



LC

## “WHAT’S mathNEWS’ NEXT BIG THING?”

Three distinct answers to this question were “mathNEWS 2.” There was almost a fourth (and almost a fifth, depending how you count), but they ended up getting changed. The writer’s room is in shambles this week.

mastHEAD answers aside, I’m a big fan of this issue. Seriously. I think “classical” mathNEWS has usually leaned lighter and funnier with the occasional think piece here and there, and this issue really got the proportions right. “N things” articles, “what your favorite \_\_\_ says about you” articles, parodies, deranged prof-centered fiction pieces, lots of profQUOTES, and a few thinkers sprinkled throughout. Really appeals to my first-year model of mathNEWS.

Well, I have a bit of space left to fill, and I’m in the mathNEWS office right now, so I guess I’ll ramble about that for a while. Have you ever been in here? Well, statistically speaking, probably not, so you’ll have to trust me on this. So, all the walls are completely *papered* with old issues of mathNEWS, newspaper parodies, photos, drawings, postcards, legal threats, and FOIA requests. All tacked and taped up on the walls like you’d see in some crazy conspiracy theorist’s bedroom. That brings me to what’s *mounted* on the walls: a bunch of shelves. These shelves are home to many things; here are some.

- The Red Books: a collection of 18 bound red books containing every issue of mathNEWS since 1973.
- A piece of wood from the Red Room: a large, multi-floor room in MC—demolished in ‘99—that used to house Waterloo’s supercomputers.
- A rectangular piece of door from the MC stairwells, cut out in the ‘80s for windows to be installed.

Of course, we also have a set of four filing cabinets, each full of our secondary archives: original flats from the analog days, second mint sets, floppy disks, and a bunch of old photos. With all that said, last week, a disturbing thought came over me: *the mathNEWS office is probably the most flammable room on campus*. Just food for thought, I guess. Maybe we should get a move on with digitizing our archives.

Well, our last production night of the term will be held on Monday, July 31<sup>st</sup> at 6:30 PM in M3 1006. Won’t you come join us? Maybe you could even write your own N things article!

evaluatED  
Editor, mathNEWS

evaluatED  
Editor, mathNEWS

|                     |  |  |
|---------------------|--|--|
| BOLDBLAZER          |  | mathNEWS 2   |
| __INIT__            |  | mathNEWS 2   |
| SKIT                |  | mathNEWS 2—environmentNEWS   |
| DICK SMITHERS       |  | Communist Prod Nights  |
| LABYRINTH           |  | a democratic editorship  |
| WINK WONK           |  | an issue with only gridWORDS   |
| BEYOND META         |  | Shirts featuring some of mathNEWS best covers. I just really want some cool mN merch               |
| LWO                 |  | mathNEWS’s next big thing issue  |
| Xx_420SONICFAN69_XX |  | MathSoc celebrity tabloids   |
| TENDSTOFORTYTWO     |  | the forced exile of every writer, editor, and reader who graduates before April 2025               |
| UW UNPRINT          |  | I’ve been telling the editors to start an investment firm for ages.                                |
| ROBBOTC             |  | mathNEWS War Crimes Division   |
| YALEVOYLIAN         |  | The programming language that I’m creating to facilitate pizza voting                              |
| PREDAP              |  | Claiming ownership of M3 and operating it as a rogue institution independently from the university |
| CUTLET              |  | not-fraudulent-whatsoever pizza voting machines  |
| FIRSTIE             |  | Incoming Students as a Service (ISaaS)   |
| BE’F UN-WELLINGTON  |  | mathNEWS 152.6   |
| TRIE                |  | Panzerottis instead of pizzas for prod night   |
| LARS NOOTBAAR       |  | A large shipment of Herbalife supplements that mathNEWS had to take out a significant loan for.    |
| WATER               |  | Journalism.  |
| Xx_420SONICFAN69_XX |  | Adult Content  |
| APHF                |  | Printing on legal paper  |
| EVALUATED           |  | An uncontrolled electrical fire in the office  |
| DISTRACTED          |  | a nice, thick, brand-new red book ^-^  |
| AWED                |  | Paying the editors a nice six-figure salary  |

## ARTICLE OF THE ISSUE

Wow. Such a good issue. So many good articles. Alas, only one of them can be Of The Issue: Rizz Club, and Hard Lessons You’ve Been Avoiding, by no pun indented. Visit MC 3030 for a prize!

## How much do fire-proof filing cabinets cost??? 😞

EVAN GIRARDIN, mathNEWS EDITOR FOR SPRING 2023  
ALONG WITH DANIEL MATLIN AND AWAB QURESHI

# mathASKS 152.5

## FEATURING PROFESSOR COLLIN ROBERTS

**LABYRINTH: WHAT GOT YOU INTO MUSIC, AND WHAT ARE SOME OF YOUR FAVOURITE SONGS TO PLAY? WHAT INSPIRES YOU?**

My mom plays the piano. When I was a kid, she played at home often enough that she tricked me into asking for lessons for myself, at the age of 7. I kept up with piano until I finished my Conservatory Grade 8 at age 18. In the meantime I had discovered rock music and had started playing guitar at age 16. I had some lessons on classical guitar to start, then taught myself the rest from imitating my guitar heroes (primarily Alex Lifeson of Rush, Rik Emmett of Triumph and Steve Howe of Yes). I played in a Rush tribute band called YYZ from 1996 until 2007. Although we don't play gigs any more, we still jam on Rush music as often as possible. My favourite musical genre is progressive rock. I'm inspired by anything that appeals to both my head and my heart, and I get that most often from progressive bands.

**PMATH ENJOYER: WHAT MADE YOU PIVOT FROM ALGEBRA TO YOUR CURRENT INTERESTS?**

Algebra will always be my first love. When I finished my PhD and started looking for a lecturer position, it quickly became obvious that there were more opportunities for me in CS than in pure math. I'm grateful that the School of CS was willing to hire a mathematician like me, and has continued to give me mathematically-oriented courses to teach, when possible.

**TENDSTOFORTYTWO: HOW DO YOU FEEL KNOWING MOST OF THE SOFTWARE WE USE EVERY DAY ISN'T FORMALLY VERIFIED?**

Deeply fearful. I hope that the software has been tested!

**FAILING: WHAT'S THE WORST COURSE YOU PERFORMED IN AS AN UNDERGRAD?**

STAT 332. How ironic that I taught it twice after I finished my PhD!

**JEFF: WHAT'S YOUR FAVORITE BATHROOM ON CAMPUS?**

There are many good choices. I'll have to go with the one on floor 3 of M3—so pristine; so peaceful.

**BOLDBLAZER: IF YOU WERE TO TEACH ME CS 245 AGAIN, WHAT WOULD BE SOME TOPICS THAT YOU HOPE I WOULD GET TO UNDERSTAND THE BEST?**

I think that the semantics of first-order logic are the most transferable to other subjects in math and CS.

**PREDAP: HOW DOES WORKING WITH STUDENTS IN THE ENVIRONMENT OF AN ADVISOR COMPARE TO WORKING WITH THEM AS A PROF?**

Advising is completely different from lecturing. Advising is more “big-picture,” whereas lecturing requires one to get down into the weeds. After a good day of advising, I will feel that I have helped some students towards successfully completing their degrees. When I finish teaching a course, I feel that I have helped the students make progress, but only in that one moment—it's more fleeting.

**YALEVOYLIAN: ARE THERE ANY PARTICULAR CAREER PATHS THAT YOU WOULD RECOMMEND TO SOMEONE ALSO INTERESTED IN FORMAL VERIFICATION AND/OR ABSTRACT ALGEBRA?**

Both of those disciplines would naturally lead one to academia. My own path back to academia after finishing my BMath was far from a straight line. I worked in IT for more than a decade before starting on my MMath. The first year of it was rough (I had forgotten nearly everything from my BMath), but somehow I survived. Now I have a position that aligns with my values much more closely than my industry jobs did. To sum up, always make the best decision for yourself that you can given what you know so far, and never be afraid to course correct later on as you learn more. Prepare to be amazed by what happens when preparation meets opportunity!

**ROBBOTC: JUST WANT TO SAY A VERY BIG THANK YOU FOR BEING WITH ANIMUSIC AT EVERY REHEARSAL (♥). WHAT IS YOUR REASON FOR HELPING US SO MUCH?**

You are welcome! Your club is full of talented musicians who also happen to be pleasant to work with. Who wouldn't want to work with a club like that?

**EVALUATED: WERE YOU PART OF ANY CLUBS IN YOUR UNDERGRAD AT WATERLOO? ANY INTERESTING STORIES?**

Sorry, I regret that I wasn't in any clubs during my undergraduate career. I'm afraid that I devoted all my spare time then to making music. A few interesting stories did come from my music-making, but those stories mostly took place after my BMath was finished, when my Rush tribute band started gigging regularly. It is worth pointing out that this band was made up of musicians I met during my BMath, and with whom I am still friends to this day.

**JEFF: WHAT'S KEPT PULLING YOU BACK TO WATERLOO?**

I love mathematics. I was fortunate to grow up in the same city as (in my humble opinion) the best university for mathematics in the country. I wouldn't want to be anywhere else.

# MATHSOC SEZ

## SPRING 2023 GENERAL MEETING HIGHLIGHT REEL EDITION

This week was the MathSoc S23 General Meeting, where all Math students were eligible to vote on issues affecting the Society as a whole and hear updates from the MathSoc Executives about what they've been doing all term.

I am writing this before GM because of the nature of prod nights. Did GM actually turn out as described? Only those that came to GM will know! (Or you can read the meeting minutes.)

### AGENDA ITEMS

These were the motions on the agenda at the time of writing.

- The assembly voted on and appointed two Math students to sit on our Board of Directors for a year. Board oversees the operational and long-term aspects of the Society. It is made up of Math student volunteers.
- Minor bylaw change to make the description of executive duties line up between bylaws and policy. It's very minor but all bylaw changes have to go through GM, which is why this is here.
  - Bylaws are like our constitution. They're how things must be done.
  - Policy is like a list of recommendations of how things should be done.
- We had a discussion about how MathSoc can better support the Math community and create safe spaces.
  - There are a lot of resources out there—what's the best way we can use those resources to help, and are there ways we can make them more effectively help Math students?
  - MathSoc wants to cultivate a safe environment for all.
- Five minutes of form-filling happened.
  - MathSoc's VP Academic and the Dean's Office (ADUG) are working on a "triage system." Students face concerns in their academic journey but may not know who to contact or where to go. This project will direct Math students to the right resources, and we need to collect possible concerns from the student body first.

The six MathSoc Executives and the Chair of MathSoc also presented reports on what they were doing for the term. **mathNEWS** (hi editors!!) presented their budget.

### SECRET AGENDA

A very special motion was brought to GM as a surprise.

Every Math student knows and loves the Math CnD. What you might not know is that it's run by Rose Penner, MathSoc's Business Manager, and that she's run it for the past ten years.

The least the volunteers of MathSoc could do was to sign a card thanking her for everything that she does, and then present the card at GM. At the time of writing this article, we are at 95 signatures, featuring past and present MathSoc volunteers, CnD staff, and a few others. My hope is that by the time GM hits, we will be at 100.

If you visit the CnD, tell Rose how much you appreciate her!

### IS THE CND RUNNING? YOU BETTER GO CATCH IT!

Speaking of the Math CnD, how is it doing?

One of the biggest things the CnD is doing is making improvements to the space. Budget has been approved for a complete upgrade to the point-of-sale system to keep our technology up to date. There are other planned improvements like adding new food warmers, cooler display units, freezers and fridges, and racks—we're in the process of planning those upgrades right now.

New food offerings have been brought to the CnD, like a wide selection of bagels, Singaporean food, and various snacks! And for all the incoming first years reading this, some tried-and-true CnD classics include the Jamaican patties, chili and breadsticks, mac n' cheese, and of course, the coffee and donut selection.

### EXECUTIVE FUNCTIONING? WE SURE ARE!

This is now the third time I've used this joke in MathSoc materials. I don't have an infinite pun repertoire! Anyways, this section covers some updates from the MathSoc Execs.

The VP Finance doesn't get enough appreciation for their behind-the-scenes contributions to MathSoc, and I'd like to take a moment to highlight the contributions of the role. This is the person that makes sure people are getting their money back when they purchase things for their clubs and MathSoc.

They deal with budget so that the operations of MathSoc and the clubs can continue chugging along—whether it's budget for events or for office supplies. This is integral to the Society. Without budget and the VPF's contributions, we couldn't budge it (the Society's operations).

Also, shout-out to the VP Communications and all the hard work that goes on with our marketing! Without them we wouldn't have photography of our events, cohesive and widespread marketing of our events, or entertaining content to entice folks to participate in the Math community.

### INSERT A RELEVANT PUN HERE (EVENTS)

July has been a packed month for events, and we're pleased to announce that our events have been going really well! Thanks to all of our attendees—we hope you had a great time!

Party with Profs was incredibly well-attended. The semi-formal was a blast, and there's some pretty great photos from the event. Pi Approximation Day is happening the day this article is being published, and I think we'll really dish out pieces of cake in the spirit of Math! Never mind that  $\pi \approx 22/7 \approx 21/7 \approx 3$ . (July 22 is a Saturday, so we're really approximating pi.)

#### UPCOMING EVENTS

#### Games Night with Profs—July 25 | 6–8 pm | Math CnD

We'll be playing board games with some wonderful profs! MathSoc will provide the games and dinner. Just bring yourself!

#### End of Term Yoga Destress—July 26 | 6:30 pm | PAC

We're hosting a destress session before finals season! It's no stretch of the imagination that taking a break from finals studying is beneficial in the long run.

#### F\*\*\* Up Talks—July 24 | 4–6 pm | MC Comfy

It's okay to mess up. A panel of upper years shares their experiences to help attendees know they're not alone.

#### MathSoc EOT Ice Cream Social—TBD

We kicked off the term with an Ice Cream BOT, and now we're ending the term with one. It all comes full circle—we've come a long way.

#### MATHSOC(IAL)

**In person:** MC 3035 and MC 3038

**Our website:** <https://mathsoc.uwaterloo.ca/>

**Email us:** [info@mathsoc.uwaterloo.ca](mailto:info@mathsoc.uwaterloo.ca)

**Instagram:** @uwmathsoc

Unfortunately (or fortunately), fewer puns this time.

Grace Feng (MathSoc President, S23), on behalf of the S23 MathSoc Executive Team

## LOOKING FOR A SONG

Do re mi fa mi re do re do so2 do fa2 do fa2 mi2 re2 do2 fa2 fa2 mi2 fa2

The 2 specifies an octave lower (idk how you're supposed to do that). Unfortunately the person who is trying to find this song doesn't remember anything else, so solfège is all the info you will get. Please contact PMC if you have any leads.

Zbajffjsakd

# A STATISTICAL ANALYSIS ON THE BOSTON CREAM DONUT FILLINGS

## PART 1 OF N: MOTIVATION

If you have been consuming Boston cream donuts in the vicinity of University of Waterloo, chances are you've come across the Mathematics Society's Coffee and Donut shop and their \$2 donuts. While it may not sound like much, \$2 for a mere donut is a rather steep price tag (in this economy?). It's unfortunate that I was not there to bear witness to the C&D pre-renovation; however, it was not too long ago that one donut cost only \$1 at any Tim Horton's location in Ontario.

It remains to be seen, however, whether you should frequent Math C&D for their donuts. After all, it is quite a commitment for one to exchange the equivalent of  $\frac{1}{15}$  of an ION ride for a moment of fleeting joy on the tongue.

Yet, increasingly, have I found myself in a mix of disappointment and emptiness on each commitment. Perhaps it is the diminishing of returns on each donut that desensitized my tongue? Perhaps it is the mundaneness of the routine wearing away the stimulation of the grand reopening? (It's already been almost a year now, wow...) Perhaps it is the economy? I know not.

What I do know, however, is that I still long for this flash of delicacy. My tongue salivates at the thought of another bite into the rich interior of the Boston cream donut. The mixture of sweet chocolate icing balanced with the richness of the (custard?) filling makes every piece a savory gourmet.

But it seems to be ever more fleeting day by day. It seems that what used to be an immediate sensation of bliss at every bite of the donut has now degraded to two chunks of dry dough for each portion of cream filling. Why order a Boston cream, if not for the cream?

Thus, I pose the question: "how much cream filling is there, really?" And, perhaps, more importantly, "how does the proportion of cream filling compare to other donut shops?"

To be continued in Part 2 of N.

P.S: I did not upload a picture of Math C&D Boston cream donut because I did not want to trap people into donut thirst. It is totally not because I forgot to take a picture today.

P.P.S: This statistical study is looking for research funding! If you want to fund more samples for me to tally, please consider reaching out to my Patreon at <404 ERROR>. You can buy me a coffee! (Or a donut is fine too, I guess.)

RobbotDonut

# WHAT THE HELL IS mathNEWS?

**TL;DR: WE GIVE YOU PIZZA AND PUBLISH WHATEVER THE HELL YOU WANT**

Perhaps you're on a campus/faculty tour at this brilliant academic institution. Or perhaps you're attending an event like **EMACS (yes, we know you're here)** and have been taken on a walk through the math buildings by your lovely hosts. Or perhaps you're a curious student from another faculty, and you made a wrong turn on your way to SLC. Either way, you've stumbled upon this issue of **mathNEWS**.

## WHAT THE HELL IS mathNEWS?

We are a student publication for the students and staff of the Faculty of Mathematics—6 issues a term, 3 terms a year, 50 years and counting. We're nearly as old as the University itself, but we don't take ourselves very seriously except when we choose to. In the past, we have even been ridiculed for some of our more outlandish or subversive content. And despite that (or perhaps *because of that*), **mathNEWS** is booming. Our issues are longer than they've ever been. **Don't feel like you need to read cover to cover**; almost nobody does.

We are editorially independent from the university, math faculty, WUSA (our student union), MathSoc (our student society), and everyone else who allow us to exist with their gracious funding and support. That means (within reason) **we can publish whatever the fuck we want!**

- curse words!
- fake news!
- dank memes!
- Among Us memes?
- art! (featuring lots of geese)
- rants meant for our therapists! (how did they end up here?)
- bullet-point lists of N things that nobody asked for!
- slander about people we have beef with! (like Imprint and engineers)
- back and forth letters between writers who should really take it offline!
- silly **profQUOTES** and Q&As (**mathASKS**) from our favourite professors! (some profs also contribute a **profTHOUGHTS** article about whatever they want)
- poetry!
- self-referential commentary about **mathNEWS** itself!
- advice!
- love letters to our niche interests!
- crossword puzzles! (we call them gridWORDS, and you can get **prizes and eternal glory** for solving them)
- educational cartoons about abstract concepts in mathematics and computer science that usually end up being equations and definitions in speech bubbles with beautiful art to distract you!
- creative fiction!
- recipes!
- and as our name suggests, we (rarely) have actual math and news too.

Sometimes we lean too heavily into it and lose sight of our audience, which is partly why I'm writing this article for the uninitiated.

## WHO THE HELL IS mathNEWS?

Most of us are undergrad students in the math faculty, but **anyone anywhere can submit articles and art** to be published in an upcoming issue of **mathNEWS, including you**. There are no assignments, we each just choose what to write. Your work doesn't need to be professional—after all, it is unpaid. But, if you're on campus, we have **free pizza, snacks, and drinks** (non-alcoholic) for contributors at our production nights every other week! Each issue, the editors also choose an Article of the Issue. The writer of that article gets a **\$25 gift card** to spend at Conestoga Mall!

**Production night is a lot of fun** (can confirm, I was the pizza). We hang out for a few hours and barely any writing gets done while we banter about nerdy topics, our personal interests, and the outrageous news of the week. At some point the food comes out and we move to the tables of the Math Coffee and Donut (CnD) shop to eat, while jealous passers-by ask if they can have a slice.

The result of all this is that we're a self-selecting group of people who like writing, like pizza more than they hate writing, or are friends of the former. We're not a representative sample of the faculty—no club is. However, we're also not as homogenous as you might think. It's easy to sit on the edge of a group, look in, and see a prickly circlejerk of in-jokes and shared opinions. We're not all friends; I've been here for 4 years and I've never known everyone.

In fact, **you can be completely anonymous** in **mathNEWS**. Most of us submit under pen names that we keep with various degrees of secrecy. Some of us become editors. You can tell who the editors are because they have **ED** at the end of their names, like **evaluatED** or **god ⚡ peED**. The editors handle the finances, manage our meetings, moderate our Discord server, fix our spelling mistakes, approve our articles, and painstakingly arrange them into coherent pages. In return for their labour of love, they're banned from winning Article of the Issue, because it would be a conflict of interest if they did.

## WHERE THE HELL IS mathNEWS?

Our office is located in the gleaming capital of our faculty: the **third floor of the Mathematics and Computer Science building (MC)**. You can't miss it—there are a hundred copies of **mathNEWS** on display in front of our door. Feel free to say hi if there are people (usually editors) in the office! We're not allowed to bite. We can hear you anyway, so don't pretend you're not there.

But **mathNEWS** is not a place, it's a people. During the exile of COVID we formed a strong online presence in our Discord

server. Our website [mathnews.uwaterloo.ca](http://mathnews.uwaterloo.ca) lets people write articles from anywhere. You can also **sign up for our mailing list** on there to find out about meetings and such.

**WHY THE HELL IS mathNEWS?**

It's because math is *special*. But really, it's because we had the power of sheer numbers and student interest to make something like **mathNEWS** feasible. That's pretty much how all university student clubs start. The engineering faculty, even larger than math, has a newspaper too, called the Iron Warrior. I'd like to contend that **mathNEWS** is better—there is a stronger culture of reading and writing **mathNEWS** that makes us self-sustaining even as editors and writers come and go.

**HOW THE HELL IS mathNEWS?**

Doing great! Thanks for asking.

water

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## SPIN THE LAZY SUSAN

I think that every person who has seen a Lazy Susan has wanted to spin it for the sake of spinning it. For those that don't know, a Lazy Susan is a giant circular rotating platter in the middle of large tables at Chinese restaurants. Waiters put food on it so that when you want to grab some dumplings but they're on the opposite side of the table, you can spin it around to bring it closer to you so you can actually access them.

Unfortunately, we live in what scientists these days call a "society." You might have heard of it before. The implication, of course, is that mindlessly spinning the Lazy Susan at your grandmother's birthday dinner is generally regarded as impolite by Big Parent.

There are a lot of things that look fun but you're not "supposed" to do. Like running up the down escalator.

These are pretty reasonable societal guidelines, I think you'll agree. But say you're out and no one is gonna be hurt by doing something that deep inside, you really want to do. Then go do it! Run up the escalator when there's no one around. Spin the Lazy Susan when you're at a table with friends. Life is short. Go do the thing.

And for what it's worth, I recently was at dim sum with some friends, and there was a Lazy Susan on the table. And you can bet your ass that before the food came, I spun that fucker to my heart's content and it was *exactly* as good as you think it is.

hyperlynx

## N THINGS TO SAY INSTEAD OF "YOU SUCK"

- AND THE CROWD AINT HERE 🙄🙄🙄 🔥 🔥 🔥 !!! !?
- Bro is cooking but the oven isn't even preheated!?! 🙄🙄 🔥 🔥 🔥
- I think it's wonderful that there are so many languages in the world 🌐 and you still choose to speak nonsense 🙄 !?
- AND THE CROWD CHEERS FOR A REFUND 🔥 🔥 🔥
- Bro is cooking but Gordon Ramsay is lacking the lamb sauce
- You dropped this 👑 please never pick it up again 😊😊😊
- AND THE CROWD GOES MILD!!!!!!!
- Bro is cooking but no one is eating 🙄 !? !!
- Did not serve 🍴 and you did not even eat !? !!!!
- AND THE CROWD NEEDS A MOMENT TO DELIBERATE !!!! 🔥 🔥 🔥
- Bro is cooking but we allergic !? 🙄🙄 🔥 🔥 🔥
- Everybody has a creative outlet 🎨 and yours is not even connected!?! !?
- AND THE CROWD EXCHANGES CONFUSED GLANCES !! 🔥 🔥 !!
- Bro is cooking but everybody so creative 🤖 🔥 🔥 🔥
- Thumbs down emoji [sic. like literally say the words "thumbs down emoji"]
- AND THE CROWD WANTS TO GO HOME 🔥 🔥 🙄🙄 🔥 🔥
- Bro is cooking but is spitting cold air!?! !? !? 🤖 🔥 🔥
- The assignment 📖 was incomprehensible to you 🤖 !?
- AND THE CROWD IS GOING TO BREAK OUT INTO DISCUSSION GROUPS!!!!!! 🙄 🔥 🔥 🔥 🔥

Skit

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## A WILD WEEK FOR SPEEDRUNS

July 15—31:24 Hollow Knight (Any% NMG) by SkateKing

- Absolutely cracked, category is dead

July 16—25:24 Celeste (Any%) by secureaccount

- Absolutely cracked, category is dead

July 16—14:48 Mike Tyson's Punch-Out!! (Fullgame, Single Segment) by SummoningSalt

- Absolutely cracked, he'll probably still run it though

ptkyr

# RIZZ CLUB, AND HARD LESSONS YOU'VE BEEN AVOIDING

I (20m) went to Rizz Club. Here's the story.

I figured it might be fun to make a visit to our campus' Rizz club, which professes to teach relationship skills. But not just any visit; I needed to commit to the bit as hard as I could. So I made a three-part plan.

1. **Costume:** Wear shades.
2. **Practice:** I sat down for a minute with a group of students from another club at a restaurant. They didn't know how I knew they were there. I said nothing.
3. **Personality:** I needed to feel as full of myself as possible, so I got myself a personally cooked meal from the head of the UWaterloo Cooking Club (actual best meal of my life, btw).

After putting all this in place, I was ready. I arrived outside E5 6006 at 8:16pm... Too early. As I waited, I contemplated whether the attendees would be there ironically. I thought: pretty darn ironic. Eventually the clock hit 8:20, and I walked into the room 20 minutes late.

I sat down in the middle of the class. A few heads turned, but most were watching Michael, the Chief Rizzler, present about healthy communication. Suffice to say, they were there very unironically. Soon there was a break, and immediately 3 guys looked at me from different parts of the room; like heat seeking missiles, they beelined over to me to start a conversation.

## Hard Lesson You've Been Avoiding #1:

Girls don't just walk up to you if you try really hard to be cool.  
Just guys, I guess.

In case you were wondering, the class was almost half full of girls. Anyway, having prepared myself to be mysterious and self-centered, it wasn't hard to project confidence in the conversation: I gauged what I needed to say to impress them, said that, and as soon as the conversation died I left the club (an hour early).

So that was fun. But dangerous.

## Hard Lesson You've Been Avoiding #2:

Putting on a show for other people is addictive.

Soon I was planning a full-on show at a future Rizz Club. I was going to make a momentary appearance at the next meeting and leave my phone number on the chalkboard—this was part 1—to set up part 2 of the plan; the idea was that if I had left my phone number, then the people at Rizz Club might expect people to be interested in me at the next meeting. Basically this was the show: four friends in maid costumes were going to come by the next week and, uh, throw themselves at me during the presentation.

I executed the first part of the plan, left my number and all. But I noticed something off: there were way less people at the club, and the few people there were clowning as hard as I was. And despite this, Michael was still giving a genuine and actually informative presentation on ways of working through trauma.

I started reconsidering my plan. Sure, the club was inaccurately named, and most of the people there were there as a joke, but Michael and a few loyal attendees were actually trying to learn, being honest and thoughtful about how to sort out some of the problems in their life. It'd be pretty darn mean to clown on them for that.

So I called the plans off. Being serious for a moment, I realized there's people at all different stages of life at this university, and just because I've sorted out a few of my personal problems *does not* give me the right to make fun of—or a fool of—other people who are working through problems of their own.

I respect Michael for making a space for and sharing important knowledge with people who need it, and I think we should all have a little more empathy for the different types of people in our community, regardless of how easy they are to make fun of.

## Hard Lesson You've Been Avoiding #3:

Even if people are at a completely different stage of life than you, you should still meet them where they're at.

I learned a lot during this! Hope you learned a little too.

no pun indented

---

## LISTEN

She says "You're so lucky, I wish I could date women"

She assumes she knows me based on how I look and who I'm dating

He asks how to best refer to me and truly listens to my answer

He apologizes when he slips up and actually changes

We don't need you to be perfect

We need you to try

normalparameters



# A SIMPLE WEEKNIGHT MEAL

If you're anything like me, you know it's hard to make a quality, home-cooked meal on those busy weeknights, especially with kids to feed.

I don't have any kids and it's tough already, so it must be even tougher with them.

That's why, today, I wanted to share a quick and easy recipe that me and my girlfriend rely on for those hectic weeknights.

## GO TO THE RIBFEST

This might be tough to get depending on what grocery stores are near you, but I managed to find the KW Ribfest going on right next door to my apartment.

An quick, nutritious meal, containing essential nutrients, like protein, fat, and wood smoke. Perfect for—

What? Your friend's coming to visit this weekend? Yeah, I guess it makes sense to go tomorrow then. Hmm, so I guess we can make

## EASY FISH STEW

- 2 cloves of garlic, minced
- 1 small onion minced
- 2 cups chicken stoc—

Huh I thought I bought the bouillon paste. You said I did, right? Guess not. Well, we have some beef broth from a few months ago, that doesn't go bad right? Alright let's keep going with the ingredients.

- 3 potatoes, cub—

Oh, we don't have any potatoes either, huh. We really need to hit the grocery store. Maybe let's have

## RANDOM SHIT FROM YOUR FREEZER

- Some freezies
- Green onion pancakes
- Three half-empty cartons of ice cream
- 2 ancient frozen beef bones

Hey wait a minute, beef bones and beef broth, I bet we can do

## BEEF STEW OF SOME KIND

- 3 potato—

No, we still don't have those. Let's just skip them.

- 3 potatoes cubed
- The beef broth from earlier
- Two leftover beef ribs that were probably cut off a real piece of meat a year ago

- Carrots, chopped
- 1 small onion, diced
- 3 cloves of garlic minced (let's be real, no one counts the cloves of garlic, right)
- Butter (some)

I think we have all this? Let's get started.

1. Chop the onions and garlic.
2. Get a pot and saute the onions and garlic in butter
3. Pull carrots from fridge
4. Oh my god, I did not know carrots could get that rotten, it looks like the guy they melted in acid on *Breaking Bad*
5. Get another (better) carrot, peel and chop
6. Add beef broth to pan, along with carrots and beef bones

At this point, your girlfriend should start cleaning out your kitchen cabinets and find a bag of black rice. Hey, that might replace the potatoes?

7. Check the ratio of liquid to rice
8. Ignore that and toss the whole bag in because it's taking up too much space in the cabinet
9. Pre-emptively add balsamic vinegar because you think it'll need some extra flavour
10. Stir and watch as the stew turns an increasingly unpleasant shade of purple
11. Taste and realize you put in too much balsamic vinegar

And dinner is served! It is now 10 PM. Don't forget to take a glamour shot for the 'gram!



# THE LONG AND SHORT OF IT

## ANSWERING ALL OF YOUR BURNING QUESTIONS

Welcome to “the long and the short of it,” the advice column where I give both a short, instinctive piece of advice alongside a much longer (potentially too long) piece of advice.

**Question:** How do I know if I’ve fallen out of love with someone I should be in love with?

**Short answer:** Listen to “The Mess Inside” by The Mountain Goats (WARNING: SUPER EFFECTIVE).

**Long answer:**

That question assumes you can rationally figure out desire (I don’t think you can) and that there is a way you “should” feel about somebody (I don’t think there is).

I was in a similar situation when I came to university. I had been in a relationship for most of my adolescence but had fallen out of love for what seemed like no reason. I felt selfish and wrong. Of course, after breaking up, it quickly became apparent that it wasn’t for no reason. There were lots of things that were wrong that I wasn’t noticing until I had room to re-evaluate the relationship.

That being said, I don’t think that feeling temporarily unsure of your love means that the relationship must end. If it is your goal to find someone to spend your whole life with, you must come to terms with the fact you are unlikely to feel totally in love with someone for decades. How long you’re willing to wait for that love to come back (knowing that it might not) depends on who you are.

Here are some questions that might be helpful:

- What would you want to do this relationship if you knew this feeling would last for only a week? What if it lasted a year?
- Can you be honest with your partner about how you are feeling?
- What does it mean for your relationship if you can’t?
- How important is commitment to you? Would you want a partner who “held out” if they were unsure of their feelings?
- Do your friends like your partner? Do you and your partner bring out the best in each other?

And a note on feeling like you “should” love this person: if love were that easy, it wouldn’t really be worth it. You should be honest to your partner (and to yourself) to the best of your ability.



**Question:** How should I go about reaching out to people I haven’t talked to in a long time? I want to maximize the chance we actually have a conversation.

**Short answer:** Ask if they’d like to get thin-crust pizzas sometime.

**Long answer:**

Keep the offer low-stakes but specific. You want to give them enough grace that they can put the time in their schedule, but not so much that you’re going to be worried for a prolonged amount of time. Saying “hey we should hang out sometime” is probably going to end up in nobody making plans. Saying “do you want to come over for a four-course home cooked meal” is too much. “Do you want to get ramen sometime next week?” is in the sweet spot.

Let’s assume you’re reaching out over text. To determine the tone of your message, you can ask yourself how you would act if you got stuck in an elevator with this person. Would you feel the need to apologize for something? What hangups might the other person have? You probably don’t need to acknowledge these outright, in fact, this might make the meet-up a lot less casual than it needs to be.

This brings us to the reason you’re looking to reach out. Is there something genuine that has prompted this? *Hey, I was just on the bus last week and I saw someone reading that book you always wanted me to read, and I started to wonder what you were up to. Want to get bubble tea? Or something that’s been on your mind lately? I was reading this advice column in mathNEWS about reaching out to old friends, and I realized I’ve been wanting to message you for a while now. It might just be enough to say hey, it’s been a while since we caught up and I’ve missed you. Are you free sometime next week?*

*\*Disclaimer: if this is someone who has asked you not to reach out, don’t do it!*



If you’re interested in submitting your own question, scan the QR code below.



# WHAT YOUR FAVOURITE PASTA SHAPE SAYS ABOUT YOUR MATH STUDYING HABITS

## SPAGHETTI

- You are best at doing math late at night
- You do not proofread your assignments
- You are a sparkling water drinker

## RIGATONI

- You care a lot about the aesthetics and flow of your proofs
- You study best by explaining things to other people
- You take feedback on your assignments very seriously and will ask for remarks for anything unfair, and tries to convince your friends to ask for remarks instead of just letting it slide

## GNOCCHI

- You drink tea while studying
- Either you handwrite your assignments and have a distinctive handwriting, or you have a custom QED symbol in LaTeX
- You dislike using tables

## BUCATINI

- You are a LaTeX user

- You figure out problems best when munching on snacks
- You review your notes after class regularly

## ROTINI

- You wear black and are constantly covered in chalk
- You listen to music while doing math
- You prefer using symbols to words

## RAVIOLI

- You actively go to office hours often and ask good questions
- You like collaborating on assignments but study for exams better alone and in complete silence
- You take a variety of courses from different areas of math and are probably doing multiple minors/a joint

## TAGLIATELLE

- You are Noah
- You are cool + awesome + attractive + we are beginning pizza voting period

*treee*

## PASSION VS MONEY: WHO WINS?

Throughout the past few terms, I have been faced with this particularly difficult question. Do I go for what I am truly passionate about? Do I go for research full-time and disregard all other options? Will it even be the career of my dreams as I hope it will? Will it suffice financially?

These are all questions that I have had to come to terms with in order to figure out possible future paths. This term, I have been fortunate enough to find a supervisor in my field of interest willing to give me a preview of what this career path looks like! Throughout this term, I found the research to be as exactly as I dreamed it would be. It is wonderful. It is a continuous learning opportunity that just keeps on giving. In the office I share with other researchers and we laugh and learn. We cultivate an environment that pushes all of us to do our very best. Whenever I am stuck on something I find someone who is more knowledgeable than me to guide me. Top this up with little to no pressures and you get my perfect work environment. It seems a little too good to be true. What is the catch here? What is the monster in the closet? What hidden cost am I paying?

As it turns out, research is not one of the most lucrative jobs on the market. The pay potential pales in comparison to other

software/related jobs. Now, this comparison may not be fair, but it is valid. It does have decent potential, but the road is long and hard. So now the question remains: what do we value most? Do we value the passion and the environment that we have come to love? Or do we value money and all the comforts that come with it? That includes financial stability and the ability to pursue hobbies, living comfortably with your partner, etc.

For some, this is a straightforward decision, for others not so. The way I realized research is 100% what I want to do full-time, is by looking at my life 30 years down the road. Would I be satisfied with it? Would I enjoy it? This made the decision trivial for me. This is the one consideration a person should make. Would you be happy with your life? Money is not everything. Yes, you need it to survive, but it is not everything, and realizing that made me pursue my passions even at the cost of earning potential. I value passion and contribution to human knowledge more than I do a nice fancy home, so research it is!

*Kermit*

# profQUOTES

## CS 349: JEFF AVERY

- “ If you see really really good diagrams in this course, they’re Dan Vogel’s, not mine.
- “ People expect fast apps... if your app takes a while to switch screens people will curse your name.
- “ I literally had it working, then I deleted a bunch of code for you to fill in.
- “ Some things you can’t undo. Try unprinting a file.

## CS 458: ADITYA VADAPALLI

- “ Imagine if you purchase an e-book on Kindle and give more money to Bezos.
- “ The easiest way to get private information retrieval is if Google sends you the whole internet every time you tell it “I’m searching for something.”
- “ A database is an  $r$ -by- $s$  matrix over a finite field.
- “ These are zeros, I dunno why I wrote  $\ddot{e}$ .

## MATH 225: PAUL BALDUF

- “ Any suggestions for Canada Day? [*Students give a plethora of viable suggestions*] Well, maybe I’ll just eat a bottle of maple syrup and call it a day.

## CO 250: KANSTANTIN PASHKOVICH

- “ Let us consider the special case. I once tried to prove this for the general case, and it felt very painful. It looked like pain but no gain.
- “ I am really sorry to those of you who are computer scientists.

## CO 342: PETER NELSON

- “ Hungarians like subgraphs more than they like minors.

## CS 230: MURRAY DUNNE

- “ We don’t live in America. We are reasonable people. We use reasonable units.
- “ The moon is way bigger than DC Library, I have it on good authority.
- “ This is out of the solar system slow. This is Alpha Centauri slow.

- “ Even if I can run to DC Library 5 million times a second, it still takes me a hilariously long time to run to Alpha Centauri.

## CS 234: CAMERON MORLAND

- “ Trees don’t just solve global warming, they solve computer science problems.

## CS 241: GREGOR RICHARDS

- “ The stack grows in defiance of logic and gravity.
- “ `*(a + solveWorldHunger()) = destroyEarthIfStrife()`
- “ I’m gonna solve world hunger first, then I’m gonna destroy the Earth if there’s any strife in it.
- “ What the hell is wrong? Every single line of this has an error...
- “ The  $g$  in `gcc` is not for me—Gregor—but GNU. The linker is called `ld` because we don’t know how to spell linker.
- “ Linux uses ELF. In fact, all modern operating systems use ELF—that is, not Windows or MacOS.

## CS 341: ARMIN JAMSHIDPEY

- “ There’s somebody in my head. You don’t hear them, but I do...

## CS 350: KEVIN LANCTOT

- “ [*Student: “What’s the median of the midterm?”*] It’s the middle number.

## ENGL 306A: RANDY HARRIS

- “ [*Teaching from a QNC classroom*] There’s something more ominous about MC.

## PMATH 347: DAVID MCKINNON

- “ Let’s talk about the Gaussian integers, which is named after the German math professor whose name is Integer.
- “ And we say “we must check this is well-defined” and take a sip from our snifter of brandy and look all self-important... Wait, what am I doing again?
- “ How do you add McMaster to Queen’s?
- “ This is linear algebra, but worse.

**PMATH 351: ALEXANDRU NICA**

- “ Let’s suppose points have feelings. Then a particular point will be “pleased” if...
- “ Thank you for coming to class today. I see that I am less and less popular as the term comes to an end.

**STAT 231: JACK DAVIS**

- “ Nobody is gonna complain they got an extra McNugget. Nobody goes in and complains where they shouldn’t... Snitch.
- “ So landlines are like cellphones that are attached to the house, but they have like no games on them. Terrible, terrible pieces of technology.

**STAT 333: SURYA BANERJEE**

- “ So corruption is nothing but a pay-all auction. It can be modelled mathematically.
- “ It’s just some algebra. Let me write it down anyways in case you guys love pain.
- “ Apparently, some people in the Prussian Army died from horse kicks in a Poisson process. Accidentally of course. The horses weren’t rising up against us.

- “ Let’s say you’re sitting around waiting for an earthquake.
- “ I have no job and I just sit in front of DC watching trains.

**PMATH 464: RUXANDRA MORARU**

- “ I’m very bad at naming things.
- “ Do not impute onto your students your anxieties.

**CO 480: LOGAN CREW**

- “ The more we try to define mathematics, the more we realize it’s a clusterfuck.
- “ The numbers work, but they’re stupid.
- “ I’m personally depressed when I look at a cubic.

**PMATH 450: BLAKE MADILL**

- “ I may not be able to make coherent sentences.
- “ This board is terrible. It’s like writing in yogurt.
- “ Note: one half plus one half is one.
- “ *[Dips below the podium to tie a shoe]* What if there was a hatch, and I just left?

# WANT TO KNOW WHO WINS MATHSOC'S ORIENTATION WEEK?!

HOME » MATH MATH MATH » WANT TO KNOW WHO WINS MATHSOC'S ORIENTATION WEEK?!

**SPOILER ALERT:**

**DO NOT READ UNLESS YOU WANT TO KNOW WHO WINS THE THIRD SEASON OF MATHSOC'S ORIENTATION WEEK!**

Phew!

And in case you do, **CLICK HERE** to find out who wins!!!!

And the winner is...



Multiple sources close to production of the third season of *MathSoc's Orientation Week* have revealed to mathnews.uwaterloo.ca that **Team Tan-basco** has taken home the title of top Math Team!

Ha! EXCELLENT!

A deserving winner, we'd say!  
Thoughts?? Who do U think should win the competition??

Pi-Res Hiltoun

# BREAKING: GREGOR RICHARDS TO RUN FOR PRESIDENT OF THE UNITED STATES

WATERLOO—In a stunning announcement from the steps of MC, Gregor Richards announces his candidacy for President of the United States of America.

“I’m throwing my hat in the ring!” Richards announced, before literally throwing one of his many hats into the crowd of onlookers, seemingly not understanding that “throwing your hat in the ring” is a metaphor.

The candidate stood in front of a crowd of thousands (although it could have been a small-negative-number sized crowd), and spoke extremely loudly with no microphone about his plans for the future of the nation—but not before a quick tangent about the naming scheme of the nation.

“The states aren’t united! I don’t know why we still call them that!” he declared, waving his arms around. “And I’m not talking about political divisions here, I’m talking about physical continuity! Hawaii and Alaska aren’t contiguous with the rest of the states, so we shouldn’t call them the United States anymore!”

“We *could* call them the Semi-Random Access States of America, but we’re really bad at naming things,” he sighed.

The current Waterloo CS professor/fashion icon went into brief details about policy proposals he would enact should he win the highest office in the stack frame. His first brief comment was about the approaching impact of AI upon several industries critical to the economy.

“AI is great!” he proudly proclaimed. “I’m coming out as the first candidate to be proudly anti-squishy ape brains. I’m the only one brave enough to do it.”

He also detailed his plans to tackle the ongoing immigration debate. “We should just locate the United States’ address in memory, then save it in a register and allow potential immigrants to simply *\$jalr* to our great nation.” Richards did not mention the creation of a procedure to move those people to a new city/area of memory, which would presumably be funded by the taxpayers.

Further proposals include a plan to convert the interstate highway system into a DFA (“there’s no loss of travel power!” he proclaimed), as well as a suggestion to convert the American Nuclear Warning System from a siren to a recording of the future President saying “BAAAAAAAAAAD MORNING!”

His competitors for the office have already started to take notice of Richards’ candidacy. Joe Biden was spotted through a White House window trying on a neon green suit, and advisors to Donald Trump have been trying to explain to him what a compiler is. Ron DeSantis, meanwhile, was busy not being a serious candidate.

Students surveyed at the scene were enthusiastic about their professor’s chances. “You know, the President is a man who needs to wear many hats,” a second year Computer Science student, Vivek Goel, pointed out. “And having taken Gregor’s CS 241 class, I know he can do it.”

The candidate left without talking to journalists. The campaign later stated that Richards had asked for “any questions?” but it was in a voice so quiet that no one could hear.

**mathNEWS Political Correspondent Team**  
(Dick Smithers, no pun indented, molasses, and The Stickyman)

## N WAYS I HAVE DIED IN TEARS OF THE KINGDOM

**GOT THE GAME YESTERDAY AND AM STILL ON THE GREAT SKY ISLAND, FOR CONTEXT**

- Fell off an island at my very first opportunity
- Fell off it again only a few seconds after reloading
- Failed to flurry rush an extremely telegraphed attack (I played *Breath of the Wild*, I shouldn’t be so bad at this!)
- Tried to manipulate two floating platforms one at a time to reach a destination and fell
- Fell in freezing water
- Burned to death as an enemy set a tonne of grass on fire, committing suicide to take me out as well
- Misjudged a jump distance (I’ve done this like a dozen times tbh)
- Fell off a thin rail multiple times while attempting to walk across it
- Got myself stuck on a platform with no easy way off and fell to my death multiple times while trying to figure out a way back... oh, and this whole situation repeated itself within the space of half an hour!

It’s a fun game and all... but it’s punishing to have to reload saves all the time... guess I’ll have to simply get good. :)

Predap

## HYDRATE

**THANK YOU FOR READING THIS FAR**

Hello fellow reader,  
Current objective: get a drink of water  
Thank you and have a good day.

AHpatche

# I BORROWED A SCIENCE FICTION POLITICAL THRILLER FROM A CLOSE FRIEND; YOU WON'T BELIEVE WHAT HAPPENED NEXT!

I've struggled with reading for the past few years. Until the beginning of grade 11, I used to read like *crazy*; I always had a book in my backpack I was working through. But then, increased extracurricular responsibility, university applications, and cram school for Indian colleges meant that, for two years, I had zero time to read. For all of grades 11 and 12 the only thing I read were textbooks, textbooks, API references for the occasional hackathon, and textbooks. First year came and went, and the only books I read were the ECON 101 textbook before I discovered the slides were enough, and the Harry Potter books for ENGL 108P<sup>1</sup>.

By the time the first co-op hit, I tried to read something new and realized I had completely forgotten how.

That's not to say that I haven't read books since then... I'll still read anything that a course or co-op requires me to—the most recent example being RFC 4787<sup>2</sup>—and I've often tried (and occasionally succeeded) in finishing books for leisure. But it's almost always been something I've had to push myself towards, not something that happens automatically.

I miss the days when I would just crack open a cold book, lie down in the most uncomfortable half-fetal-half-acrobatic position on a sofa, and read until 3 AM when I'd realize I had to wake up in three hours for school. I miss getting so lost in a book that I could visualize the scenes, hear the characters, feel the tension, take sides in the drama, and be unable to put the book down until it all resolved.

Then a friend lent me a copy of *Foundation* by Isaac Asimov.

Asimov was a great guy—he's probably one of the top N science fiction authors of all time, for very small values of N. My first introduction to him was when, for school, I read a Hindi translation of *The Fun They Had*: a short story he wrote about a pair of kids who've only learned using robot teachers discovering an honest-to-goodness book for once<sup>3</sup>. Then, when I was in 7<sup>th</sup> and 8<sup>th</sup> grade, I read a *whole* bunch of short stories by him, which I just found in text form online, and I still remember *The Bicentennial Man* and *Nightfall* fondly. Heck, I even bought a copy of *Foundation* to read online, but *somehow* rather than buying the book itself I bought a transcription of the BBC radio adaptation<sup>4</sup>...

So I was pretty excited to actually read the book that I had meant to read so long ago, by an author who I'm so fond of. And that started off pretty innocently, with me reading the first chapter or two and then putting the book away for months as my attention got distracted by other things. Typical for me. But then a few days ago, I picked it up again.

I had to reread the first chapter, but that was fine because it was just a few pages. I nearly bored myself into putting it down

again, but I persevered for the few pages it took for the plot to start. And then I was hooked.

I think I read 80% of that book in the span of 40 or so hours. That might not sound like a lot, but:

1. This has been the first time in *ages* that I've been able to focus on written material for more than five minutes at a time.
2. It did the thing! It had me stay up until 3 AM reading without even realizing.

Needless to say, I'm over the moon. In all my excitement, I acquired a copy of the second book in the series, *Foundation and Empire*, from the Dana Porter library, within hours of finishing the first one. I'm working through it now and having just as much fun as I had with the first one.

I'm so glad the magic is back.

tendstofortytwo

1. I know, I know... This was before I got to know what JKR had become, and the course itself played a huge part in me realizing her prejudices as they were embedded into the books.
2. <https://datatracker.ietf.org/doc/html/rfc4787>
3. Funny story: for some reason, since I knew Isaac Newton was a person, and that short story in my textbook was attributed to आइज़ैक असमिोव, I thought that "Asimov" was just someone English-to-Hindi-translating the last name of Newton for the longest time. I'm not sure when I realized that they were different people...
4. Why do they even sell those?! I don't get it...

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## EPISODE 59: AMORTIZED ANALYSIS

Enjoy Episode 59 of the MathSoc Cartoons series: [CS.136—Amortized Analysis!](#)

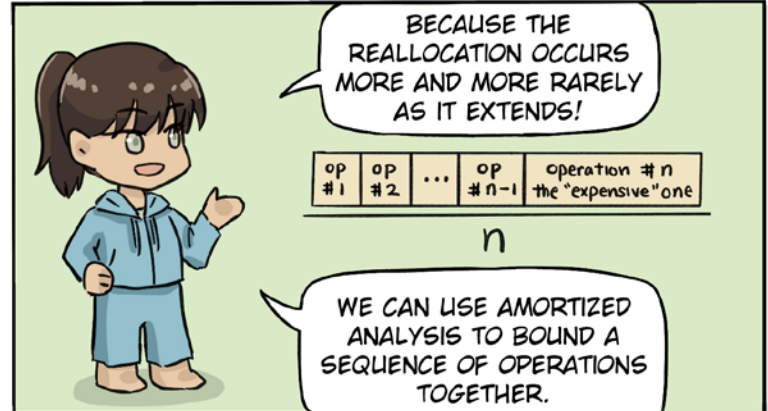
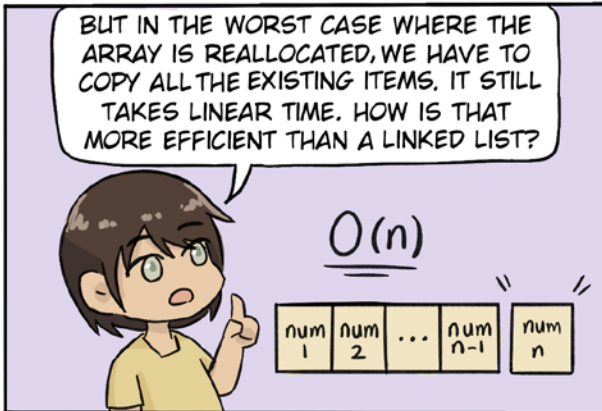
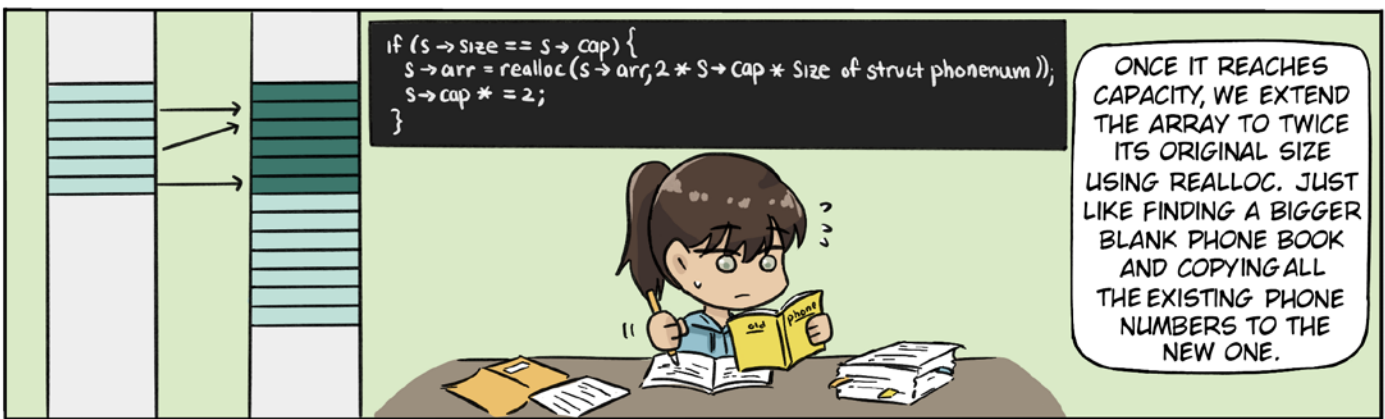
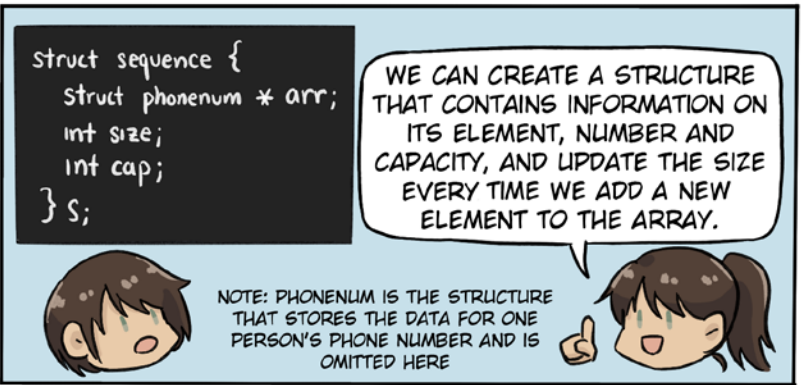
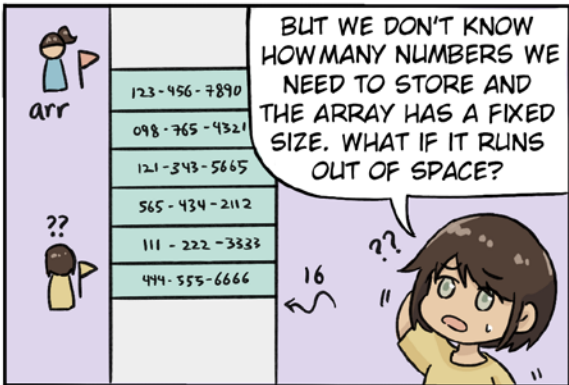
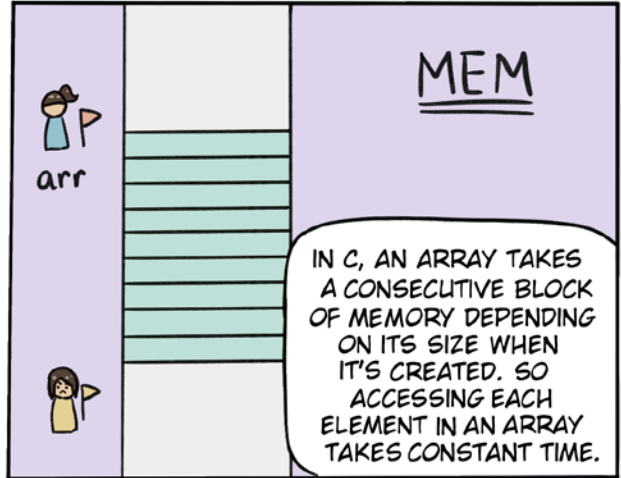
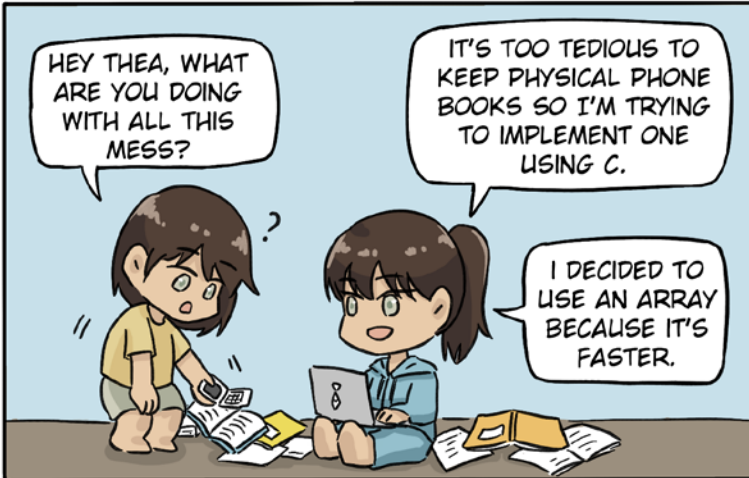
Want to see the next comic BEFORE it's released and provide feedback to help us out? Sign up anytime to be a reviewer at <https://bit.ly/mathsoc-cartoons-reviewer-signup!>

Want to see the next comic when it's released? Follow @mathsoccartoons on Instagram and Facebook!

As always, feedback, suggestions, and fan art can be left on the MathSoc Cartoons channel in the MathSoc Discord server or sent to [cartoons@mathsoc.uwaterloo.ca](mailto:cartoons@mathsoc.uwaterloo.ca).

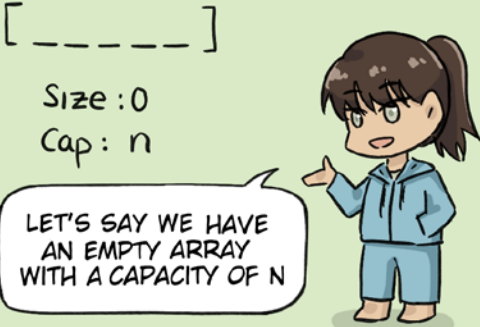
# CS 136 - AMORTIZED ANALYSIS

STORY BY: CHUNXIN ZHENG  
ART BY: LISA WEI





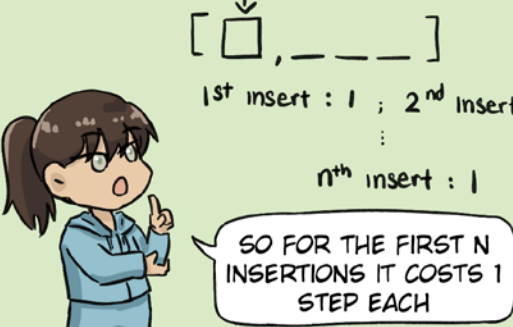
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[ ]

Size : 0  
Cap : n

LET'S SAY WE HAVE AN EMPTY ARRAY WITH A CAPACITY OF N



[ □ , \_ \_ \_ ]

1<sup>st</sup> insert : 1 ; 2<sup>nd</sup> insert : 1  
⋮  
n<sup>th</sup> insert : 1

SO FOR THE FIRST N INSERTIONS IT COSTS 1 STEP EACH

AND HERE COMES THE CASE THAT COSTS N+1 STEPS FOR ONE INSERTION

|             |           |
|-------------|-----------|
| n inserts   | n steps   |
| n+1 inserts | n+1 steps |

Capacity : 2n

YES! AND SINCE THE CAPACITY IS EXTENDED TO 2N, WE CAN NOW INSERT ANOTHER N-1 ELEMENTS AT A COST OF 1 STEP EACH.

So the total number of steps is:

$$\begin{aligned}
 & 1 + \dots + 1 + n + 1 \quad \left. \begin{array}{l} *n \\ \end{array} \right\} \text{cap} * 2; \\
 + & 1 + \dots + 1 + 2n + 1 \quad \left. \begin{array}{l} *(n-1) \\ \end{array} \right\} \text{cap} * 2; \\
 + & 1 + \dots + 1 + 4n + 1 \\
 & * (2n-1) \\
 + & \dots
 \end{aligned}$$

IF WE CONTINUE TO LIST THEM OUT, WE CAN ACTUALLY FIND SOME PATTERN HERE

$$+ 1 + \dots + 1 + 2^m n + 1 \quad \left. \begin{array}{l} * 2^{m-1} n \\ \end{array} \right\} \text{cap} * 2;$$

So for  $2^m n + 1$  insertion of elements, we have

$$\begin{aligned}
 & n + n + 1 + n - 1 + 2n + 1 + 2n - 1 + \dots + 2^{m-1} n - 1 + 2^m n + 1 \\
 = & n + 2n + 4n + \dots + 2^m n + 2^m n + 1 = (1 + 2 + 4 + \dots + 2^m) n + 2^m n + 1 \\
 = & (2^{m+1} - 1) n + 2^m n + 1 = 2^{m+1} n + 2^m n - n + 1 = 3 \cdot 2^m n - n + 1
 \end{aligned}$$

Steps in total

So for each insertion it takes  $\frac{3 \cdot 2^m n - n + 1}{2^m n + 1}$ , that's 3 steps as  $m \rightarrow \infty$ , so it takes  $O(1)$  time!

FINALLY... THE PHONE BOOK IS IMPLEMENTED AND I CAN GO TO BED NOW.

NOW WE CAN HAVE AS MANY NUMBERS IN THE PHONE BOOK AS WE WANT!

# RATING ALL THE MOVIES I'VE WATCHED THIS MONTH

## THEY ADD UP

### MEMENTO

Loved the narrative structure. Entertaining. Not too relatable. Not a lot of re-watch value. 7/10.

### BATMAN BEGINS

I could've sworn I had seen this one before, but everything seemed completely fresh to me. Pretty good Batman film. I think Batman (2022) did the origin story better. The villains were very interesting. 8/10.

### THE DARK KNIGHT

The most disturbing Joker character in all the Batman and Joker films. Dude had supernatural skills on god. Great movie. 10/10.

### THE DARK KNIGHT RISES

Somehow I already forget what this movie was about. The prison thing was cool I guess. The plot twist at the end was cool too. But I think the stakes were way too high in this film, which ended up making it worse. I think it tried to be like The Dark Knight Returns (comic), but not as well-executed. 7/10.

### THE LEGO BATMAN MOVIE

It was pretty funny and entertaining. I liked how it deconstructed a lot of Batman personality stuff in a way that makes sense to children. 8/10.

### BATMAN (1989)

For some reason I didn't like this. But I think it's because I was expecting it to be a Nolan-like movie. I think it will actually be pretty good on a re-watch. The aesthetics were OG goth (think Dracula). That was pretty neat. 6/10.

### BATMAN RETURNS

Haven't finished this one yet. Tentatively let's say it's 10/10.

### TITANIC

Much better than I thought it would be. Almost perfect movie. I didn't like the layered modern narrative, I don't think it added anything. Very heartfelt and sad film. Jack has swag. 10/10.

### Y TU MAMÁ TAMBIÉN\*

The most misunderstood movie in this list. Before I started watching, all I knew about the film was that there are some weird sex scenes. I walked away with chills. Perfect movie. The narrative structure really touched me. Please watch this. 10/10.

### ROMA\*

Watched this recent movie from Alfonso Cuarón because the previous one was so good. It did not disappoint. The saddest movie I've watched in a long time. But also so beautiful. The cinematography is unlike anything I've seen that was made post-1970. 10/10.

### THE PRESTIGE

We didn't finish this because it was too scary. ?/10.

### BABY DRIVER

It was alright. It's disquieting to see Jon Hamm in anything that's not Mad Men. 7/10

### THE ASSASSINATION OF JESSE JAMES BY THE COWARD ROBERT FORD

This is an old western legend and the name of the movie gives the plot away. And yet, it is one of the freshest western's I've ever seen. I totally recommend it if you're at all into westerns. 9/10.

### NO COUNTRY FOR OLD MEN

Another great western. What's interesting about this film is even though it was set in the 1970s, it could easily have taken place in the 1880s, which is why I still consider it a western. The main Villain was on the same level of terrifying as Heath Ledger Joker, which is to say, pretty terrifying. 9/10.

### SPIDER-MAN: INTO THE SPIDER-VERSE

The visuals were so good that they convinced me to buy a real comic book. I don't remember the plot but it was good. Miles Morales has swag. 9/10.

### SPIDER-MAN: ACROSS THE SPIDER-VERSE

Pretty good still! But honestly I hate the whole multiverse thing. It's been done so many times by Marvel. The first movie kept it low-key but in this one it was center-stage. But, still, it had a fresh twist on it. 8/10.

### ASTEROID CITY\*

What's the point of making movies anymore? Wes Anderson has crafted the perfect film. 10/10.

### ISLE OF DOGS (I LOVE DOGS)

Walter white goes hard on this one. I loved the visuals. The movie (which is a claymation) left me with a newfound appreciation for dogs. Watch this if you love dogs, or if you don't, but especially if you do. 8/10.

**FANTASTIC MR. FOX\***

Another Wes Anderson claymation. Even more charming than Isle of Dogs, which, given the circumstances surrounding me and my friend's when we watched this film, is a really good thing. Great movie. 9/10.

**TRUE STORIES\***

I love Talking Heads. I love David Byrne. He made a movie. This is it. It's a movie you watch alone if you're a David Byrne fan. I really liked it. It made a lasting positive impression on me. It's a weird goofy funny movie that also makes you want to dance. I'm gonna give it a 10/10.

**PAST LIVES**

Perfect movie. As an immigrant, I related a lot. Not with the story itself but with the overall vibes surrounding identity and immigration. It's playing at Princess Cinemas. Go watch. 10/10.

**WARM BODIES**

Recommended by our priest, which is funny. It's the weirdest Zombie movie I've ever seen. I actually liked it! It's also like the least scary Zombie movie ever. 7/10.

**NIGHT OF THE LIVING DEAD**

Literally the first Zombie movie. It's crazy how many things this movie has introduced into the universe. The blueprint and the map for for all zombie movies to follow. It was scary and charming. I fucking hated the ending. 7/10.

**AIRPLANE!**

It was really funny but I think it had too many jokes per minute. The strat here was to have as many jokes as possible, and if some of them don't land, it's ok. It works but it makes you feel cheated on. 7/10.

**BLACKBERRY**

I expected something like the social network, but this is nothing like it. I liked it quite a lot though. We should have more movies making fun of tech. The soundtrack was banging. There was a shot of Waterloo which had the Icon towers in it though, which probably didn't exist in the early 2000s. By the way, if you like the history of smartphones, you should check out the General Magic documentary (it's on YouTube). 8/10.

curdish

Stars mean "please watch this!"



# I THINK THE MACDONALD TRIAD IS A POOR INDICATOR OF VIOLENT TENDENCIES

For those unaware, the Macdonald Triad consists of three factors, the presence of which in a child is supposed to predict serial violent tendencies later in life. Now, I'm no child psychologist or criminal psychologist,<sup>1</sup> but I think that these indicators are a bit silly.

Indicator one is persistent bedwetting past the age of 5. How can you tie this to violence? It's completely random. Like, is the theory that, because a child can't control their bladder, they cant control their urges to murder? That doesn't make any sense. Indicator one is dumb.

Indicator two is obsession with fire-setting. This one might seem a bit concerning, especially when phrased like that, but children love setting fires. I used to work as a camp counsellor, and campers would argue and debate and fight over who got to light the campfire. Children simply yearn for the flames. Who can say why? Maybe the heat and crackle of the fire makes them wonder what would happen should those flames start to lap away at human flesh. Either way, not that weird.

Indicator three is cruelty to animals. What kid hasn't inflicted horrific pain onto a small creature? What kid hasn't watched it twitch in incomprehensible pain? Heard it whimper and cry until it no longer held the breath to do so just to sate their curiosity? Prodded it and pulled it apart, bit by bit with sharp edges, and felt absolutely nothing but perhaps a slight bit of revulsion at how on the inside, humans and animals are the same mass of blood and organs. Felt that this was gross, and cleansing was in order. Felt that a world razed by flame would be a cleaner one than the one in which we currently live. Felt like they'd show them all, especially the ones who'd laughed when they'd wet the bed, just how disgusting they all were. They'd all see. And then they wouldn't. Not in my clean new world.

aphf

1. I am not a child or a criminal

## OPERATING HOURS

**S23: MONDAYS TO THURSDAYS, 8 AM-5:30 PM,  
FRIDAYS 8 AM-4 PM**

Is the Math Coffee  
And Donut shop running? You  
better go catch it!

A MathSoc Sez Heading

# DESCRIBE HOW CONCEPTS AND SKILLS TAUGHT IN PD XY THIS TERM ARE TRANSFERABLE TO DIFFERENT CONTEXTS (100–500 WORDS)

485 WORDS

*There are many concepts and skills taught in PD XY that I have learned this term which I believe can be transferred to a variety of different contexts—who am I kidding? I don't want to write it, you don't want to read this, and neither does the TA.*

Intended to be a line of courses to help “students enhance their professional skills while completing their work terms,” Professional Development (PD) courses are constantly labelled by students as *stupid* or *useless*, often prefaced by some colourful adjectives. Perhaps the problem isn't the courses but rather our understanding of what is meant by *professional skills*.

Here is how PD XY enhanced my professional communication skills which I can confidently apply to any workplace.

## CORPORATE JARGON 101 — USING MANY WORDS TO SAY VERY LITTLE

For unknown, perhaps even sadistic reasons, questions on PD assessments commonly impose word counts ranging from 100 to 500 words. Yes, that's 99–499 too many. Yes, it's a total time drain for me writing it and the poor TA who has to read it. Yes, it's a waste of words. Yes, it's a waste of energy and electricity and doesn't that somehow contribute to the climate crisis or something, and now I'm freaking about the icecaps and drowning polar bears and forest fires and—

The challenge of these assessments is not to say anything smart or meaningful, but to give the illusion you are. It shouldn't be possible to stretch any reasonable answer to “describe how your work or volunteering experience helped you better understand a PD XY concept” to anything longer than 3 words:

*It did not.*

But it's possible! Let's answer this question differently:

*Over this past term, I worked as a [redacted] at [redacted]. In PD XY we covered a variety of different concepts and ideas such as [redacted for the sake of the reader]. As a [redacted] at [redacted], my roles and responsibilities included [redacted]. One of the PD XY concepts I best understood over the course of my position as [redacted] was [insert a PD XY concept copied from course outline here... don't look too hard].*

Then, feel free to talk about work, what you did, etc., taking creative liberties as necessary.

I argue that this is no different than what happens in the workplace. For example, when your manager sends you an email when a Microsoft Teams message would have been more than enough.

*Deborah, can you send in the meeting minutes by noon today?*

is easily turned into,

*Hello Deborah,*

*Following up on today's meeting regarding [redacted], it appears that I do not have the minutes from that meeting. The team and I would greatly appreciate it if you could send them over to me by noon today or at your earliest convenience; no need to cc anyone else I'll handle it from there.*

*Please advise.*

Deborah's response could have been two words: *F\*ck off.*

But thanks to PD XY, she knew how to stretch it a hundred-fold.

rakata

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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# PAS 1241 TEACHING AND LEARNING SPACE

## UW REVIEWED 5

I have one of my first courses at university here, a small lecture room crammed with rows of desks too close to each other. The student standing at the podium at the front of the classroom now is introducing himself. I lean to the side so the giant post in the middle of the room isn't blocking my view. He looks friendly, a bit hipster-ish, and he says, "My favourite band is The Mountain Goats. You've probably never heard of them."<sup>1</sup>

I *have* heard of them. But that's all. I go home and listen The Mountain Goats *extra hard*.

I have one of my first courses post-lockdown here, a small lecture room with movable tables arranged in circles. My prof stands in the middle of the room, where he can easily make eye contact with all of us. We go around presenting our favourite poems—it's a poetry class. Mine is "Having a Coke with You" by Frank O'Hara. I love the imagery in this poem, and the rhythm.

Someone picks a pop song, another presents rap lyrics. I didn't know we could do music. If I'd known, I might have done "Dance Music" by The Mountain Goats. I have a lot of favourite poems now.



PAS 1241 is on the bottom floor of PAS, easiest to get to through the mental health lab doors even though you aren't supposed to use them, and it was renovated sometime in 2019 or 2020 by the Teaching and Learning Spaces Operations group, whose goal is to create flexible and inclusive classrooms at UW. I've had a total of three classes at PAS 1241, one before the {renovation, lockdown} and two after.

I didn't remember the old version of this classroom when I came back to campus. In my dreams, all my SPCOM 100 lectures took place in the new classroom, well-lit and airy. Only until I happened upon a webpage describing the renovation did the real memories come back. Including that one with the The Mountain Goats guy.

I've heard a lot of students complaining about the rooms their classes take place in, rooms in MC basement, RCH, DWE, all the old engineering buildings I guess. I've heard complaints about PAS itself as well, but PAS 1241 is now a nice classroom. It's easy to walk around in, and the desk arrangement promotes class discussion and socializing with your neighbours. No windows, but the overhead lights are the kind that don't bother me.

Some people, particularly in the Math program, wonder if their university experience would have seemed less depressing if their classes had all taken place in better classrooms. I reckon the answer is no. I've had lots of courses in these supposed nice rooms. Maybe the first lecture is more digestible, more hopeful. A few weeks in and I'm suffering

again, deep in tunnel-vision, shallow breathing, feeling like the ceiling is going to crush me no matter how high and spacious it is. I am not particularly fond of going to class, even if I enjoy the subject matter.



So as much as I appreciated the classes I'd taken there, it's just another classroom to me. I can't shake those painful memories out of my head. Still, I have to give it some credit, as the place where I found my love for poetry again, and where I rediscovered The Mountain Goats. Classrooms are where I struggled most in these five years, but PAS 1241 is the one where I was closest to finding an answer to it, a cure to all this monotony and dreariness and torpor: art, writing, music, which carry me through academic and co-op terms alike. It could have happened anywhere, but it happened here.

cy

1. If this is you: Thank you.
2. "PAS 1241 used to have four rows of movable tables facing the front of the room, which had a raised dais with an instructor console and whiteboard to clearly signal the front of the room. The room also contained one pillar that obstructed the view of the front of the room for some students. This room was repurposed as a flexible classroom space, including tables that can be reconfigured into pods of different sizes or rows, movable chairs, multiple whiteboards around the room to enable group work, digital screens, and a centrally located instructor console." Excerpt from <https://uwaterloo.ca/teaching-learning-spaces/pas-1241>

## BAD GAME DESIGN

So, you know the general structure of drinking games, right? Like, there's some activity that requires some non-trivial amount of focus and skill, and if you fail, you have to drink?

At first glance that seems stupid bc like if you're drunk, you'll fail and get caught in a loop and then die of alcohol poisoning, which is generally regarded as a bad thing in fun games with friends. However, people who play these games want to get drunk, so maybe the real game is finding a balance between being drunk and being drunk enough that the game will force enough shots into you that there's no room left for your soul and you fucking die.

Maybe teetering on the edge of death is the real game.

Anyways the actual bad game design is that I have to submit an article to get pizza but I have absolutely no interesting thoughts about anything ever, but I want the pizza so I have to subm—

## WHY THE DC-10 WAS SO DEADLY (PART 2)

In the last issue, I discussed the conditions in which the DC-10 aircraft came about. A rush from McDonnell Douglas (or MD) and Lockheed to release a large aircraft that could fit between Boeing's 707 and 747. This rush caused the DC-10 to be released ahead of the Lockheed L-1011, which was going through a troubled development.

The DC-10, however, was plagued with a faulty rear cargo door that failed during a ground test in 1970, which was not corrected. Then, in 1972, American Airlines Flight 96 would lose its cargo door over Windsor just after taking off from Detroit. Luckily, no one died, and pilots Bryce McCormick, Page Whitney, and flight engineer Clayton Burke, nursed the plane back to Detroit for a safe landing, despite the degradation in flight controls.

During the NTSB investigation of AA96, they found that the closing mechanism of the rear cargo door was not fully closed. For some reason, the electric actuators had a habit of stopping before the hooks were fully locked. The locking pins that were meant to confirm that the hooks were locked in could be bent if enough force were used on the handle (the cargo handler used his knee in closing the handle), and so the handle to the door could be put in without the hooks being in the closed position.

American Airlines had a hand in this accident. Had the cargo door locking mechanism used hydraulic actuators, the cargo door would've *appeared* locked via friction, but it would've opened again during pressurization, as a hydraulic actuator would've gone back into the unlocked state if it hadn't completed its locking. An electric one would stay in its "in between" state, which can cause the issues that AA96 went through.

Here's a weird quirk in aviation safety. The NTSB investigates and recommends things, but the FAA is the one that puts in the laws and enforces them. While there are good reasons for this separation, it does mean that the NTSB cannot enforce any of their recommendations, and has to ask the FAA.

The FAA has a tool called an Airworthiness Directive (or an AD). This is basically a requirement by all operators of a certain plane type to do something, and they must do it according to the guidelines, or else the plane cannot legally fly. However, despite the FAA folks on the ground drafting an AD to force MD to fix their doors and floors, the top FAA folks wanted to make an agreement with MD. After all, an AD so early into the DC-10's life would be a reputation disaster! Also note that the head of the FAA was a Nixon lackey who was all pro-business.

This "gentleman's agreement" would have MD serve three "Service Bulletins" (or SBs), which are basically recommendations from the manufacturer to do something to the planes. This isn't a legal requirement, and has less weight in aviation maintenance. The three SBs said to:

1. install a peephole to let ground handlers check if the hooks were locked in;
2. install a sign to tell ground handlers about what to see and expect when looking at this peephole; and
3. install a support plate to make sure the locking pins cannot be bent with enough force. No SBs were made about the floor.

This brings us to Turkish Airlines. MD was desperate to get them to buy their planes. They were expecting to sell some DC-10s to ANA, but Lockheed bribed ANA to buy the L-1011 instead, so they had some planes but no buyer. These planes were built before AA96, but were bought after the SBs were implemented. So, these planes should've had the SBs implemented. They had the first two, but not the third, despite having documentation that they had them. No FAA oversight meant that no one knows how these planes got to Turkey without plates. The engineers that supposedly put their actual stamp of approval on the documents did not remember using their stamps, nor did they remember putting on the plates.

Moreover, unauthorized modifications were made to the planes so it would be even easier to close the handle without the hooks being locked in place. No one knows who did this.

So, on March 3<sup>rd</sup>, 1974, Turkish Airlines 981 (THY981) crashed during a flight from Paris to London (the flight was an Istanbul-Paris-London itinerary). Why? Well, the plane was filled up in Paris because of some strikes going on. The ground handler in Paris couldn't read the English-Turkish warning about the peephole as he didn't speak those languages. The hooks didn't lock, and he closed the door without any trouble, both because of the lack of plate and the modifications.

When the plane reached 11,500 feet, the rear cargo door blew off. The floor collapsed even harder than in AA96, as it was a packed flight. People were blown out, control cables were severed, and the pilots lost control of the plane. They crashed into a forest, killing all 346 on board: the deadliest accident in aviation at the time, and still one of the deadliest today.

MD would get sued to the moon and pay huge settlements. The DC-10 would get a bad reputation, and MD would suffer from less money made from the DC-10 than expected. MD would merge into Boeing in 1997. The FAA would serve a bunch of ADs to get MD to fix the doors and floors after THY981. The DC-10 would never have another cargo door open ever again—but it came at the cost of 346 people.

We in the aviation community call this "tombstone technology." Though we learn from our mistakes and make aviation safer, companies usually only make things safer when enough people die. The MAX MCAS problems, wiring issues in planes, procedural deficiencies in the cockpit, ATC, and maintenance. All done because no one died, and only fixed when enough people did die.

# A REVIEW OF ANDREA DOUGHTY'S "A FLIPBOOK OF BIRDS"

"A Flipbook of Birds" is perhaps one of the most influential novellas of the 20<sup>th</sup> century. At only 13 pages long, the novella packs an immense amount of emotion and story into a seemingly impossibly small number of words. While ostensibly a guide to the birds of Southern California, it is in reality an incredibly compelling autobiography, unknowingly documenting Doughty's journey from obscurity to stardom.

Prior to achieving fame through "A Flipbook of Birds," Doughty's life was marked by melancholy and missed opportunities. Born as the middle child in a small town west of San Francisco, her family, while not destitute, often struggled to make ends meet. She modestly claims to have been mediocre in most school subjects, except English, and found herself working odd jobs to support her supposedly more academically talented brothers, Andrew and Ryan. While some jobs brought her joy, such as her cleverly described stint as a medieval faire vendor, labelled "Wren; fair" to match the book's theme, she still felt trapped in a "wake of mediocrity," akin to both the turbulent waters created by a boat and the sombre resignation of a funeral.

Her final, and longest, job before writing her memoir was as a bird bander for the American Birding Association, where she spent five years from 1962 to 1967. Here, she encountered Sei Liu, an elderly immigrant from Hong Kong with a touching life story of her journey from Ap Lei Pai to San Francisco. Liu's influence spurred Andrea to abandon her stable job and pursue her true passion — writing.

Throughout her book, Doughty reflects on her "unattainable desire to become lionised" and how this yearning shaped her life. In an act of defiance against an organisation that she felt had stolen five precious years of her life, she took the bold step of writing "A Flipbook of Birds." However, this shift in her life's trajectory was not without challenges. Leaving a stable job to pursue writing full-time was an incredible leap of faith, and her family strongly disapproved. Yet, with her brothers long graduated, their attempts to guilt her into another dead-end position held little sway. The novella ends poignantly with her realisation that she was "afraid of the obscure, but even more afraid of obscurity." In a later interview with Ellen in 1999, Doughty would candidly discuss her fears and the imposter syndrome that accompanied the wild success of her book, going so far as being worried sick that one day she might wake up to find it was all just a dream.

In conclusion, "A Flipbook of Birds" is a remarkable novella. Andrea Doughty's journey from obscurity to literary acclaim is both inspiring and relatable. With evocative language and powerful metaphors, this short yet impactful read is sure to be remembered for years to come. Highly recommended.

For interested readers on-campus, copies of "A Flipbook of Birds" can be found on the 11<sup>th</sup> floor of Dana Porter.

Spud Money

## OPTIMIZATION! GOTTA CATCH 'EM ALL

At Waterloo, maybe you guys have heard about the "big" groups of courses that people always talk about taking. For example, we have the big 3 in CS, the little 5 in CS, and the analysis sequence in PMATH. In C&O, we also have the collection of the optimization Pokemon that are very cool and can't be missed if you enjoy mathematics.

Today, I will give you a quick walkthrough of how to catch all of them, they're all pretty rare.

1. CO 450: Combinatorial Optimization. Only offered in Fall terms. This is one of the biggest fields in optimization, which is related to what you learn in MATH 239 — especially graph theory.
2. CO 463: Convex Optimization. Only offered in Winter terms. If you enjoy calculus and analysis, it won't hurt to try this course!
3. CO 466: Continuous Optimization. Only offered in Fall terms. This is one of the most useful and applicable courses for industry, especially machine learning. Do you want to know why ML algorithms

are designed how they are? Better not skip this course!

4. CO 471: Semidefinite Optimization. Only offered in Spring terms. This is the most interesting one in my opinion. It demands knowledge of both linear algebra and calculus. You'll see how a single cool matrix can be used to solve so many hard problems in statistics, big data, and even other fields of optimization.

**Additional advice:** I recommend taking one optimization course at a time to enjoy the beauty of optimization (honest comment: they are all hard but very fun, so take your time).

**Remark:** You will be able to collect all these optimization courses in your study terms if you've taken CO 255, as other prerequisites can be overridden easily — CO profs are much more lenient than CS profs when it comes to overrides. It's known as a hard second-year course, but it's a very good introduction to the optimization Pokemon courses!

# HOME LEFT ME

sometimes i go back to the city i grew up in and get asked  
what was it like leaving home?  
and i don't have an answer



my school was small, and every year it shrank  
it wasn't an amazing place, and the city was dangerous,  
but the cafeteria made these massive cookies that only cost a  
dollar  
and every may they brought food trucks onto our shitty  
football field and i got to have beavertails  
which mom never wanted to get when we were out  
so i had an okay|good time, i think

i got lucky, other people had it worse

one day we walked out of that building together and we didn't  
know we weren't all coming back  
and i'm sure i saw people that day that i will never see again  
but i can't tell you their names or their faces  
which is probably worse|better for me

i had big plans, of course, and i tried my best to make  
everything happen anyways  
never got a prom or a license but i did manage to light the  
lights and put on a show, in the end,  
while swimming against the tide

i got lucky, other people had it worse

i lost friends and made new ones  
too stubborn not to embrace the new routine, too stubborn to  
let go of the old  
each day oscillating between screen one and screen two  
trying my hardest not to make noise, not to laugh|scream too  
loud  
there are three other people who need to focus  
so i stayed as small as i could  
out of respect|generosity, i think

i worked from a desk where i could see the painting in the hall  
i never quite understood  
and whoever was in the kitchen  
and then, one day, we packed a bunch of clothes in the car  
and drove  
and suddenly i work from a desk where i can see a library that  
looks like a perfect cube  
a shape i find amusing, for a while

we never got to say goodbye  
congratulations  
can you remember when?  
we logged off one day in one place and logged in the next day  
somewhere else  
not slowing down  
thrown from one city|world to another

i didn't break much when i landed  
more than i can say for most people i know

i got lucky, other people had it worse



sometimes i go back to the city i grew up in and get asked  
what was it like leaving home?  
and i don't have an answer



my playlist has songs on it from people i can't talk to anymore  
that i stole from the stereos in their car  
driving nowhere|everywhere

i spent so long trying to keep my head above water that i  
almost forgot to breathe  
almost lost everyone  
only lost a few people  
which is not bad, all things considered

i got lucky, other people had it worse

there's a girl who i knew  
who knew everything about me  
and i knew most things about her  
i knew about her bird who was a bastard and bit people and i  
never got to meet  
i knew about her boyfriends and how they met|argued  
she knew how i was trying really hard  
probably too hard  
and i was sure we had shared so much with each other  
that we were tied|stuck together  
that's what she told me  
exact words

now what am i supposed to do with all of this  
i can't put it anywhere

i have friends|family, people i like who like me  
people who make me laugh and i can make laugh  
that part's really important

i got lucky, other people had it worse

but i'm too stubborn to let go for real  
and a part of me will always want to have everything  
and a part of me will always wonder if it was me



sometimes i go back to the city i grew up in and get asked  
what was it like leaving home?  
and i don't have an answer





one day i woke up and my parents were getting divorced  
 i had big plans for that day  
 had to light the lights and put on a show  
 but my parents were getting divorced  
 and it felt like that should probably come first

my mom likes to clean  
 my dad does not like to clean

i see my mom sometimes  
 and i go to the room that's mine|empty  
 it's big and the bed is soft and the mirror is a nice touch  
 but there's nothing on the walls or the desk  
 because it gets moved every time she cleans

i see my dad sometimes  
 and i go to the room that's mine|frozen  
 i've read every book lying in the corner  
 and i'm sure i|someone left those socks on the ground a  
 hundred years ago  
 back when my parents still loved each other  
 and it's still there  
 until i step outside to brush my teeth and the desk is gone  
 the one i sat at where i could see the painting in the hall i  
 never quite understood  
 and whoever was in the kitchen  
 the painting's gone too

i got lucky, other people had it worse

they love me  
 and they make space for me  
 but it's not my space  
 y'know?

~

sometimes i go back to the city i grew up in and get asked  
 what was it like leaving home?  
 and i want to say  
 i don't know what that would be like  
 home left me  
 but i don't|can't

lew

## RED ROOM APPRECIATION POST

Some call MC a fortress. You might not know this but, in fact, MC *was* created as a fortress: one to house one of the most powerful supercomputers in the continent, and to protect it against the most harsh conditions—even a nuclear disaster.

Years ago, MC 1061, 1085, 2017, 2054, 2060, 2061, 2062, and 2063—the 1<sup>st</sup> and 2<sup>nd</sup> floor computer labs and lecture halls near the Rock Garden entrance—didn't actually exist! In their

place was once an enormous, bright red, two-story room. The upper half of the room had glass walls so that anyone in the 2<sup>nd</sup> floor hallways could see in. This was the Red Room, and to my understanding, it's half the reason MC was built to begin with in 1967.

The Red Room housed the IBM 360 Model 75: the largest supercomputer in Canada at the time. I've even heard rumors that the entire design of MC's exterior is such that, in a disaster, the outer walls would collapse outward to protect the Red Room at the center. There's actually a huge photo of the Red Room in the stairwell near the Rock Garden—almost everyone has seen it, but not many really process it. This room was *really* important until it wasn't.

Having apparently outlived its purpose, the Red Room was torn down in 1999 and, within the year, was replaced with the rooms we have now. Lame little computer labs. There were **mathNEWS** articles published around that time protesting it, but there probably wasn't anything that could be done.

There are photos of the Red Room online as well as the architects' original blueprints for MC—these were actually the same architects who designed the CN Tower!

**Photos:** <https://ist.uwaterloo.ca/cs/redroom/>  
**Floor plans:** <https://digital.library.uwaterloo.ca/uwdl-4a299fcd-a1d2-44bb-83c7-8b0cc8a79d15/mathematics-computer-building#page/1/mode/1up>

evaluatED

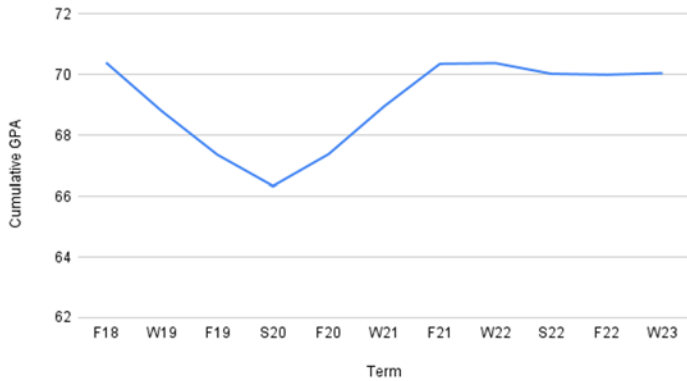
Have you ever been sent an article to publish, but then it turns out it was already published in **mathNEWS six whole volumes ago?**

No, me neither. That would be ridiculous. No one could forget about their work being published in **mathNEWS.**

A DISGRUNTLED mathNEWS EDITOR

# A RETROSPECTIVE OF MY STUDIES

One day, I got a bit curious, and so I decided to make a graph. I took my transcript and plotted my cumulative average to see what it would look like. I was quite surprised by how pronounced the result was. It also gave me a lot to reflect on.



To start, I don't think anything else can show the three phases of my time at UW as well as this graph. There's the pre-pandemic era of my first and second years, then the pandemic's online courses, then the return to UW for in-person courses again.



Pre-pandemic UW was the worst time of my life.

There are way too many bad things involved so I can't go into details here. But one thing was that the learning environment was terrible, and I don't think anyone could've really been able to learn much in my situation. So with that, it didn't surprise me that, term after term, I would notice my average falling, despite my best efforts to do well in my classes despite everything going on in life back then.

The line going down term by term implies that there is at least one course that had a final grade below that line in that term. So I feared the most that eventually my average would drop below 60% (the level needed to graduate with your usual degree)<sup>1</sup> or even fail some courses.<sup>1</sup> Those that personally know me well should know what failing a course implied for me.

I had a realization recently that knowledge is also cumulative, and not being able to learn the topics you need to know well in your first and second year would seriously hinder you in later courses. So, I expected that the the line would decrease at a faster rate as terms progressed, making the descent down below 60% even faster in later terms.



None of that happened however, because the pandemic thankfully started.

I was finally, slowly able to get some sense of stability back into my life. That helped immensely with my studies,<sup>2</sup> although obviously it wasn't immediate. It took about a term or two to get used to it, but I actually got to begin properly learning the topics taught in my courses, as well as learning a bit of the stuff I should have been able to learn in first year. None of the chaos or any of the bad stuff from Waterloo could reach me from half a continent away during these online courses. It was just me and Learn. I was still at a bit of a disadvantage not being able to use online office hours,<sup>3</sup> or not knowing anyone in the courses to work together with, but it was still immeasurably better than the pre-pandemic terms.

You can clearly see the improvement term by term happening during the online terms. By F21 when the return to in-person courses was sadly announced, my average had caught up to where it was in my very first term.

Other good things happened during this time too, such as figuring out what my path to graduating is, and eventually figuring out what graduating would be like. My terrible first year really killed off any inkling of hopes or ambitions, to the point that I remained an undeclared math student for 3 years. I finally had somewhat of a path figured out to graduating, and what goals I wanted to try and accomplish.



I like Vivek Goel less than his predecessor Feridun Hamdullahpur. This purely just comes from the fact that he announced the end of online terms back in Fall 2021. I feared the worst again if I returned back to Waterloo. He announced the return way too early in my opinion. Plus, I had been doing so well with online terms. I was in a groove with an entire system to do the best I could do in online courses. F21 was my proudest term up to that point in terms of both the grades I got and how much I learned from the courses.

I also started preparing for an eventual return. Although, I didn't return to Waterloo in W22 like most others did. Instead, I found the one remaining online math course, AMATH 382, and spent the rest of my time preparing to return. I also found out about other degree plans such as minors or diplomas, so I even got to work on trying to complete those.

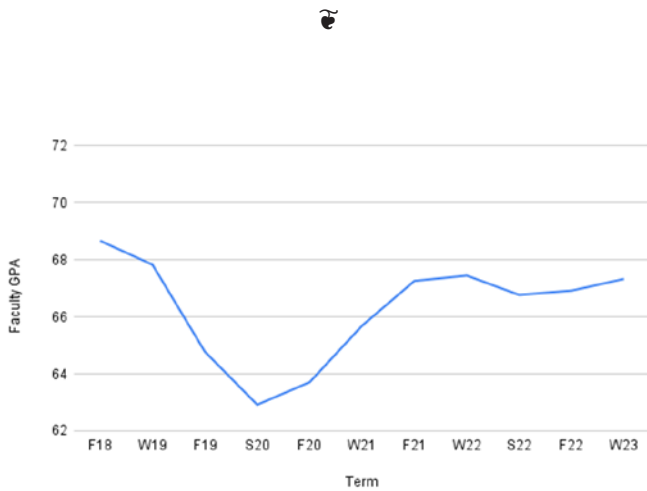
I believe the preparation helped. You can see the line being steady around 70%, only barely decreasing each term. My last term, W23, which I consider to be my best term, was the first term where my average increased for an in-person term, even if it was just by 0.05 percentage points.



Sometimes I wonder what that graph would look like if my first year went well instead. One thing for sure is that I think I definitely would have discovered my interests in pure math and CO much earlier, especially the pure math part. Instead of PMATH 340 in my last term, I could've discovered it in

my first term. It very much feels like a wasted opportunity. Although, it's better late than never. Who knows? Maybe I would be preparing to start my graduate studies by this point. I guess for now I can try to learn group theory on my own, right?

Anyway, I give whatever the opposite of thanks is to David Jao and Kenneth Davidson for their contributions to my first year being essentially destroyed beyond repair with lasting damages for years to come. I wish I had been in MATH 135 and MATH 137 from the start. I wish I can tell my past self about that chance, in hindsight. I missed learning so many fundamentally important things, but that's going to be a future article.



For completeness, I also had the faculty averages plotted too. It pretty much shows the same story. It's the same down, up, then plateau.

If you happen to be worrying about your averages, just know that it can be recoverable. For me, it did take a world-changing pandemic, but it should still be possible. There's nothing wrong with taking just 3 courses a term, or with choosing online courses or easier courses. As long as it can improve your learning situation, it counts as progress.

One last thing I should mention. I could have named this article with the word "statistics" instead of "a retrospective" but there weren't many statistics I could have gone into. You can thank my STAT 230 and STAT 231 for that.

**boldblazer**

1. On that note, I should make it clear that you shouldn't ever fear or feel bad about withdrawing a course and receiving a WD. I had to do it a total of 5 times. In retrospect, I don't regret any of the WDs, and instead I'm thankful that I got a WD instead of potentially actually failing a course.
2. It also helped that I was free from co-op too. That freed up a lot of time, which helped.
3. It's complicated.

# TAKEAWAYS: MATH READY DAY

## OR, TRAVELS INTO SEVERAL REMOTE BUILDINGS OF THE UNIVERSITY

- the university of waterloo has a competitive application process
- because of that, it seems to have some excessively stuck-up people
- a building is named after the shiny silvery thing i stab others' eyes with
- the w store should be named the l store because everything is overpriced
- the physical activities complex has many banners indicating our sports prowess
- i should complete learn modules including mathready, coopready, and tuitionready
- the average weekly schedule can be optimised by eating and sleeping during classes
- all tunnels lead to rch, all bridges dc, and mc is the best shitty building i have ever seen in my life
- i didn't go to mathready

**firstie**



Cannot think or write  
M3 1006<sup>1</sup>  
Is so fucking cold

**cutlet**

1. pronounced with an "and"

# PMAMC&OC WEEKEND UPDATE

## SHORT ATTENTION SPAN MATH SEMINARS (SASMS) II

SASMS I was held last Thursday to uproarious applause. It was so good, in fact, that we're doing it again, with a lineup of four new speakers! It'll be on Thursday, July 27<sup>th</sup>, 6:30 PM–9:00 PM. Food will be provided for members.

## END OF TERM (EOT)

It's almost that time again! We'll be holding an end of term social event for members in early August, and I see fire smoke in your future... The good kind, not the bad kind. Members only; visit MC 3033 to become a member. See you there!

**Evan Girardin**  
President, PMAMC&OC

# WHY YOU SHOULD PLAY THE YAWGH (AND MONSTER PROM)

## AN ADVERTISEMENT FOR YOU TO MAKE A GAME FOR ME

More people have probably heard of Monster Prom than the Yawgh, but the Yawgh is actually the game that inspired it! In fact, Monster Prom's unique mechanics are pretty blatantly made to be like the Yawgh, and while they're both great, I want to dissect the mechanics more than the other factors like story, art, etc.

The Yawgh is a couch co-op game, where you play as one of 4 characters living in a cutesy little medieval town. Except, not all is as it seems, and the game reveals that the town can actually be pretty cutthroat. What's more, at the end of every day is some pretty menacing text about the Yawgh—a disaster fast approaching that none of the characters know about. The game is very good at building up tension with this sense of impending doom, pushing you to spend your days building up your character so that they may survive. In the interest of not spoiling too much, I will not say what the Yawgh is, but rather how it affects gameplay.

The core idea is kind of like a choose your own adventure/roleplaying game. There are 8 places that the characters can go through, for a total of 6 rounds. In each place you will have a random encounter associated with that place, and the choices you make for that encounter both affect and are affected by your stats (physique, finesse, mind, charm, magic, and wealth). There are 102 possible encounters, but honestly I did feel like I was getting a lot of repeats after my third playthrough. At the end of the 6 rounds (6 in-game weeks), disaster strikes, and your stats determine whether you, as well as other people around you, survive.

### WHAT THE GAME DOES WELL

It's a unique concept, I'm always looking for more games to play with people in the room and this is a pretty different feel from, say, Jackbox or something.

The art and writing are both excellent, and add perfectly to the atmosphere of the game.

The random encounters make the game very replayable, and the options of where you can go and what kind of life you live means you really feel like you're being a different person every time.

### WHAT THE GAME COULD IMPROVE

So I'll be honest, real reason I want people to play it though is cause I'm hoping someone makes an upgraded version of this kind of game. While Monster Prom definitely already improves on the game, I think this concept can be taken further. Monster Prom, after a bit of googling, has 23 secret endings, 394 events, and 1408 outcomes which is far more than the Yawgh has. Monster Prom also has a change at the end where the gameplay is mixed up and your stats matter for

the ending you get (the Prom event is the equivalent of the Yawgh). I do think the Prom could be a lot more interactive, where choices you make during it matter more, and honestly like the Yawgh after 2–3 playthroughs you start getting repeat events. The main thing I'd actually change though is to have a game like this that encourages more interaction between characters. Both Monster Prom and the Yawgh have events where other characters are involved, but they always feel a little shoehorned and irrelevant.

If anyone knows how to make the perfect version of this kind of game let me know cause I'm dying to play it.

Not a N\*rd

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## CALL FOR MEN IN SYNCHRONIZED SWIMMING

You heard it here first: men are officially allowed to compete in the Olympics for synchronized swimming! This means they'll be allowed to compete in the 2024 Olympic Games in Paris. You might be thinking, why weren't they allowed before? Why now? Who cares? All great questions that this article may or may not answer.

For all of you synchronized swimming technical detail enthusiasts, the official rule changes are that up to 2 men can swim in the team event (teams have 8 people) per team. There is no requirement for teams to have men on them.

Why this might be bad: this could create difficulties with judging teams with men and teams without men directly against each other. I'm not sure that it makes sense to have co-ed teams, but I also understand that there aren't enough men currently involved in the sport to have full teams of men.

Why this is awesome: there is a social stigma around men being in synchronized swimming (or the official name, artistic swimming), so hopefully this change makes it more acceptable for men to participate in the sport. It will also mean new developments in synchronized swimming skills, and the boundary of what movements are possible could be expanded with the added strength of men. Synchronized swimming is an ever-changing sport, and it's exciting to think about what this change will bring.

TLDR if you're a man interested in pursuing Olympic-level synchronized swimming, the option is now open to you! Yay!

peacelovemath

# RANKING MATHSOC DREAMS: PART 3

**Update:** The board in the executive office still reads 27. This is good news.

## MYSTERY MATHSOC SNACKS

I was in the MathSoc Office with some of the office staff, and there was a random shipment on the ground. Unlike the last dream, it wasn't asbestos! Yay!

Instead, it was office snacks.

For those of you that aren't aware, there are snacks in the MathSoc Office that are free for Math students to take. The VP Operations and Office Staff purchase these. They normally do not show up in random cardboard boxes that are mailed to the MathSoc Office, but the one in my dream did.

So we did what any reasonable person in the dream-world would do. We cut open the box, through the layers of tape, to find it full of snacks. The other problem was that we then had to find a place to stash them, and apparently we couldn't find a place even after scouring the entire office.

6/10—Not the most entertaining dream ever, but it is pretty chill. The next day the VPA tells me that he was indeed expecting something to ship to the office, so perhaps I had a brief moment of precognition?

## MATH GRAD X ORIENTATION

The title is basically the dream. It was the middle of summer, and the Math Grad Ball and Math Orientation were happening at the same time. Orientation is September. Math Grad happens in March-April. Neither of those happen to occur in summertime. And they definitely do not occur concurrently.

First up, Orientation. Instead of happening on campus, it was in the middle of the woods somewhere, like a camp. There were cabins set up amongst the grasses and gravel trails. Benches were lined up on the side of a field. Lower and upper years alike had their lunch boxes out, sitting on the benches as a soccer game carried on. I think the rest of Orientation went on as scheduled, just that it was in a warm summer camp setting instead.

Then the day was over. Everyone went home. Into a winding subway system. You had to go into an underground tunnel, which lead into several twisting hallways inside a mall. Take another escalator down, past glaringly bright lights and displays. And finally, the subway tunnel.

Except it's never that simple. From the first subway tunnel, you had to take another staircase down into the second one. The tunnels were elaborately tiled, yet the floors were as grimy as you'd expect of an average subway station.

One of the Orientation leaders was standing near the edge of the platform, waiting for the next train. I don't remember

who—but I do remember that I tapped their shoulder and shouted over the commotion. *I'm looking for some volunteers for Grad Ball to help sit on the buses going to the venue, so that each bus has a point of contact. Would you be willing to help out? Grad Ball will be in a week or so.*

They said yes, at least. I was trying to find volunteers to sit on the buses for Grad Ball around the time of the dream, but alas, I woke up and had to keep looking for more volunteers.

7/10—Not bad! The subway tunnel sequence, while being confusing to navigate, was pretty neat. The camp environment of dream-Orientation was relaxing. I just don't want to do Math Grad Chair duties in my sleep...

## EXECUTIVE APPOINTMENT COMMITTEE

The Executive Appointment Committee is in charge of interviewing the candidates who are applying to be next term's MathSoc VP {Internal, Operations, Finance, Communications}. I was chair of this committee in F22, and as such, sat in on every single interview. That's the okay part.

What is not okay is the fact that I fell asleep, dreamed about interviewing candidates, woke up, and had to interview candidates. My brain can't conjure up faces it hasn't seen before, so in the stead of candidates I hadn't met yet, I was interviewing the next term's President and VP Academic, who I did know.

4/10—This was stressful. I do not want to be interviewing people in my dreams!!

labyrinth

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## SOMETIMES, I JUST CAN'T WRITE AN ARTICLE

Sometimes, I just can't write an article. I can't bring myself to start typing or even start thinking about what to write.

Sometimes, I'm just busy, ok? No, I do not wish to be busy at all, thank you for asking.

Sometimes, I do have ideas about what to write. But I'm too scared I won't be able to articulate my thoughts correctly, scared that I won't do justice to how I feel, scared about crystallizing my thoughts into words, scared that I'll figure out my true feelings, scared that I won't like them, scared that I won't like *myself*, and scared that I won't do anything to change that.

Sometimes, I just forget. Sorry! [*Editor's note: it's ok lol*]

terminal

## HOW TO DEAL WITH A LOUD ROOMMATE

Do you have a loud and inconsiderate roommate? He shares a wall with you, he screams playing League of Legends until 3am everyday, and he never goes to classes or leaves his room. Unfortunately, with how expensive housing is these days, you'll often find yourself sharing a unit with 3–5 random students. All it takes is one bad apple to ruin your mental health. I'll tell you some tips/tricks to make your life less miserable living with loud roommates.

**Tip number 1:** Talk about the problem with your roommates and set up guidelines.

If they're being loud and causing issues, talk to them as soon as possible. Don't wait a few weeks or months; do it *now*. Don't be afraid to approach and talk to people and make it known that there is a problem. Sit down with them and set a reasonable rule, like, "After 11pm, please be silent as I need to sleep. Thanks." Most people are nice enough and will make changes. If they don't, make sure to remind them a few more times about the house rules.

Unfortunately, some roommates simply don't care, and that's the unfortunate truth. No matter how much you complain, shout, or beg, they won't care. This is when you move to tip number 2.

**Tip number 2:** Buy earplugs and an appropriate alarm clock.

I think earplugs are the best investment you can make as a student. Some roommates don't care that it's final exams period; they'll still be screaming, playing League of Legends

at 3am. Some of my roommates became even louder out of spite after I asked them to be quieter. Bottom line is, there is nothing you can do to change these peoples' behavior. You must find a solution that only involves you: earplugs.

I've tried many earplugs, but I found Mack's sleeping earplugs to be soft and effective at blocking noise. I sleep with them and don't have any discomfort. Someone may ask, "What if I can't hear my alarm with earplugs?" Don't worry. If you have a smart watch, there will be a vibrating alarm feature on it. Use it to wake up. If you don't have a smart watch, you can buy a loud alarm clock. I recommend a physical bell alarm clock (twin bell) or a really loud digital clock. I personally use the Sonic Alert alarm clock with a bed shaker. The alarm is really loud and the bed shaker shakes violently under a pillow. It will wake up most people.

**Tip number 3:** Don't call bylaw enforcement officers or your landlord unless it's a full-blown party late at night.

I called Waterloo noise bylaw enforcement officers multiple times when I was living with Laurier party people. They don't do anything unless it's really loud partying affecting neighbors. Your landlord? Don't bother calling them unless you know them well and have a good relationship with them. If it's a corporate landlord like Domus or Accommod8U, don't ever call them; you'll just waste your time.

*A UW student with 5 years of bad roommate experience*

## HELLO FROM THE OTHER SIDE

Hi from China,

I am speaking to you as a cybercriminal now. My crimes are numerous: accessing Discord, accessing Instagram, accessing Google Meets, and more. However, I am pleased to inform that I have yet to play Runescape, as technology only works so far and somehow it no likey me, so RIP my xp gains i guess.

I hope that none of you speaking are secretly spies—I for one am already one (#laurier4ever, I mean, what?). I hope we can reach an... understanding, if you are. I must maintain my employment, with 12am meetings and 6:30am check-ins and the like. Do understand that my employers really don't have Wechat (nor does it make a good communication platform).

I endeavour to return to the lands of the free soon, but what is so wrong with these lands I reside in right now? I lament that I must resort to crime for my business, and lament that I am unable to pull myself from my world to truly live in another's.

Speaking of, y'all should really come here one day, its wild—half of the cars are electric (not kidding! thanks open

source Tesla??), your phone pays for everything (if you hook it up to your card), and there's Chinese Costco. CHINESE COSTCO!!! They have free samples but also one of the sampling booths is literally a hot plate barbecue table and it is wild. There's also CHINESE TIM HORTONS???

Do update me on whatever shenanigans I miss out on, so that I may quickly update myself upon my return. (except the stabbing—even so far away, I cannot begin to process it)

P.S. ExpressVPN no worky no utilize it

Best regards,

*a. the cybercriminal*



# NIAGARA FALLS SPEEDRUN

Here's a fun thing you can do:

- Have an absolutely overwhelming and exhausting week and go to bed on Friday feeling like you absolutely need a day off tomorrow.
- Wake up on Saturday.
- Buy a \$10 weekend day pass and hop on the first 25C bus that you're awake enough for.
- Get off at Square One and take the 21C down to Port Credit
- Chill in Port Credit for a little while. Get a burger and a caffeinated drink of choice and look at the lake for a bit.
- Walk back up to the Port Credit train station and hop on the 1:25 train to Niagara Falls.
- Enjoy the 2-hour train ride, which is the perfect length of time for a train ride imo. Look out the window and admire the architecture of the different train stations. Decide to start listening to audiobooks for the first time or something. Idk.
- Get off at the Niagara Falls train station a little before the scheduled arrival at 3:21pm.
- Be unsure of what to do for a few seconds, then finally give in to the automated voice telling you to get on the free shuttle to the falls.
- While on the shuttle, realize there isn't a free shuttle *back* to the train station and you'd have to buy an \$18 day pass to ride any more buses (unless they're the non-tourist buses with terrible frequencies).
- Your train back to civilization leaves at 4:05. You will have to run.
- Get off the bus at Table Rock Centre, which is the only place you can get off. It's a little too close to the falls for a good photo, so you'll have to walk back the way you came for a bit to get a photo. Try not to bump into all the tourists.
- Wave to the Americans!
- Once you get past the good view of the falls, there is absolutely nobody walking along the road next to the Niagara River. This means you can start sprinting back to the train station. You'll have to book it. Google Maps says this walk should take 49 minutes; your goal should be 25 to 30.
- It's starting to rain now. This is fine. It'll cool you off while you're running. Don't worry about the laptop in your bag that you took for some reason. You'll be at the train soon anyway.
- There aren't many shortcuts you can take, but you can save a bit of time by turning left on Zimmerman Ave and cutting diagonally across a park.
- Run across the parking lot and step onto the train 30 seconds before the doors close, feeling lightheaded and dehydrated. You can't get water on the GO train, but once the train gets to Burlington you can hop off and get a drink and get back on the next train in 30 minutes.

- Do a victory lap by riding to Oshawa and back. There's nothing in Oshawa but you can see the lake along the way (this is what I was going to do but I ran into someone I know in Burlington so I didn't do this).
- Be back in Waterloo before 11pm and spend the rest of the weekend getting all your work done.

I'm pretty sure I have invented the optimal way to take a vacation that maximizes the amount of stress relief while minimizing cost and time. Highly recommended.

\_\_init\_\_

## I LOVE LIBRARIES <3

i love libraries <3

use them. if you enjoy consuming content of literally any kind, libraries are a great place to acquire that content without spending loads of money or accumulating items you might not even get to or hate when you do get to them.

libraries also aren't just for content. the Waterloo Public Library has access to tons of databases including Ancestry.com, it lets you take out a plethora of free items such as vinyl records, and is just a great place to just sit and do work. in fact, the Waterloo Public Library has by far the nicest and most knowledgeable librarians i've ever interacted with—they seem genuinely happy being there and quite capable of helping you with any of your queries!

there aren't many places in this hellscape of a world where you can exist for free and even get access to multiple great resources while doing so. libraries are one of the best places to exist in and not using your local library means that you're greatly missing out on all wonderful things they have to offer.

ps: libraries are losing funding and it would be a genuine shame if this resource ceased to exist or were no longer able to provide all that it provides just because people did not know how wonderful they were

be'f un-wellington

## A HAIKU ABOUT A COWORKER OF MINE

Pays for gas with cash  
For fear of being surveilled  
Uses Instagram

## GO CLIMB A TREE!!

The house I grew up in was blessed with a veritable bouquet of trees; my mom, with her eternally excellent taste, never cut them down. I don't remember the species anymore, but I know we had an evergreen (maybe a spruce?) and a deciduous tree in the front yard. In the corner of our yard, the spruce towered over everything nearby, especially our modest (raised) bungalow. That was one of the first trees I ever climbed.

As anyone who has climbed an evergreen knows, the branches imitate a ladder: perfect baby steps into the world of tree climbing. The needles were soft and forgiving, leaving no cuts or scrapes, so the only sign that I had climbed the trees was the *impossible* to wash off sap that coated the branches, and by extension, my hands. I was physically capable of climbing the tree essentially as high as it went, since it was no more difficult than a slightly sticky and scratchy ladder, but what kept me close to the ground was fear. Being high up is scary! There wasn't really a risk of me falling, since even if I did, I would just land on more branches on the way down, which would be painful, but also cushion my fall; still, I was scared. Sometimes, things are just scary, and that's ok!

Honestly, I kept trying because my brother had figured out a way to climb onto the roof of our house, and I always wanted to know if there was something special up there, so I set a goal for myself: climb high enough in the tree that I could examine the roof of the house, and figure out if my brother kept cool secrets up high. This was not a particularly good reason, but a 6 year old doesn't need a particularly good reason to climb a very tall tree! I did it eventually, and regularly went up there, but the novelty quickly wore off. Eventually, the height became a little less scary, the roof became less unfamiliar, and the climb, freed from novelty and thrill, became mundane. Luckily, there were more trees for me to climb!

A candidate I quickly ruled out was the cedar beside our house that had no branches for at least 10 feet. I toyed with the idea of getting up to the roof of our house and jumping over, but I was told that trying to jump may present issues to the continued wholeness of my leg bones, so that brilliant plan unfortunately remains unused. The backyard, however, had a treasure trove! A maple, an oak, and a pear tree (which was terrible for climbing but excellent for pears). I always thought of the maple as my brother's, and the oak as my sister's.

My sister's tree was damn near impossible to make any progress on. The first branch was probably only about 5 or 6 feet up, but as a small child, it was hopelessly out of reach. The branch was also really thick, and so the only way to climb the tree was to sort of wrap yourself around it, shimmy around until you were on top of it, then stand up. Once you managed that, everything past there was completely trivial. After she first showed me how to climb it, I tried every few days, but eventually I gave up; the tree felt like it had an insurmountable wall, and all that was behind the wall was boredom. Being high in a tree wasn't inherently as interesting as the challenge of getting there, and I was only interested in manageable challenges. And so, I spent my childhood in my brother's tree.

My brother's tree was possible to climb, even when I was a wee lad — there were branches low off the ground, and even though it took some cleverness, there were little cracks I could wedge my tiny hands into. I spent much of my childhood in that tree, taking advantage of my still-resilient joints and jumping out from high. Above all else, I loved figuring out how to get higher and higher, following different branching... branches. I would get high, or close enough to touch the branches of another tree. When I was about 10, a crucial branch broke (I'm unbelievably lucky I was still young enough to be effectively invincible), and there was so much joy in figuring out a new way up. My brother's tree felt achievable, and endlessly compelling.

Climbing so much changed how I saw the world. Anything that went up presented an opportunity for ascension, and I seized those opportunities. But, as I grew up, I forced myself to outgrow this. I stopped climbing random things, and eventually, I stopped seeing a way up wherever I looked. I missed it, and even worse, I didn't realize it was gone! The world was just a little less bright, a little less interesting, and a little less fun. I didn't realize how much I missed it. Until, a year ago, I climbed a tree! It was a fantastic tree for climbing because it was a *terrible* tree for climbing. There were no branches for at least 10 feet, possibly more, and to get into it, you had to run to the tree, jump against it, then push off the tree to *just barely* wrap your arms around the lowest branch. But I did it! I got up into the tree! And when that happened, it was like a switch flipped; at the time, I was really looking for sources of joy, and I embraced this one. Childhood was hard, but getting to be a kid is magical, a beautiful whimsy we don't get enough of; and so, now, I let myself climb trees, and wear silly socks with smiling dogs, and pet puppies in public. After a lot of healing, when I see a tree, I'm lucky enough to see a way up.

Golden

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## SOMETIMES THERE ARE TWO LID

And then you say Lid Lid

normalparameters

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## NINETY MINUTES

Hagey Hall forum:  
Vivek Goel cannot say,  
"Homophobia."

molasses



## THE N STAGES OF YOUR BIENNIAL CIV VI GAME

1. Remember that you bought Civ VI for free on the Epic Games Store one time
2. Spend 3 weeks combing through Discord groups to put together a group just large enough to play, that somehow morphs into a group too large to play
3. Spend one hour waiting for *someone* in the group to download the game because they didn't beforehand
4. Re-download the game because that *person* is you (you forgot your Epic Games password and need to buy it for 90% off on the Steam store).
5. Spend 30 minutes deciding the rules. *Fractal or Continental? Map Size? Barbarians and Clans? Teams?*
6. Spend 30 trying to get everyone to join because someone's laptop doesn't support cross-play (not you this time).
7. Finally starting the game
8. Play for 3 hours, plan your glorious invasion of Scotland
9. The games gets to big and freezes
10. Spend 1.5 hours going back to old saves and relaunching again only to have it freeze after a few additional turns each time
11. Give up and call it a night
12. Wait 6 months and repeat.

Lars Nootbaar

## CS 241 RANT

I have no clue whatsoever why people deem CS 241 one of the easiest courses when the jump from CS 246 is insane. Give me a break—I have no idea why compilers are even deemed necessary, and not even a specialized course where you can delve into more if you're just interested. As someone who's just not interested in compilers whatsoever, I don't deem it to be necessary in my life. I can live with CS 246, CS 240 and even CS 251. CS 241, though, I have no idea what they're on about. They get you to write a really large codebase and you basically die debugging every function that's not working, one by one. Class, assignments are tests are kind of disjoint—doing well on a test doesn't help you with passing the course (I got 80+ and 90+ on both tests and still basically die on the assignments: 0, 0, 30, and 40 being my last 4 assignment scores). Assignments are basically structured so that if you fail assignment  $X$  problem  $Y$ , any assignment  $M$  problem  $N$  with  $M \geq X, N \geq Y$  is not doable; you need to solve it to move on to the next problem. Solving assignment problems doesn't help you with succeeding on tests since the material is presented in a completely different way.

In short, f 241, f my grades because of this shit.

toxicsbridge

## N THINGS I CALLED "SEXY" TODAY THAT I SHOULD NOT HAVE (BASED ON OTHERS' REACTIONS. I STAND BY IT)

- The BLT I made for breakfast.
- My nvim config [*Editor's note: Mine is better than yours*]
- My tmux config
- My general workflow config where I barely use the mouse (I could go into detail but that's not what this article is about)
- Daddy Reynolds
- The light rain, super wind, tornado-warning weather
- A road that curved
- Pasta
- The weather again, post-rain light breeze

0.423

## SCANDALOUS FORBIDDEN ROMANCE!

*PINKIE SPOTTED ON A DATE WITH PORCELLINO*

Get a load of this scoop!

Pinkie has mostly kept their love life hidden from the public eye recently. This has been due to their past relationships ending in some MESSY DRAMA and public meltdowns?! (I'm talking about their fling with the GoldenHawk; that was salacious!)

However, it seems that Pinkie is back on the market again, because last night, we had eyewitness reports that they were petting Porcellino outside of Modern Languages!

Pinkie commented, "It's customary to greet him; I had a meeting that night!"

One of our very own HamHiltaunians stated, "I saw it, and those hands lingered wayyyy too long!"

Porcellino declined to comment.

Pi-Res Hiltoun

Want the tea about the meeting Pinkie was going to? Subscribe to [mathnews.uwaterloo.ca](http://mathnews.uwaterloo.ca) and hear all the hot goss as-it-happens!

# RECOMMENDING AN ALBUM TO EVERY FACULTY

## ENVIRONMENT

I love wandering around your corner of the campus. The vibes are immaculate. You should listen to *Dead Cities, Red Seas and Lost Ghosts* by M83. Everyone should listen to *Dead Cities, Red Seas and Lost Ghosts*, but especially you, because the album very much feels like the environment. “Run Into Flowers” will almost definitely be stuck in your head the next time you’re on a field study.

## HEALTH

I never wander around your corner of the campus. It’s weird and disconnected from everything. You know that building between M3 and some of the health buildings called the Energy Research Centre? What do they do in there? The door is always locked. It’s dark and mysterious and makes me want to listen to *Tomorrow’s Harvest* by Boards of Canada.

## ENGINEERING

You guys all think you’re in the hardest program, and as a fellow engineer, you’re probably right. I tried to have a bit of fun earlier this term, and then almost failed all my midterms. Instead of having fun, you should put on some headphones and listen to *mbv* by My Bloody Valentine to drown out the sound of your roommate playing video games while you’re trying to get the third lab report of the week done.

## SCIENCE

My romanticized idea of a university student before I started university was an image of a young cartoon character calmly reading over neatly-organized organic chemistry notes in the corner of a coffee shop. Of course, I didn’t end up going into any field related to organic chemistry, but the idea still pops into my head from time to time whenever I’m studying on that upper level of STC with the confusing architecture. I’ll leave you with my current favourite study album, *Cosmogramma* by Flying Lotus, which coincidentally has a strong space theme going on. Listen to it while calculating comet trajectories or something.

## ARTS

You guys study psychology right? Maybe listen to *PC Music, Volume 1* by Various Artists and let me know what the hell is going on inside my head.

## MATH

I love you guys. I can’t think of one album that would capture the energy of this entire faculty. Maybe I’ll take the easy way out and come back here at 2:30 in the morning when nobody is around. The time it takes to walk all the way across William Tutte Way at midnight isn’t quite enough time to listen to all of *Blue Rev* by Alvvays, but it fits the atmosphere perfectly. Try walking slower?

\_\_init\_\_

# TOP N EPIC UW COMMUNITY FORUM MOMENTS

- fReEdOm oF eXpReSsiOn
- The stabbing was bad because it was illegal
- **Student question:** Why does the university allow queerphobic and misogynistic groups to organize on campus? Why does the university allow a church that actively calls for violence against queer people to advertise and recruit on campus? This was happening during pride month too, even before the stabbing.
- **Response:** Uhhhhh, I wasn’t... aware of these incidents, but we do listen to you and there are ways to report these things.
- **Student:** You say you are listening, but clearly you haven’t been if you haven’t been aware of these incidents that were discussed within out community and online and reported through official channels that you claim to be monitoring.
- **Response:** (None)
- **Student question:** My biology professor in first year said non-binary identities are not valid and refused to talk about intersex people. How will professors teaching hate be address
- **Response:** Well, this morning we heard professors express their concerns about disruptive students.
- **Further response to above:** Some classrooms discuss gender vs. biological sex, evolution, and other controversial topics.
- **Student:** You’re not listening to us—
- **Vivek, interrupting:** We areeee!
- **Audience shouts at the end:** Show us you care and speak from the heart. Is this what you would say to your family after a tragedy?
- **Response:** (None, of course.)

They kicked the CBC out of the room during this. They promised to share the recording online, but in case they renege on that, we have recorded the session and posted it at <https://youtu.be/SvcUozaCFqU>. Don’t let them hide the truth; watch the recording and see what they said and how badly they fucked up everything in handling this. Or don’t, tbh, if you value your mental health.

# YIPPIE!!! NEW gridWORD!!!

## gridCOMMENT 152.5

yahoo!!! we have arrived with a new gridWORD!! i love u all, please keep on being so amazing as you complete these wacky crazy gridWORDS xoxoxo

last time i asked you, "me and who?", to which we had the following responses:

- sunnysideup: YOUU (soulja boy tell 'em)
- Mr. Goose: Mrs. Goose and I
- spaghettiinhales: spaghettiinhales
- awmlet: me and you :3 (im dr seussin out here)

Mr. Goose, i commend your constant submissions, and thus reward you with the coveted CnD gift card!! please come by

MC 3030 (mathNEWS office) to pick it up when you can :))) also to awmlet and spahettiinhales, i love u both as always ☹️☹️☹️ you would both get 100% in whatever class i would teach a decade from now (and in gridWORD class).

i ask you this time: "who's got that dog in them?", please send answer, solution and pseudonym to [mathnews@gmail.com](mailto:mathnews@gmail.com) by july 31<sup>st</sup> at 6pm!! this issue is sort of **fruity** 🍌!!!

i will see you all then for our final gridWORD of the semester, i can't wait!!!1!!!1!!!1!!!1!!!1111 :ooooo

Wink wonk

### ACROSS

- Heavy reading
- Sandler
- Wowed
- Blood-related
- Kind of wolf
- Body build
- Catholic sacrament
- Accept
- Exotic sneeze sounding fruit\*
- Those who drive a horse-drawn cart
- Elbow-wrist connection
- Expression of pride?
- Like kids eating broccoli
- Oops teehee
- And his brother cheese
- Add to the pot
- Moving performers?
- Building addition
- White wine aperitif
- Lowered oneself
- DiCaprio, to fans
- Greek H
- Field of vision?
- Keep a stiff lower lip?
- Make a seam
- Ass\*
- Kicks an American football
- Scottish hillside
- Part of BYO
- Comet, e.g.
- They kill doctors or something idk\*
- Geological feature that's taller than its surroundings, but anagrams to SHORT
- Feudal status
- Farm units
- Pin holder
- Border
- Santa's sackful
- Bills
- Education station

- All over again
- Large butte
- Scotiabank \_\_\_\_, for concerts
- Beach ball lookin ass fruit\*
- Arabic for "commander"
- Lairs
- Overwhelmed
- Bank (on)
- They are raisin the bar (ahaaa)\*
- Hindu beverage of immortality
- Decoys, in a way
- Bring together
- This fruit loves to jam out\*
- Like exercises on a mat
- Like 21 down
- Alaskan native
- Coagulates

- Conical dwellings
- Traces of impurity elements that alter its original properties
- What happened after I had the Grimace shake
- Insect stage
- Demolishes completely
- "Wonderwall" fellas
- Talk
- Bananas
- All square
- Bank posting
- Stow, as cargo
- Breakfast choice
- Hunt for
- As opposed to dom

### DOWN

- Towering
- The beginning to an old meme ending in "boomer"
- Catchall abbr.
- Excite
- Little green man
- "i" lid

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
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| 13 |    |    |    |    | 14 |    |    |    |    | 15 |    |    |    |
| 16 |    |    |    | 17 |    |    |    |    |    | 18 |    |    |    |
| 19 |    |    |    |    |    | 20 |    | 21 |    |    |    |    |    |
|    |    |    | 22 |    |    | 23 |    | 24 |    |    |    |    |    |
| 25 | 26 | 27 |    |    |    | 28 | 29 | 30 |    |    | 31 | 32 | 33 |
| 34 |    |    |    |    | 35 |    |    |    |    |    | 36 |    |    |
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| 40 |    |    |    | 41 |    |    |    |    |    | 42 |    |    |    |
| 43 |    |    |    | 44 |    |    |    |    |    | 45 |    |    |    |
|    |    | 46 | 47 |    |    |    | 48 | 49 |    |    |    |    |    |
| 50 | 51 |    |    |    |    | 52 | 53 |    | 54 |    | 55 | 56 | 57 |
| 58 |    |    |    |    |    | 59 |    | 60 |    |    |    |    |    |
| 61 |    |    |    |    |    | 62 |    |    |    |    | 63 |    |    |
| 64 |    |    |    |    |    | 65 |    |    |    |    | 66 |    |    |

mathNEWS

# lookAHEAD

| SUN JUL 23   | MON JUL 24  | TUE JUL 25  | WED JUL 26        | THU JUL 27  | FRI JUL 28   | SAT JUL 29                |
|--------------|---|---|-------------------|---|--|---------------------------|
| Parents' Day | Drop/add period for returning students begins                 | National Chili Dog Day 🌭                                  | Add period begins | PMAMC&OC SASMS II<br>Cycle #4 employer rankings available | Cycle #4 match results available<br>System Administrator Appreciation Day          | National Chicken Wing Day |
| SUN JUL 30   | MON JUL 31  | TUE AUG 1   | WED AUG 2         | THU AUG 3   | FRI AUG 4  | SAT AUG 5                 |
|              | mathNEWS 152.6 production night<br>Make-up day for Canada Day | Last day of classes<br>distractED's grandpa's birthday 🎂🎂 |                   | Drop with WF ends<br>Cycle #5 employer rankings available | mathNEWS 152.6 released<br>Cycle #5 match results available<br>Final exams begin 📚 |                           |

## LAST ISSUE'S gridSOLUTION

|    |   |    |   |    |   |    |   |    |   |    |   |    |   |    |   |    |   |    |   |    |    |    |    |    |    |    |    |    |
|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|----|----|----|----|----|----|----|----|----|
| 1  | C | 2  | O | 3  | D | 4  | A | 5  | E | 6  | R | 7  | S | 8  | T | 9  | E | 10 | K | 11 | E  | 12 | S  |    |    |    |    |    |
| 13 | F | 14 | O | 15 | R | 16 | S | 17 | Y | 18 | T | 19 | H | 20 | I | 21 | A | 22 | S | 23 | A  | 24 | N  | 25 | N  | 26 | E  |    |
| 27 | C | 28 | H | 29 | O | 30 | C | 31 | A | 32 | H | 33 | O | 34 | L | 35 | I | 36 | C | 37 | 18 | T  | 38 | E  | 39 | A  | 40 | R  |
| 19 | S | 20 | P | 21 | I | 22 | C | 23 | E | 24 | O | 25 | P | 26 | U | 27 | S | 28 | E | 29 | T  | 30 | A  |    |    |    |    |    |
| 23 | T | 24 | H | 25 | R | 26 | U | 27 | E | 28 | D | 29 | I | 30 | B | 31 | L | 32 | E |    |    |    |    |    |    |    |    |    |
| 27 | C | 28 | R | 29 | U | 30 | E | 31 | T | 32 | P | 33 | H | 34 | I | 35 | Z | 36 | E | 37 | E  |    |    |    |    |    |    |    |
| 33 | H | 34 | A | 35 | N | 36 | S | 37 | P | 38 | T | 39 | A | 40 | T | 41 | E | 42 | N | 43 | N  | 44 | I  | 45 | S  |    |    |    |
| 38 | O | 39 | L | 40 | D | 41 | F | 42 | O | 43 | O | 44 | T | 45 | P | 46 | A | 47 | D | 48 | G  | 49 | O  | 50 | T  |    |    |    |
| 42 | W | 43 | E | 44 | E | 45 | V | 46 | I | 47 | L | 48 | C | 49 | R | 50 | U | 51 | O | 52 | T  | 53 | T  | 54 | O  |    |    |    |
| 46 | C | 47 | O | 48 | X | 49 | C | 50 | H | 51 | I | 52 | P | 53 | S | 54 | H | 55 | A | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| 49 | T | 50 | E | 51 | L | 52 | U | 53 | G | 54 | U | 55 | G | 56 | R | 57 | I | 58 | M |    |    |    |    |    |    |    |    |    |
| 53 | P | 54 | S | 55 | I | 56 | P | 57 | A | 58 | R | 59 | R | 60 | A | 61 | L | 62 | O | 63 | F  | 64 | T  |    |    |    |    |    |
| 59 | R | 60 | A | 61 | V | 62 | E | 63 | D | 64 | I | 65 | S | 66 | C | 67 | L | 68 | O | 69 | S  | 70 | U  | 71 | R  | 72 | E  |    |
| 64 | O | 65 | R | 66 | E | 67 | S | 68 | S | 69 | O | 70 | V | 71 | I | 72 | E | 73 | T | 74 | I  | 75 | Z  | 76 | E  | 77 | S  |    |
| 66 | P | 67 | S | 68 | S | 69 | T | 70 | S | 71 | P | 72 | A | 73 | S | 74 | S | 75 | E | 76 | E  | 77 | P  |    |    |    |    |    |



You should apply to be an editor. You should apply to be an editor. You should apply to be an editor. You should apply to be an editor. You should apply to be an editor. Please?

A mathNEWS EDITOR WHO SPENT ALL DAY ON LAYOUT BUT ALSO WANTS A NEW FRIEND