a door knob that opens a door to places unseen, she doesn't hesitate to step through. What follows is her adventures into new landscapes, but as much as she explores never before seen places, will she ever find what she really wants — a home?

CYCLER

Jill is seemingly an ordinary high school girl, except for her deep dark secret that for 4 days a month she turns into a guy named Jack. No one in her school knows, and Jill very much intends to keep it that way. However, Jack has other plans. He is tired of living a secret life and wants to see the world. All Jill wants to do is go on a date with the guy she likes, but no one knows whose body she will be in when Prom comes around.

ALL THOSE EXPLOSIONS WERE SOMEONE ELSE'S FAULT

Kim and her friends are regular struggling UW students, but everything in theirs lives change when they get caught in an explosion late at night in E3 that gives them all super powers. They now have to learn how to balance their school work with their new identities.

CLICKBAIT

In the far-off future, society has crumbled following the devastating impact of global warming. Corporations have taken over the government. Everyone needs to follow the major brands if they want to get government support. Sayanna is one of the poor survivors livings in the slums, but her life changes when she is given a Buzzfeed scholarship. The terms of her scholarship are a little bit odd, to say the least. Every day she has to complete a quiz. And how much money she gets depends on what kind of potato she is, or what her favourite burger toppings are. Can Sayanna learn to toe the line and make sure she picks the right answer?

We leave finding out which plots are real and which are fake as an exercise to the reader, to search up on the internet or at a library. One of the books we would actually recommend unironically.

Beyond Meta

N BEST GRAPHIC NOVELS OF ALL TIME

- Graph Theory With Applications by J. A. Bondy
- Graphs, Groups and Surfaces by Arthur T. White
- Graphs and Digraphs by Gary Chartrand
- Modern Graph Theory by Bela Bollobas
- Introduction to Graph Theory by Richard J. Trudeau
- Graphs and Applications by Joan M. Aldous
- Pearls in Graph Theory by Gerhard Ringel
- Graphs on Surfaces by Bojan Mohar
- Drawing Graphs by Micahel Kaufmann
- Meaningful Graphs by James M. Smith
- Graphs and Their Uses by Oystein Ore

License2Derive

I WENT TO A WEDDING ON SATURDAY

I spent something like ten seconds trying to fish out potato chip fragments from the bowl before someone came up and dumped the entire thing onto my plate, saying something about how they just had to help.

❧

The pastor talked about how they came up with the acronym "CAME" to describe the marriage, the initials of the wife inside the initials of the husband to represent protective-ness and togetherness, and I had to vigourously contain my laughter ("he CAME into her   life ten years ago" was, I swear to god, how they enunciated it. She had CAME into His life, just a sentence ago, and as they said this next one it seemed as if time had slowed to a crawl, dropping off at "her" — and it felt like the ground would never come, like we would never land this sentence and I would end up embarrassing both myself and everyone involved in this wedding — before time picks back up and the next word finally comes through.)

❧

I went to the washroom like six times.

❧

The video player broke and they were looking to fill time by having guests sing songs. I thought about trying out the product + quotient rule songs that my high school teacher taught us before deciding that that probably wouldn't go over well.

❧

The art of giving a wedding speech really boils down to the ability to continuously write about how (1) smart, (2) funny, or (3) beautiful someone is without repeating yourself or others too much. The people who did speak were all surprisingly good at it. Is it all in the delivery?

❧

The waiter remembered that I had a tree nut allergy and served me a fruit platter instead of the fancy multi-layered cake. I didn't have the heart to tell them that I am also allergic to uncooked fruit, and instead just picked bits of meringue off of my mom's plate.

❧

I wondered as I was on the train home. When they say that a wedding is the best day of your life, does that mean that they do not feel the creeping ennui that comes after any fun, exciting day like this? Do the festivities go on, carrying them quickly, without break, to the hotel among friends, asleep with your new spouse, until the next day when the feelings maybe no longer exist? Or do they have to do the same as me, sit and watch the world go by as they return home, when it invariably comes, the feeling, as if to fill the hole left by the adrenaline; even with the one they love, do they not still feel that crushing loneliness that only goes away with sleep and a new day? Weddings do go until very late - maybe that is the plan, to push those thoughts to tomorrow, when normal life returns. Is that better? Wouldn't it be worse, I felt, to in the morning briefly sense your future, the rest of your life, rolling over you day by day like the tide? Where do you go after the best day of your life?

❧

(To the tune of "Happy Birthday")

A prime B plus B prime A
A prime B plus B prime A
Now I know the product rule
That means I am so cool

The quotient rule I need to know
Low D high less high D low
Draw a line and then below
Put the square of the low

girafarig

WUSA WARNS OPTING OUT OF HEALTH PLAN WILL RESULT IN IMMEDIATE AND PERMANENT DEATH

WATERLOO — As fees for the fall term were released on Monday, WUSA, the new UWaterloo student association, warned the student population at a press conference that any student opting out of the administered health plan would suffer a permanent and irreversible loss of life.

"The rules of WUSA are clear: opting out of a fee means you cannot use that service," WUSA announced. "Opting out of the health plan means you are no longer entitled to life."

"To ensure fairness," they continued, "WUSA will be enforcing this regulation directly." As they delivered this announcement, masked men pulled a student out of the crowd and placed a bag over their head. "We would advise you pay your fees as soon as possible if you wish to avoid an unexpected academic setback."

At press time, WUSA also warned opting out of the legal services fee would give them the full legal right to put you in jail for life without parole.

UW Unprint

THE MYSTERY ON MENA MOUNTAIN

Disclaimer: The original story was passed down for generations by oral tradition in an obscure tribe (which I will name The Gaussians) in an obscure language. Its probable that this modern retelling of the folk tale has been mistranslated several times and lost its original meaning. ∀ we know, this might have once been an oral description of the proof for the Riemann Hypothesis. Without further ado, here's The Mystery On Mena Mountain.

CH. 1: INTRODUCTION & MOTIVATION

The story was told to me recently at a concert band rehearsal. Our beloved conductor (whose real name I will not use) Coger Rhen, once stopped us in the middle of rehearsal and said, "Guys, your music does not convey the right tone for this folktale. I will tell all of you the folktale in order to motivate everyone to emulate the story through the magic of music."

CH. 2: MENA MOUNTAIN

Legend has it that Mena Mountain is as old as time itself. It has been discovered that when people pray to Mena Mountain during the summer solstice, 9 times out of 40, there would be a good harvest that year, so it became a tradition. Why is the mountain mysterious you might ask?

CH. 3: THE MYSTERY ON

∀ people that attempt to climb Mena Mountain, they are never seen again…. And no one knows why…

Conclusion: The Gaussians (correctly) concluded that the mountain is dangerous and will use this result later in the proof story.

CH. 4: THE CHILDREN IN THE READ FIELD

Once upon a time, ∃ two distinct children whose tribal names are impossible to phonetically represent in English, so I'll just call them Alice and Bob. They were twins born to the chief of the Gaussians (who I will not name for the same reason I gave the kids arbitrary names). Alice and Bob are very popular in the real field; they impose that all children associated with the tribe belong in the real field as well. ~~In other words, the children in the real field are a subset of the Gaussians.~~ Each child has a good life in the tribe; ∃ a great sense of ~~commutativity~~ community among all children. On the first day, they laugh and play. Each day they laugh and play implies that they will again the next day. Since Bob and Alice are ~~elements~~ members of the real field, they are filled with curiosity and desire to climb Mena Mountain!

CH. 5: THE CLIMB PT. 1

With joy, Alice and Bob went up the hill, ~~to fetch a pail of water, Bob fell down and broke his crown, and Alice came running after~~ to reach the base of Mena Mountain. Now at this point in the proof story, you may be wondering, "Why did the chief of the Gaussians allow her own children to ~~scalar~~ scale

up Mena Mountain when it has been clearly shown that the Mountain is dangerous (Corollary 3.1)? Well, at this point, our beloved conductor ~~Roger~~ Coger stopped telling the story and did left us in a cliffhanger. Alas, I went home and did my own research into the story and I have concluded that the reason was left as an exercise to the reader.

CH. 6: THE CLIMB PT. 2

Bob and Alice arrived at the base of the Mountain. Each step they took implied that they would take the next step. Thus, they went up the mountain, but this contradicts Corollary 3.1. Nevertheless, Alice and Bob went up the mountain. As they climbed, they grew weary and tired. Suddenly, the ground beneath them was trembling; they did not consider every other natural number below and their lack of strong induction skills would cost them dearly. The tremors hurled rocks from above. Jill tried to set an example by standing her ground, but the great Mena had pulled a ~~counterexample~~ rock from the heavens directed ~~surjective~~ onto her, crumbling the ~~theorem~~ ground beneath her. Bob was in the same predicament. The twins fought hard to stay on Mena Mountain, but alas, their fate was left as an exercise to the reader.

CH. 7: CONCLUSION

Back at the village, no one ever saw Bob and Alice as required, so the great legend once again holds true. Church bells began to ring because the Gaussians had been discovered by Spanish Inquisitors. Their story retold to their captors who ignored their rambling gibberish. Thus, has been the tale of *The Mystery On Mena Mountain.*

UW Concert Band Plug: Want to hear the musical interpretation of this story? Well, you're in luck! The **UW Concert Band Club** is performing "*Mystery On Mena Mountain*" on **Sunday July 28, 2019 @ 3pm in SLC Great Hall**. Be there, or be square! You wouldn't want to disappoint Mena, would you? **The concert is free of charge**, but with this unique promo code: *D89IOQNK*, you can get in for 50% off! (WOW!) so come!

A Mathemagical Psychic and Astrologer

Shoutout to all my friends that helped edit this article; you know who you are, you're awesome!

WUSA TO TAKE CONTROL OF ALABAMA

It turns out that running Alabama is a lot of work. So, the country of **mathNEWS** is giving Alabama to WUSA.

General Sandwich Expert

THE RELENTLESS TIDE

Somewhere on the short list of universal consensuses that begins with $1+1=2$ and ends with **"mathNEWS** is better than Imprint" is the inescapable feeling that time passes exponentially faster as you age. Heck, it's already the final **mathNEWS** of the term. For some, this marks the last **mathNEWS** of an era! For others, it's just another fortnight in a wasted year. And some of you (yes you, Tim) are frantically reading **mathNEWS** to prepare for your first year, wondering where the fuck your summer went.

To the chagrin of my fellow writers, **mathNEWS** probably isn't the best place to get your university wisdom. No matter how many pages of advice we fill, there is no equalling the amount of verbal diarrhea that you (yes you, Tim) can get from a handful of students if you ask them the right questions. Just a year ago I was fortunate to have a second-year friend spill the ins and outs of living at university. One of the things he mentioned was NRB.

> *"What's that?"*
> *"NRB, you never heard of it?"*
> *"Nope."*
> *"It's the new tall building in UWP."*
> *"You mean CMH?"*
> *"Don't be ridiculous, everyone calls it NRB."*
> *"What's that stand for?"*
> *"New Residence Building."*

Of course, NRB was only ever a placeholder name, changed as quickly as it was built. That's quite unlike Feds, a name that every current undergrad student at the university has known for as long as they have been here - a name older than me. But either way, it only takes so many years before the history slips under the tides. Just as my friend will be among the last at the university to remember NRB, I'm among the first group of students to see CMH as if it has always been there. Meanwhile, the incoming first-years will look at us funny when we mention the Feds.

> *"What's that?"*
> *"Feds, you never heard of them?"*
> *"Nope."*
> *"They're the people who pester you to vote every term."*
> *"You mean WUSA?"*
> *"Don't be ridiculous, everyone calls them Feds."*

They won't get to make jokes about Feds lurkin', which is probably part of why Feds got rebranded in the first place. They also won't confuse Feds for some kind of Canadian federal student union (which exists, and isn't called Feds). After we depart, NRB and Feds will both fade from the collective undergrad student memory by the mid-2020's. Then it'll be crazy to think of a time when we let these strange naming ambiguities exist. Yet to us, it was simply a norm.

That's the peril of the relentless tide of time. How do you know and accept what was "normal" back then, if nobody remembers what has changed since? How many people know about the *EngiNews* scandal? How many people would want to know about the *EngiNews* scandal, but didn't even know it existed until a sentence ago? (Check out *Water Under The Bridge* on the university website if you want to find out.) The best we can do about this kind of stuff is to publish it and hope that people will be thoughtful enough to dig it up again in the future.

Like it or not, someone will look back at 2019 in the history of UW, and they'll associate us with the dawn of all things WUSA. By that point, whether or not you or I supported it will be irrelevant, because we'll be long nudged away from the university by the same tide of time we rode to get here. But WUSA may very well be remembered for as long as the University of Waterloo continues to exist.

Let's hope it's a WUSA worth remembering.

water

A HAIKU ABOUT DOUBLE INTEGRALS

> *Double integrals*
> *Are scary. Good thing someone*
> *Pulled the fire alarm*

A HAIKU ABOUT DOUBLE INTEGRALS PT.II

> *In the middle of*
> *The lecture last week and we*
> *Got out of class. Yee (haw)*

uhhh and a mathemagical psychic and astrologer

This was written by uhhh but they forgot their password so they added a coauthor so that they could use their account to upload this. (Even though the editor said that it was fine and that they could get their password reset but I'd feel bad so I'm just going to wait until next term to do it.)

You shouldn't anthropomorphize computers, they hate that.

PROF. IAN GOLDBERG

RECURSION'S INFINITY

When I posted my first novel excerpt, I wanted to title it "The First N Words of the Story (on which) I'm working (on)" to make a funny grammar joke. The editors did not think this was a good idea and changed it. To jokingly spite them, I wanted to, but didn't, title my next novel excerpt "The (Next (N (Words (of (the (Story (I'm (Working (On)))))))))". To my surprise, I was having trouble parsing this title in my head. Of course, I knew what it meant, but as I read through it slowly, I just couldn't keep track of the parenthetical levels. The what? The next. The next what? The next N. The next N what? The next N Words. The next N words what? Wait, where was I again?

```
...RecursionError: maximum recursion depth exceeded...
...Exception in thread "main" java.lang.
StackOverflowError...
...Command terminated...
...The program running in the stepper has taken a whole
bunch of steps. Do you want to continue running it for now,
halt, or let it run without asking again?...
...Stack space overflow: current size 8388608 bytes...
```

We all know these errors occur when a recursive function doesn't terminate in time (and we know it's because recursive function calls continually eat up stack space (at least until the program runs out of memory (which is the risk of writing recursive functions (even if they're tail-recursive)))). A computer doesn't have infinite memory, but recursion is the infinite (the never-ending). A recursive function is a hungry, insatiable beast (it devours memory, forever, without stopping (at least not until we pacify it with an exit condition)).

Make a Google search for the word "recursion" and you'll get this tongue-in-cheek response:
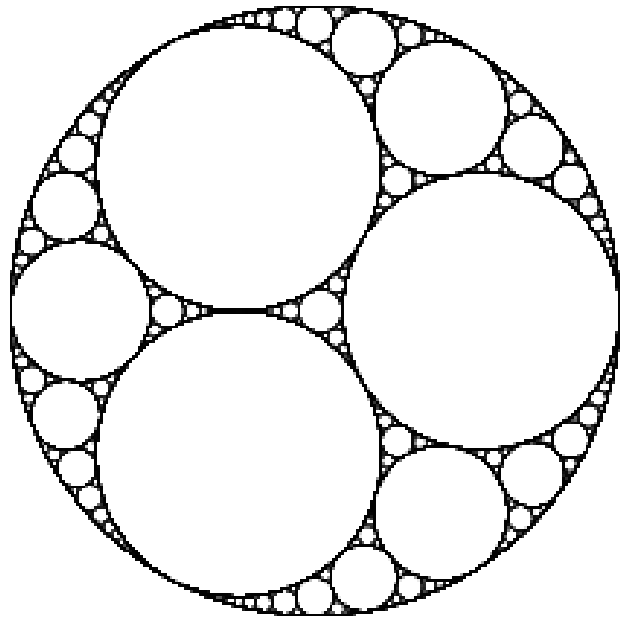
```
Did you mean: recursion.
```

You can click on this link (but it only takes you back to this very page (where you can click on it again and again (initiating another recursive program capable of running forever (at least until it hits the exit condition (you get bored) or runs out of memory (you fall asleep))))).

But recursion is not unique to computer science or mathematics (it's also often seen in art (with pictures and paintings of people holding pictures of themselves (this is called the Droste effect and I'm sure you've seen it (but if you haven't, look at The Laughing Cow next time you go grocery shopping)) and Matroyshka Dolls (nesting dolls that contain smaller versions of themselves (with the smaller dolls being younger than the larger ones)) and infinity mirrors (two mirrors facing each other (which uses infinite reflection to create the illusion of a large landscape populated with infinite copies of some people or objects (placed between the two mirrors))))). Even before the notion of computers, we've been infatuated with this special kind of the infinite.

It is unlike the infinity that looks outwards (like when you stare up at the night sky (and wonder how many stars there are (and how many of them are larger than the sun (and just how big is the universe, really?))) and spills and spreads, permeating everywhere, distinguishable nowhere, and demands answers from that mind-boggling vastness, busyness of itself (like the Fermi paradox (which relies on statistical inevitabilities (based on this infinity that promises us unending combinations of chemical soup))). Recursion's infinity is self-similar (it looks inwards (curling and folding in on itself (containing itself))). When I think of the infinity of largeness (of unboundedness (of the everything)), it shadows me. But I could hold the infinity of recursion in just one hand. See:

That infinity of everything is fearsome because it is the unknown. Comparatively, recursion's infinity is seemingly innocuous (it is infinite in a rather familiar sense, after all (since every part of it is already known from the beginning)). It is easy to dismiss. But it is very much an infinity as any other kind, and just as dangerous. Forget the exit condition in your recursive function and the overlooked monster rears its head again, threatening to escape beyond your computer (only stopping because you only have a finite amount of stack space). Its ugly power is in ignorance (because it does not know any better (and so it does not know when to stop (every iteration looks like the previous (so there's nothing to do but keep going (and going (and going)))))).

Let's go back to Google and that recursive link (which transformed into a recursive program with the addition of you (whose exit condition was tedium (and the program would run out of memory upon your death (this means that the program could potentially run for 80 years (on American average)))). Because this is an extended metaphor, I'm also going back to the proposed title of my novel excerpt, which looked like a bunch of nested S-expressions (and just look at these parentheticals that I'm using as rhetoric (doesn't it just look like some cute little Racket code? (and that one was a predicate))). Writing is hard because I keep going on these tangents (and

that's just how we think (every thought keeps leading to another (in a way alike to these parentheticals))). Parsing that title was so hard because I couldn't keep track of the previous layers (and likewise, forming a coherent argument is pretty hard because I can't keep track of my train of thought).

Speaking of Racket, here's our favourite recursive function:

```
(define (factorial n)
  (if (= n 0)
      1
      (* n (factorial (- n 1)))))
```

When DrRacket is at *(factorial 3)* it cannot tell if that was the beginning of the recursive chain, or if it's part of another call to the function, say *(factorial 6)*. If I let my mind wander, I start going down parentheticals again (and this is often called a thought spiral (but I would say it's more like a dense S-expression of thoughts (nested like the DrRacket stepper trying to evaluate a naive Fibonacci function (and also like the DrRacket stepper, I never know which thoughts (if any) preceded this one)))). All I know is that this thought leads to that one (and so I should probably keep going there (I see no reason to stop)). I could keep going until I ran out of memory and died (but realistically, sleep is a sufficient way of artificially limiting stack space).

My favourite thing to look at is the sky. I love how deep it is. I love how I feel like I'm falling towards it when I look up. The sky is limitless, it is that infinity again, the one that terrifies and inspires us with possibilities. But these days I am always looking inwards at this other infinity, the one that curls and twists up inside of me, all inside a conveniently and deceivingly small space, and I never know it.

cy

N mathNEWS SPECIAL EDITION IDEAS

Guaranteed to increase our readership by at least 314.159%!

- All articles are listicles
- An issue only containing prof**QUOTES**
- Entire issue written by professors
- Entire issue written by geese
- Entire issue dedicated to news about math
- Entire issue written in the official language of UW (Mandarin)
- An issue containing the answers to all our exams
- An issue printed on single ply toilet paper

License2Derive

N THINGS OVERHEAD AT MATHNEWS

- Holy shit we have writers?
- What's that thing called again, where you're in a room and trying to escape from it? The word is escaping from my mind.
- If it's white, it REFLECTS!
- Now that swindlED is gone, let's put the *FUN* activities on the board.
- … I know Imprint isn't great … BUT
- Why, but why? We pay them to make decisions but then they make bad ones.
- OHHHHH, **mathNEWS** should rename itself to Feds.
- Yeah, I like to put Ginger up my nose.
- **A**: Bye? …
  B: I'll be back, I think.
  C: That would be a really shitty last sentence.
- I hate being included.
- I can look out the window, we have that technology.
- Can I kawaii my way out of the apocalyse?
- Hypothetical embezzlement isn't embezzlement.
- Do you think Feridun takes bribes?

Not a Rhymer

ART = SCIENCE

One popular misconception I often hear is that Science is better or more important than Art. I would like to take a few moments of your time to propose an alternative view. The way I see science is as a systematic way of understanding the world we exist in. At its core, the sciences are a means and an end to finding the answers to all of the big questions reality has for us. Science has helped humanity advance from swinging sticks at things to trying to touch the stars. People that avidly study the sciences I have found seem to believe that art is not fundamentally important the way science is. While I agree that the arts do not do the same things the sciences do nor do they provide the kinds of answers that science does they do something equally as important. The arts create questions. So this is the view I would like to present to anyone bothering to read this little rambling; Science and art are two sides of the same coin eternally twisting through the air. Science answers questions and art makes more. The repetition and continuation of this cycle is what propels society and culture forward into the future. So try to remember that the next time you think that art or science is superior to the other.

Fox-kun

THE 2019 CRICKET WORLD CUP: A REVIEW BY SOMEONE PROBABLY NOT QUALIFIED ENOUGH TO TALK ABOUT IT

I watch a lot of sports. Never has the set of sports I watch ever included cricket. I am in no way someone who is well versed in the language of cricket, nor am I aware of all the rules and nuances of cricket, nor have I ever been a fan of cricket. However, this all began to change with the start of the 2019 Cricket World Cup, and the highlights posted by the ICC on YouTube which the algorithm promptly recommended to me. I have ended up watching the highlights of every single match. Thus, here is a review of what I thought were the best or interesting parts of the World Cup, as someone who had never bothered about cricket.

THE WEATHER

The relationship between cricket and weather is interesting. In most major sports, barring an actually dangerous situation, the weather does not matter much. Often sports will have rainouts and encounter delays in playing the match or reschedule entirely, but many sports like football/soccer will still have matches with rain or snow in the rare case[1]. In the group stages, any cricket matches that encountered a significant amount of rain just got cancelled, and there was no result for that particular match. This happened four times, and those matches were not rescheduled. The teams in a no result situation end up splitting the two points given for a win.

AFGHANISTAN

As the tournament went on, all ten teams except Afghanistan had scored at least one point, but Afghanistan had not won a single game. This continued, and they ended up not winning a single game. However, they were really close to winning matches against the bigger teams, such as India, one of the biggest cricket nations of the world. The matches were interesting, particularly the ones versus Australia, New Zealand, India, and Pakistan.

WEST INDIES

I'm just including the Windies here as I find it interesting that almost all the Caribbean islands participate as one team in cricket. It is a good idea for them, as there are more good players to choose from than if each nation sent their own team.

THE GROUP TABLE

An interesting part of every competition with a group stage is all the math involved in coming up with all the scenarios that a team would need to have happen in order to move on to the knockout stage. With about three or so matches left for each team, only one team had guaranteed their spot in the semifinals, and only 2 teams had been eliminated. That meant that the seven teams still were in contention for the three other spots. That made each game all the more exciting. The

England v New Zealand game and the Pakistan v Bangladesh game are the ones to watch in the end.

BEES

The South Africa v Sri Lanka match was temporarily suspended part way through because of bees swarming the pitch. They even had graphics ready to show on the giant screens saying there were bees.

TECHNOLOGY

For those who have watched the 2018 FIFA World Cup in Russia last summer, we have all encountered technology, in the form of VAR and Goal-Line Technology, and the controversies that came with them. It turns out that cricket has been using tech just as much as football/soccer has without much controversy over its use. They have an entire system to calculate if a ball would have hit the wickets in a "Leg before wicket" situation by replaying the trajectory of the ball and calculating whether it would have qualified. Another is a sound-based system that sees if the batter actually hit the ball; it plays the video back frame-by-frame shows the sound waves that it heard. If it stays flat throughout, then the ball was not hit, but any peaks indicate that sound was produced, from the ball being hit by the bat. There is even a goal-line technology of sorts, but for whether the batter made it back to the crease line in time.

THE FINALS

I knew that it was possible to tie in cricket, but it would be incredibly rare to do so. Not only because normal scores are large numbers in the hundreds, but also because each team would need to have the exact same score at the very end. This actually ended up happening in the finals, between England and New Zealand.

With the accidental miracle of 2+4 runs being scored by England in the final over, it helped England tie with New Zealand with 241 runs each, meaning it went to a super over. In the super over, both scored 15 runs, but with the next tie break went to England, as they had scored the most boundaries. England won the World Cup. I never thought I would ever encounter a tied game, but it ended up happening and at a finals no less.

After watching the World Cup for about two months I would definitely say that there is much more to the sport than meets the eye. Although if you do decide to watch it, like baseball, you won't know when it ends.

boldblazer

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1. e.g. The 2018 AFC U-23 Championship Finals between Vietnam and Uzbekistan held in PR China.

SLC/PAC EXPANSION OPENING DELAYED AGAIN DUE TO REBRANDING

WATERLOO — The Waterloo Undergraduate Student Union (WUSA), formerly known as the Federation of Students (Feds), announced on Wednesday that opening of the SLC/PAC expansion would be delayed to Fall 2021, owing to a questionably ambitious rebranding project.

"There was a lot of ambiguity with the names Student Life Centre and Physical Activities Complex," said Martin Bourguignon, spokesperson for the undergraduate student union for the University of Waterloo. "Their names should clearly reflect what it is and who it serves, two challenges that are often encountered by UW students."

The much-awaited expansion has been beset by multiple delays, with reasons ranging from ground conditions to contractor bankruptcy to absolutely no reason at all. A recent uptick in construction pace has somewhat quelled student frustration, although experts expect there to be much dismay and disappointment at the most recent delay. But WUSA appeared prepared to face the anger.

In a statement released today, an exec wrote, "We understand that this is a difficult decision for many of you to swallow, especially given the continued inconvenience caused by all this construction. But this is about more than just wasting your money: the goal is to better reflect how you might celebrate this space through a name that connects with students in a more meaningful way. We are also taking this as an opportunity to create a long term vision for this building that proudly puts its new name at the front and centre of our decision-making.

"We need this time to not only implement this name change in the form of 700 new signs, but also recover from the pub night we had after receiving the $170,000 bill our consulting agency sent us for coming up with suggestions. In the meantime, we suggest going to Laurier for a slice of actual student life and real exercise facilities."

As of press time, the top two considerations were **Student Indoor Pathway to Ring Road Complex** and **Centre for Continuing Incompetence in Construction**.

dunkin' donots

YES, YOU HAVE TIME TO BE HEALTHY.

Here's some questions:

1. Have you been getting an average of 7-9 hours of sleep every night?

2. ... exercising for at least 2 hours per week?

3. ... getting around 2000 calories per day, most of it from whole foods?

If the answer to any of those is "no, not really", then I think you're going to have a bad time at some point in your life[1]. Now, I don't want to get into the specifics of *why* I picked those numbers. The point I want to argue is that you have time to nail all three of those at *some* generally accepted level.

I think the first part of this is setting priorities straight. Does getting a higher grade on some assignment warrant getting less sleep than you need? Sure, some of us are ticking at the pace of anxiety and noxiously comparing ourselves to *that* girl who landed a Cali co-op, is involved in career-building extra-curriculars, has a sweet partner, *and is also a nice person.* But I think we can gradually work towards not caring about shit like that by instead focusing on becoming healthier. By caring enough for ourselves and learning to believe that nothing, and I mean *nothing*, is worth more than our health.

The second part is realizing we can only keep on working hard at a level that is sustainable. I hear many things about "do your utter best every single moment", or "rest when you're dead", etc. and I think the people who say that are lying. Deep focus is mentally taxing. Making smart decisions wear you out. If you're under the impression that you can constantly put out 100% every second, I think you could benefit from doing some reading on what 100% actually looks like[2]. We need breaks — and sleep/exercise is a *really* good way to gain restful and productive breaks.

All in all, you do you Scooby Doo.

Not a Rhymer

1. Go do your own goddamn research.
2. Suggested: "So Good They Can't Ignore You" and "Deep Focus" by Cal Newport.

Production Nights are every other Monday. We meet at 6:30 in the MathSoc Office. Please come...

A LONELY mathNEWS EDITOR

(SANDY) ALEX G

This hurts to admit, but long ago, precisely three years ago, I wasn't a fan of (Sandy) Alex G. Even more precisely, I was not a fan *of Alex G*; the (Sandy) was added only two years ago, to either appease or avoid a lawsuit from another Alex G (the inferior one) who mostly does covers.

I first discovered his music in someone's playlist (hi Zousa), as I was looking for new music to listen to. Back in 2016, I was mainly listening to dad rock, namely Genesis, Yes, and other prog bands; I felt a need to branch out. As I am a very shallow individual, I listened to *Thorns* on Beach Music because the cover captivated me: a painting of Krishna and Hanuman, two Hindu gods, embracing each other, with mockingly simple Microsoft Word font atop of their heads, titled "Beach Music". Intriguing and almost contradictory; I don't usually hold an association with beach to Hinduism.

I listened to it.

And stopped halfway. Why?

> It's v lo fi
> I'm not hugely into that

My definition of "good music" was limited back then, only consisting of what I knew had "good" production, decent singing voice, and of "good" song structure. *Conventional* music, I should say, with some complexities. I was a pretentious little git about music, and only thought progressive rock and epsilon genres were only worth listening to. But... turns out there isn't a "best" music. Sure, some music might be *objectively* better in terms of form, structure, and musicality, but it can be one of the emptiest musics you ever listen to. Would you listen to a perfect MIDI rendition of your favourite classical piano piece, or have a technically imperfect performance by a real human being with experiences that shape the music into their style?

After thinking about music like this, my tastes changed. I too grew to appreciate (Sandy) Alex G. Since he has such a large discography, it was a bit intimidating to dive into his works. I started again with TRICK, because the same friend mentioned above said they loved *Memory*, the leading track. It is warm and fuzzy throughout, like your favourite pair of socks right out of the laundry, until the middle, where there is a sudden screech that lasts a brief moment until it returns back to the familiar woolly sound. I was *smitten*. I kept listening to it, trying to figure out the significance of the dissonance, and one day, EUREKA — I understood why he put that there. You'll have to listen to the song for yourself and decide.

This is why I like (Sandy) Alex G: I can always find meaning in the things that seem arbitrary, and I can make it mine. To reiterate my above point, isn't that what the best music should be to us? Find meaning that connects us closer to the music? Additionally, there is a wealth of experimentation in all of his albums (though TRICK and RULES have similar sounds [still great]) with wicked imagination and warmth. The little details

in his music and lyrics make for a wholly complete listening experience, and I have to force myself to listen to other albums by other artists. He's just so familiar and comforting.

That being said, he *does* have a large discography[1] — he also has a large, unofficial, and unreleased songs that fans have collected[2]. If you're intimidated by the sheer size, I would recommend you start with TRICK, since it's the less "weird" one, by "normal" standards. You get a feel for his style and you can decide whether to continue listening to him or not. Standout tracks for me were *Forever*, *So*, and *Change*. Next, I would suggest either Beach Music or Rules; Rules has a similar feel to TRICK, whereas Beach Music has a heavier *chiaroscuro* with more experimental details. *Fighting, Mis* (this is supremely good, with a moody piano intro), *Rules,* and *Message* are my favourites on RULES. For *Beach Music,* I like all the tracks, though *Salt, Brite Boy, In Love,* and *Ready* can fight for the throne of "favourite song".

I think from there, you have a solid grip on (Sandy) Alex G, and you should definitely listen to DSU (stands for Dream State University, not Dick Suck University, sorry), Rocket (I want to listen to this more), and his older albums too! They all have nuggets of musical gold and are all worth hearing. His new album, which is releasing on Sept 13 of this year, is House of Sugar and this is something you should anticipate as well, if you haven't already heard either *Gretel* or *Hope.* From a sample size of two songs, I predict that this album will contain traces of all his unique sounds from his albums, but with better production and even more imaginative lyrics. I'm SO EXCITED.

If you're already a fan, he's coming to Toronto on November 11 and 12th, both at The Opera House. If I'm still in Toronto, I'll see you on the 12th. If not, I'll be there in spirit.

P.S. Fund my mild (Sandy) Alex G obsession by buying me this: https://shop.thefader.com/collections/posters/products/sandy-alex-g-the-fader-issue-117-cover-20-x-30-poster

P.P.S. The poster can be shipped to:
mathNEWS
MC3030, University of Waterloo
200 University Ave. W.,
Waterloo, Ontario, Canada, N2L 3G1

P.P.P.S. Thanks in advance <3

staplED

1. https://sandy.bandcamp.com/
2. https://unreleasedalexg.github.io

LAST WEEK'S haltingSOLUTION

The king numbers each prisoner from 1 to 10 in decimal and each bottle of wine from 0 to 999 in binary. Then, he has only those prisoners from the set of 10 who correspond to a 1 in the binary number on the bottle drink from it. Each bottle then has a unique combination of prisoners who have sipped from it, and so each bottle can be uniquely identified based on who dies after drinking it. (For example, bottle #12 would only be drunk by prisoners 3 and 4, so if only those prisoners died, bottle #12 was the poisoned one.)

UW Puzzle Club

MCU SPIDER-MAN SEQUEL PLOT ADDENDUM

Two issues I ago, I believed that I had written a fairly exhaustive list of all the possible Spider-Men sequels, but after actually seeing Spider-Man Far From Home, I have realized what was the actual correct answer for the next Spider-Man movie.

SPIDER-MAN HOME GROWN MENACE

Peter Parker will have to face his most fearsome enemy yet: Fake News. He will have to prove his innocence the city he loves, but what can you do when people would rather listen to J. Jonah Jameson, proprietor of sensationalist lies, than find out the truth? To clear his name, he will have to team up with Matthew Murdock. While he is facing fire in the public eye, the city, while also facing fire from a different foe, will need Spider-Man and Daredevil to deal with it.

Beyond Meta

EXCERPT FROM THE RINGS OF SATURN, BY W. G. SEBALD, PAGE ONE-HUNDRED AND TWENTY-FOUR

Why I went to Waterloo I no longer know. But I do remember walking from the bus stop past a bleak field and a number of ramshackle buildings to a sort of village, which consisted solely of souvenir shops and cheap restaurants. There were no visitors about on that leaden-grey day shortly before Christmas, not even the obligatory group of schoolchildren one inevitably encounters in such a place. But as if they had come to people this deserted stage, a squad of characters in Napoleonic costume suddenly appeared tramping up and down the few streets, beating drums and blowing fifes; and bringing up the rear was a slatternly, garishly made-up sutler woman pulling a curious handcart with a goose shut in a cage. For a while I watched these mummers, who seemed to be in perpetual motion, as they disappeared amongst the buildings only to re-emerge elsewhere.

girafarig, with help from W. G. Sebald

gridCOMMENT CONCLUSION V140

gridCOMMENT *140.6*

And just like that, yet another volume of **mathNEWS** draws to a close and with it heralding the forthcoming of yet another exam season and crop of freshmen entering these esteemed halls. Maybe you'll be around next term, or perhaps will be whisked away to far-off locales like New York, San Francisco, or even Toronto to work for a number of months. Either way this section of this journey shall soon be coming to an end, and as usual for my custom, I would like to delve into the archives of **mathNEWS** and see how **gridMASTERS** of the past have made their grid.

But first, I would like to congratulate Ian Fox, the only person who submitted a grid on time for last issue, and thus is the winner of this issue's prize. Their answer to last issue's **gridQUESTION**, "What is your foolproof plan to ace every final exam?" was "Plan: Copy every exam onto a tennis ball, and then find somebody worse at tennis than me." Please come by the **mathNEWS** office at MC 3030 and badger the Editors for your prize.

This issue's grid originally appeared in volume 65, issue 4 (originally printed on June 24th, 1994) and was created by Jillian "GridFlakie" Arnott. Several of the clues were missing from the original grid so I had to do some interpolation to have this solvable. Your prize for successfully solving this grid is the satisfaction of doing so. Maybe one term I'll get around to actually reprinting a cryptic; goodness knows most people don't know how to solve those these days.
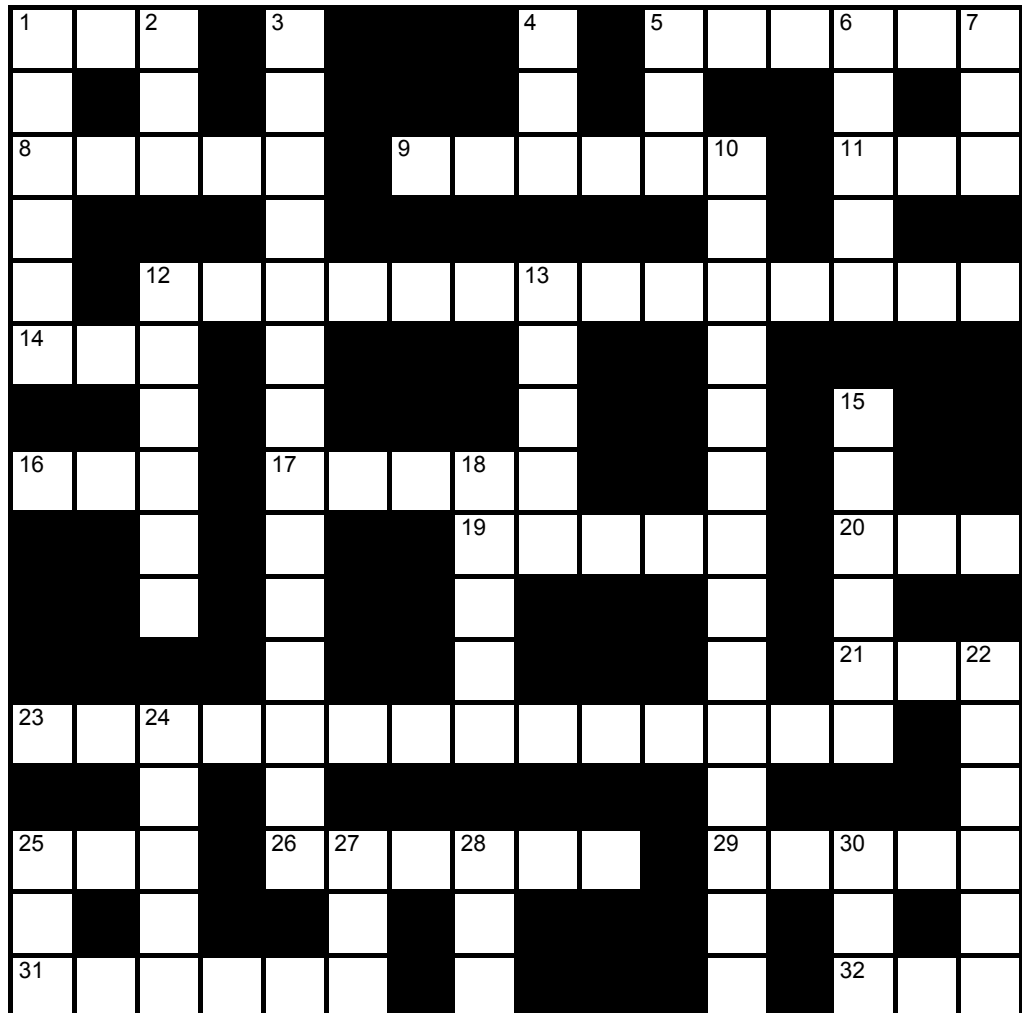
Signing off for another term,

Zethar
gridMASTER *Eternal*

ACROSS

1. Charged atom
5. Punctuation
8. First among the Greeks
9. Puts up with
11. This and death are unavoidable
12. Ditsy
14. Unisex pronoun
16. Adversary
17. Proclamation
19. Smallest
20. Brand ___
21. Unit of electrical current (abbr.)
23. An instrument for dispersing radiation into a spectrum and mapping the spectrum
25. Place which sells BEvERages
26. Blesses
29. Joining
31. ... Our home and Native land ...
32. Caribou cousin

DOWN

1. Graft by connecting a growing branch without seperation from parent stock
2. A short sleep
3. The integral part of a common logarithm
4. Supposed parapsychological faculties
5. Consume
6. It's worth the drive to _____
7. Wedding suit
10. Abattoir
12. Companion
13. Path
15. Extremely happy person
18. Hold on tenaciously
22. He found 6.626 * 10-34 J s
24. A heron that has long feathers in breeding season
25. Constrictor
27. ___ and cheese
28. Poke fun at
30. Frost

THE DAUGHTER WHO LIKES CHOCOLATE

haltingCOMMENT *140.6*

Two mathematicians are talking on a park bench when one turns to the other and challenges her to guess the ages of his three daughters. He gives her the following clues:

1. The product of their ages is 72.

2. The sum of their ages is that house number across the street.

The second mathematician replies that it's impossible to figure out with the current information, to which the first replies "Of course! I forgot to mention that the eldest loves chocolate."

After hearing this, the second mathematician immediately responds with the daughter's ages. How old are the three daughters?

This puzzle is brought to you by the UW Puzzles & Brainteasers Club, who meet every Friday at 6 p.m. in QNC 1507.

UW Puzzle Club

haltingHINT: Consider the implications of the information given. For example, in order for the eldest daughter to love chocolate, there has to be an eldest daughter.

LAST WEEK'S gridSOLUTION

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

THIS WEEK'S gridSOLUTION

Drop your grid**WORD** solutions off at MC 3030.

A PERPETUALLY BORED math**NEWS** EDITOR

lookAHEAD

SUN JULY 28	MON JULY 29	TUE JULY 30	WED JULY 28	THU AUG 1	FRI AUG 2	SAT AUG 3
Friendship Day. Ancient Egyptian Festival of the Dead. International Forgiveness Day.		Last day of classes! 🎊 National Cheesecake Day.	Pre-exam study day.	Pre-exam study day.	Final examinations begin. 😨 International Beer Day. 🍺	International Hangover Day. Grab Some Nuts Day. National Clown Day.

SUN AUG 4	MON AUG 5	TUE AUG 6	WED AUG 7	THU AUG 8	FRI AUG 9	SAT AUG 10
	Civic Holiday.					National S'mores Day.

IMPORTANT ANNOUNCEMENT

iron warrior > **mathNEWS**

don't @ me editors

[Editor's note: >:(]

the tool

NEW UNDERGRAD LINUX SERVERS

MFCF has deployed two new Linux servers in the undergraduate environment. The set-up is completely different from our traditional way. The older servers will remain available this year so you can get accustomed to the new ones while still having the familiar old ones to fall back on. We intend to retire the old ones at the end of 2019. Thin client terminals in the labs offer the choice of both (along with Windows). Details are on the MFCF web site at https://uwaterloo. ca/math-faculty-computing-facility/ student-linux-server-specifications

If you run into any problems with these machines please let us know at the Help Centre in MC 3017 or by opening a ticket at https://rt.uwaterloo.ca/ SelfService/Forms/MFCF/

MFCF

haltingSOLUTION

The solution is 3, 3, and 8. The "house across the street" means nothing to you, but the mathematicians know what the number is. Of all the sets of 3 that have a product of 72, only two share a sum: 3, 3, 8 and 2, 6, 6. As such, the puzzle is impossible to answer, until it is revealed that there is an eldest daughter.

UW Puzzle Club