



## “WHAT’S YOUR FAVOURITE CURSED FAMILY RECIPE?”

I hope you’re all enjoying the end of the two full weeks of snowstorms we just had! As I write this, it’s five degrees and sunny outside: warm enough for me to have left my jacket at home when I walked to campus, and even the unbuttoned sweater I opted for instead turned out to be too much. I’m pretty sure I could have just walked here in a t-shirt with a mug of warm tea and been fine.

Editing **mathNEWS** is frustrating on a day like this: the **mathNEWS** office has no window that we can leave wide open to feel the warm, fresh air. I stepped out to the C&D for a sandwich, intending to enjoy it on the balcony for the first time this year, only to be met with the ever-present sign on the door: “Balcony closed ‘til Spring.”

Look, I know it’s technically still February. But as soon as the temperature hits five degrees, that’s spring in my book. Don’t you see the puddles of melted snow all the way down the Main Path, or hear the birds singing? It’s spring. Let me sit on the balcony. I don’t have that many weeks left before I graduate and they kick me out of the majestic concrete palace they call MC forever.

Anyway, this issue is filled with articles perfect for when you’re stuck inside yearning for the C&D balcony—including, coincidentally, a Waterloo x Laurier fanfic set on that very balcony. We’ve also got a campus stairs GeoGuessr, an explanation of type theory, and a variety of recipes ranging from basic (chicken breast; tomato soup) to insane (cereal with cold milk and slightly microwaved egg???)

Hopefully everyone’s midterms are going okay. I haven’t had any yet: being in fourth-year engineering means they clear out the entire week after reading week for midterms, then never actually give you any midterms, instead leaving you to stress about three or four projects due at the same time. By the time you’re reading this, I’ll have done my first and only midterm of the term, given to me by a 3XX class I’m in that seemingly hasn’t gotten the memo that I’m in fourth year and don’t have time for this shit. My current plan is to just wing it, since I can’t fit studying for it into my schedule. Wish me luck.

“Wait, but couldn’t you have studied for your midterm instead of writing this **mastHEAD**?” you ask. Well, uh,

*derailed*  
Editor, **mathNEWS**

<b>USMAN!</b>	have you tried naan infused with nutella?
<b>MOLASSES</b>	see left. add to: everything?
<b>__INIT__</b>	This one’s more of a family friend recipe that we stole, but guacamole with lots of cumin and various other Indian spices
<b>SEASONED SLACKER</b>	Fried cicada pupa (I do not like it but admire the protein content)
<b>QUAAAAAAACK</b>	Extra soft silken tofu with maple syrup or molasses poured over it
<b>DOLLAR STORE PERSON</b>	Either pizza crackers or being third cousins with my sister?
<b>DICK SMITHERS</b>	I ate the Necronomicon once
<b>LARS NOOTBAAR</b>	Our special surprise. First, 5 pounds nitrogen fertilizer..
<b>干炸</b>	A jelly made from rendered pig skin collagen, dipped in soy sauce
<b>APHF</b>	My mom makes a mean french toast casserole
<b>NOT A N*RD</b>	Beef fizz (ginger ale, condensed beef broth, ice, lemon juice, and divorced dad energy)
<b>別</b>	Chicken Noodle A La King
<b>NIKE</b>	mandarin oranges in jello
<b>DICK CHUDNEY</b>	Editor, please add some cursed symbol gibberish I’m too lazy
<b>CLASSIFIED</b>	shawarma poutine
<b>REVIVED</b>	grilled cheese: toast, cheddar cheese, dip in blackstrap molasses
<b>DERAILED</b>	leaded solder and lead-free solder mixed together to get the best of both worlds 😊
<b>ABSTRACTED</b>	Lemon Concoction
<b>WATERED</b>	salt + sugar water

## ARTICLE OF THE ISSUE

It couldn’t make the Valentine’s Day issue, but we love it anyway. I’ll never look at the C&D balcony the same way again. Congratulations to Not a N\*rd (in collaboration with peacelovemath, Nike, Lars Nootbaar, and Joe) for this issue’s AOTI winner, *Two Geese Above the Clouds: A Waterloo x Laurier Fanfic*. Send a representative to the **mathNEWS** office at MC 3030 to collect your \$25 Conestoga Mall gift card.

*derailed*  
Editor, **mathNEWS**

# I didn’t know that was how I was born.

RIVER STANLEY, **mathNEWS** EDITOR FOR WINTER 2025  
ALONG WITH SARA NAYAR, ISABELA SOUZA, DAVID TERESI, AND JUSTIN YOUNG

# mathASKS 157.4

## FEATURING PROFESSOR TY GHASWALA

**NINJA: I WAS IN YOUR MATH 235 CLASS A WHILE BACK AND YOU'RE ONE OF MY FAVOURITE PROFS! I'D LOVE TO KNOW, HOW DO YOU CURATE YOUR DAILY MID-LECTURE JOKES?**

Thanks for the flattery! I'll give you the previously agreed-upon cash later.

I walk through life letting the winds take me where they will, listening and waiting for the secret puns and witticisms to reveal themselves. Occasionally, if I am paying careful attention, a new and terrible joke reveals itself. Well, not only the winds. I also get my jokes from YouTube shorts and texts from my dad back in Australia. I actually have seven texted pages of jokes now, and I add to them whenever I think of or hear another lecture-worthy joke. I have several excellent jokes submitted by students. At the beginning of each term, I arrange the jokes in a spreadsheet, carefully planning out the progression of jokes throughout the term. Now that I'm writing this, I realise I should be putting this much effort into my actual lectures...

**ANTSFILE: BEST PURE MATH DAD JOKE?**

What's purple, commutes, and is worshipped by five people?

A finitely venerated abelian grape.

Oh, you said best. Sorry, I misread that as worst. David McKinnon told me that joke. It was at that moment that I knew he had to be one of my supervisors.

**USMAN!: CAN ONE FIND YOU PERFORMING AT THE JAZZ ROOM UPTOWN?**

Sadly, no. Although it is one of my favourite music venues in town. I almost did, though! Strangely enough, in the last couple of years of my PhD, I traded knot theory lessons for jazz guitar lessons from an amazing jazz guitarist, who also happened to be an enthusiastic amateur topologist. The plan was to join him for a song or two during one of his performances at the Jazz Room, but I moved too soon after graduating for that to eventuate.

**\_\_INIT\_\_: WHAT'S THE SECRET TO WRITING GOOD PUZZLES?**

A true magician never reveals his secrets. Since I'm not a magician, and puzzle writing isn't magic, here's what I think. Most importantly, you have to be motivated by the solver's enjoyment, not by showing off your own cleverness (of which you obviously have plenty if you're writing puzzles!). The second most important thing is to get your puzzle tested, and be completely and absolutely willing to change it to make it better. Some of the participants' favourite puzzles from this year's Key Clues were written and rewritten more than five times, to a point where they were barely recognisable as being a product of the original puzzle.

It should be said that many other enigmatologists on the current Key Clues team write far better puzzles than me, so I'm not sure I'm the right person to answer this question! Now I want to hear what they think the secret is.

**NIKE: IS YOUR REFRIGERATOR RUNNING?**

It used to, but it's not anymore. It got busy and moved its own wellbeing and mental health to the bottom of its priority list. Every day it wakes up and promises itself to get more exercise, but it just spends more time than it should mindlessly scrolling through short videos that feed some unidentified addiction, while adding no actual value to my refrigerator's life. It's not a great situation. Also, my food's going off.

**MOLASSES: HOW DO YOU MAKE FRIENDS AS A REAL ADULT?**

This question implies that you think I'm a Real Adult. It also implies I am good at making friends. These are both very flattering, thank you. And misguided. The few friends I have made have been from doing things in real life! Playing squash, volunteering for random things, playing in a band, running trivia, running Key Clues, solving puzzles, the list goes on. Go for the activity, stay for the friends. When you really think about it, that's what makes these things enjoyable, right? Just say yes to doing things!

**NO PUN INDENTED: THE CEMC IS THE ONLY REASON I KNEW ABOUT UW, AND ULTIMATELY THE REASON I CAME HERE. DO YOU THINK CEMC HAVE A LONG, PROSPEROUS FUTURE AHEAD OF IT, AND WHAT IS THE TEAM DOING TO ENSURE IT WILL?**

The question is very relevant at the moment! We are up for a new director this year, and we're all taking a good hard look at what we do and how we do it as a result. The CEMC is filled with talented people who really really care about what we do. I mean, if you're going to sell anything in life, there are fewer things better than mathematics and computer science!

I do think the CEMC has a long and prosperous future ahead, even if I only think this because it means I'll have a job in the future. While it's fantastic to disseminate mathematics and CS propaganda for its own sake, we also play a deliberate role in the Math Faculty's recruitment. Members of the CEMC often accompany UW recruiters on their trips, warming up the crowd with some sweet maths and CS, before a recruiter takes over. Not to mention the inevitable recruitment side effects of our contests, camps, courseware, and all our resources for elementary and high school teachers. It's an indispensable part of the Math Faculty, both spiritually and financially. The Faculty is an indispensable part of UW. So, by transitivity, I'm optimistic about the CEMC's future. It really is a unique thing to have an entire outward-facing unit like the CEMC in a university, and I hope the powers that be in the university recognise what a gem it is!

### DOLLAR STORE PERSON: WHAT'S YOUR MOST USED DAD JOKE?

It must surely be this one:

Did you hear about the kidnapping down at Waterloo Collegiate? It's okay, the teacher woke him up.

I told that joke in one of my first lectures in a Fall 2022 edition of MATH 135. I lay down the setup, and before saying the punchline got interrupted by a girl who exclaimed, without missing a beat, "how could anything funny possibly follow that!?" The interruption was far funnier than the punchline that followed.

### \_\_INIT\_\_: FAVOURITE NUMBER?

Morphine.

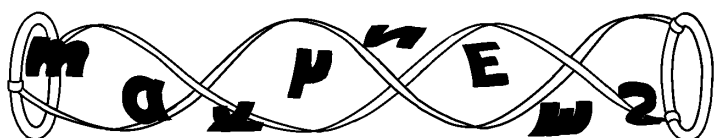
### CLASSIFIED: WHAT WAS THE MOST SATISFYING PUZZLE THAT YOU SOLVED?

It would have to be a puzzle from the 2010 Sydney University Mathematics and Statistics society puzzle hunt. The puzzle was called In Shufflin' Feet, written by Robert Tang. It took my team somewhere around 50 hours to solve, with several hints, but that was a puzzle to behold! You were given around 50 cards, each with a stick figure person in a different pose. If you figured out how to flip through the cards in the right order, the figures danced well-known dances. After each dance you had to perform an inshuffle (a specific type of shuffle one does to a deck of cards). After you did this several times you received a message telling you to unshuffle the names of the dances. Once you did this, you extracted some letters to get the answer HACKY. Ah, I remember it well.

Weirdly enough, in 2013 I attended my first research conference in Austin and heard an Australian accent behind me. I turned around and introduced myself (yelling things like CRIKEY, and BARBIE, and KANGAROO in the process to identify myself unambiguously as a fellow countryman). The person said "hey, you hunt with Wild Goldfish!" (which was my puzzle hunting team's name at the time). I looked down at his nametag which, sure enough, read "Robert Tang." I told him how much I loved that puzzle. It was awesome (both the ridiculously unlikely exchange and the puzzle).

### LEAH: WHAT GIVES YOUR LIFE PURPOSE?

I have four hilarious children from a 10-year marriage. So, I'd say solving well written puzzles and watching the Australian cricket team play five-day test matches that sometimes end in draws gives my life purpose.



## LAURIER MUSICAL THEATRE REVIEW

### AN ARTICLE DELAYED BY DISEASE

Almost exactly one month ago, at the time of writing, I went to see the The Addams Family production by Laurier Musical Theatre. It managed to fall perfectly between two bouts of illness, one of which caused me to miss talking about it last issue and also to miss the FASS musical. I wish I saw FASS, but I must say Laurier Musical Theatre was quite satisfying itself.

If I'm being honest, I went in with very low expectations. Despite the fact that musical theatre seems like it would be my jam, I haven't seen many musicals. I did like the ones I have seen, but my experience has been with either fully professional productions or FASS with nothing in between. So essentially I was expecting something only slightly better quality than FASS.

### BOY WAS I WRONG!!!!

Laurier Musical Theatre is actually so good and I can't wait to go see them again next year. The music was so good I thought it was a recording that they were playing on the speakers. The props were immersive (admittedly, I can suspend my disbelief very easily). The acting was expressive and engaging. The singing was moving and powerful. And the dancing was on point.

Props to all of the cast, the production, the band, and the crew. I was absolutely blown away, and I would've been even with higher expectations. Amazing stuff.

Also on a more meta note, it was so refreshing to see well written lyrics. This thanks goes out to the lyricist, who is a Broadway professional, but after years of recent Disney movies with lyrics of varying quality it was an absolute breath of fresh air to hear.

Now, was the production perfect? I would say no with an asterisk. Notably there were a handful of male roles that were played by women, which mostly worked but required a bit more suspension of disbelief, even for me. But I wouldn't be surprised if not enough men auditioned for there to be enough good ones for all the roles. It's not the fault of Laurier Musical Theatre that there's an imbalance, they're just doing the best with what they have. There are other things I could nitpick like the tango being mirrored, but frankly it doesn't matter and I don't want to nitpick like that. The fact that I'm struggling to find things I dislike should be an indication of how great a job they did.

If you made it this far in the review you should come to 24 hour SASMS starting Friday, March 7<sup>th</sup> at 4pm in MC 1085 lecture hall to see my talk on deriving the area of a parabola arc without any algebra!

# TONAL LANGUAGES: A MORE EFFICIENT COMMUNICATION SYSTEM FOR NUMBERS

## ABSTRACT

In theory, some languages are more efficient than others at conveying information (Coupé et al, 2019). We propose a minor edit to the English language in order to improve its information density per word spoken through the use of tonal inflections.

## INTRODUCTION

Numbers have too many syllables. For example, when we say 58491, we have to say fifty-eight-thousand-four-hundred-ninety-one, that’s more than 2 syllables per digit! Wouldn’t it be nice if we could omit extraneous syllables?

In fact we can! Instead of writing hundreds, tens, or thousands, we could use tones. For example, the number otherwise known as twenty can be re-expressed as simply *tʷò*. The number “ten thousand six hundred and twenty three” can be re-expressed as “*òne sĭx tʷò three*,” a savings of six syllables or over six percent! This would over double the communication efficiency of English when it comes to expressing natural numbers up to 10000.

## METHODOLOGY

Take three programmers and put into small room for many hours. Ensure that at least one of them has just had a breakup. Make creamy tomato soup as follows:

1. Chop up ònetwo tomatoes, one stick of celery, and one large onion roughly.
2. Pour into large stock pot along with chicken broth and seasoning for thrèe minutes.
3. Pour chunky soup into blender. Blend until smooth.
4. Mix butter and flour into now empty stock pot in order to make roux.
5. Pour smooth soup back into the pot. Add cream.
6. Serve as desired.

## RESULTS

10,000	1,000	100	10	1
òne	óne	õne	òne	one (similarly for two and four)
thrèe	thrée	thrèe	thrèe	three (similarly for seven)
fĭve	fĭve	fĭve	fĭve	five (similarly for six, eight, and nine)

TABLE 1. Proposed Tonal Representation

## DISCUSSION

The efficiency gains are obvious, as outlined in this paper. We expect tonal based number systems to achieve international adoption by as early as *tʷòtʷòfĭve*.

For decimal numbers, further research could be done on incorporating scientific notation into the tonal system. One million would simply be “*one E six*.” Alternatively, English could also adopt IEEE 754. Further research is needed.

Dai Bowen, Lai Valery, Lungoci Elena

## Bibliography

1. Coupé, C., Oh, Y. M., Dediu, D., & Pellegrino, F. (2019). Different languages, similar encoding efficiency: Comparable information rates across the human communicative niche. *Science Advances*, 5(9), eaaw2594.

# MATH GRAD BALL TICKETS (PLEASE I’M BEGGING)

Hello, fellow wonderful Waterloo math students. I come to you today with a pleading request—**a ticket to the math grad ball**. If anyone has a ticket and is no longer able to go, I would **really really** like to buy it off of you, please. I am graduating this semester, and it would mean a lot to me to be able to go. I unfortunately didn’t realize they would sell out so quickly, which is my bad, but if anyone is able to help me out, that would be awesome :)

If anyone is able, please reach out to me via this Google form:



# OPTIMAL WALKING ROUTE TO FARM BOY

Why Farm Boy? Because they have really good sourdough bread. Better than anything else you'll find anywhere near campus. Trust me: once you try it, you won't be able to quit.

Now that you have the motivation, here's the route. Note that this route is not optimized for distance or time: if those mattered to you, you'd just take the 201. In fact, this route is almost twice the distance of just walking down Columbia and turning left on King. This route is for those who want to put on a nice little podcast or album, or just listen to their thoughts and the ambience of the outside world, and enjoy the journey.

1. Walk north on Laurel Trail. If you're coming from Phillip Street, consider cutting diagonally through the East Campus parking lot towards Columbia instead. It's a wonderfully quiet, liminal space where if you listen very closely, you can hear the voices of BlackBerry engineers of decades past. Legend has it that one of these very parking spaces was where one clever engineer came up with the idea to have a touchscreen also be a physical button that you can click.
2. Once you reach Research and Technology Station, wave hello to Karl Gay,<sup>1</sup> then walk to the other end of the ION platform where you'll find an exit leading to a multi-use path. You have a choice here: either follow the path to Phillip Street, where you'll see a warehouse-looking building which sometimes inexplicably flies a Texas flag; or, you can shave off an extra few minutes by cutting diagonally through the parking lot, taking special care to not disturb the sleeping school buses that sometimes occupy it. If you went to Phillip Street, you'll want to turn left and follow it east to Albert, then turn left again and take that north towards Hazel. Yes, these roads do all intersect, even though you're used to them being parallel, because Waterloo roads are just like that.
3. Cross the Albert/Hazel intersection diagonally [*Editor's note: within the crosswalks, of course. Don't die.*], then cross the parking lot you are now at, also diagonally, to behind the Pizza Pizza, behind the Homestyle Diner. If you see a bunch of dumpsters on one side and a bunch of people's backyards on the other, you're in the right place. At the end of that driveway is the entrance to a path in the forest. Go there.
4. You are now in the forest. Isn't this better than Columbia Street? If the path ever splits into two branches, choose either one, it doesn't matter. At one point you'll hit a +-shaped intersection; go straight. Or you can just go whichever way you want: every path will lead out of the forest eventually. It's fine. If you followed my directions, eventually you'll exit onto Weber Street.
5. In front of you is... a farm field? In the middle of the city? Like they developed around it and just forgot to delete the field? Really funny. Turn right

here. Farm Boy is just down the street, but you'll need to find a place to cross. If you want you can go all the way to the intersection with King and use the crosswalk there, or you can find the median crossing island somewhere along the way, or just jaywalk. The one that I choose depends on how much snow is on the ground.

\_\_init\_\_

1. See mathNEWS 150.5, page 8.

## WHAT'S YOUR IDEA OF A GOOD READING WEEK?

**BECAUSE FOR ME, IT'S ABSOLUTELY ZERO CHANGE IN MY DAILY ROUTINE, BESIDES A FEW MORE HOURS TO BE LAZY**

Did you go home for reading week? How I envy you. Because I did fuck all but laze around in bed.

Except when I didn't.

When I wasn't being an unproductive loser in bed I was in the computer lab, doing literally everything but my assignments. You ever feel that? Perhaps I need some kind of medication for it. But I'm not here to play doctor, I'm here to lament about the thing every single person my age struggles with, procrastination.

I've been working on interesting projects lately. One of which might go somewhere this summer (if it does, I'll write another article about it and hopefully get some ~~advertisement~~ exposure from it here), but as I'm sure many of you too struggle with, there is an inability to plan and to always frontally assault every single thing that occurs in life. And that's what happens in midterms too.

Do you ever do that in midterms? Maybe you're mature and you don't. Not me. Like a zombie, once the midterm reaches my hands, I descend upon it like a vulture without any prior strategy and scratch out whatever the poor, overworked wagie brain cells conjure up.

But it works. I get a mark that's to the right of the curve.

Except when it doesn't.

And when it doesn't, who do you blame? Who do I blame?

Everyone but myself?

That might just work. Let me know how it goes.

daemon

# MAKING MY COWORKERS GUESS MY PSEUDONYM AND READ MY FANFIC BECAUSE I HAVE NO SHAME

soooooo for context, i've already mentioned to 5 of my coworkers (also university students) earlier that i wrote fanfic in **mathNEWS** (because it's arguably my biggest accomplishment because i am just a pathetic little dollar store person!) anyway, one day, me and my coworkers were talking and eventually got to **mathNEWS**, and i was like "oh, i wrote in the last edition [157.1]" and for a second, they wanted to guess the article i wrote but then we got briefly distracted (as we usually do) but i reminded them and still made them do it. why? you may ask. well guess it was funny and i wanted to do it for the plot. plus we're close so here's some fun thoughts and notes from that time:

- the first guess was a book review which like damn it's good, but they really called me a nerd. and i mean it's true but still i haven't read a book in a month
- the highest compliment given was being labelled as *Not a N\*rd* and their amazing article
- they soon ruled out *Not a N\*rd* because they didn't think I went to a halloween party, which is fair but i would!
- second-highest compliment was them thinking i wrote *Music for Sex* and to be honest, that was the biggest confidence boost i've ever had, especially as a person who feels boring (but boring and **mathNEWS** writer are two words that never mix)
- lowkey hated how they read my article in 157.1 and immediately got it, like I wanna be mysterious and unpredictable but I can't not say "aforementioned," it's such a good word!!!
- at this point, i suggested reading my fanfic as well and looking back, i don't understand how i didn't feel embarrassed like if they read my creative writing, i'd be mortified but probability fanfic? perfectly fine and normal ofc
- i can't believe my coworker read my bridge fanfic on the subway but shoutout to him i guess
- reading out my fanfic at 9:00 in the morning is not what I expected to be doing with my life but here we are (this was the bayes' x reader one, which is definitely worse considering all my mistakes with first person instead of second because yes i imagined myself flirting with a fucking theorem in DC 1350)
- i guess it was well-received? IDK i kinda forgot
- one of my coworkers suggested it wasn't fanfic because it wasn't smutty, which is completely false by definition (not to mention he didn't do great in essentially a fanfic assignment so should I really be trusting his input?) anyway now I'm motivated to write bridge smut to torture him? or maybe I genuinely want it IDK? every once and again I tease bridge smut in jokes and I might as well do it; I've already thought about the plot because i'm just that fucking deranged

in summary, you should probably not do this unless:

- a) you trust your coworkers
- b) you are unashamed of your **mathNEWS** identity, or
- c) you want constructive criticism on your articles

and i sadly relate to all of the above

Dollar Store Person

## THE OPPOSITE OF LOVE ISN'T INDIFFERENCE

### IT'S HATE

*the child who is not embraced by the village will burn it down to feel its warmth*

but the child wouldn't do that if they didn't care.

It's poetic to express that indifference is the inverse of love, as Elie Wiesel did in 1986. But, this misses the interplay of love, hate and indifference. Indifference is the absence of passion in any direction. If I drew a graph, I would make an axis for passion and another for the goodness of intention. I would place indifference at the origin and place hate and love at the extremes of passion and intention, reflected about the axis of passion.

Love and hate combine more interestingly in this space, their sum annihilates intention but doubles passion.

*hatefuck*

Indifference is not so symmetric. In the presence of indifference, love decays into either hatred or more indifference, depending on the nature of its victim. Yet, hate thrives in the soil of indifference. Evil festers unrecognized and unchecked.

*republicans*

So, what is the opposite of love? Absence is not opposite, but hate as we commonly think of it is a fiery reflection of love with poor intentions. If we negated love with respect to both axes we get some kind of malicious neglect: which, at their best, is a

*billionaire*

*dog rope*



# DOES ANYONE WANT TO TALK ABOUT HOW BAD CYANIDE AND HAPPINESS IS

OR HOW I LEARNED TO STOP WORRYING AND LOVE EVERY OTHER FORM OF COMEDY

Cyanide and Happiness comics take one of three forms: 1. fart-joke tier humor, 2. barely-sequitur puns, and, my favorite of them all, 3. the inexplicable, the utter absence of a punchline or anything that could be considered comedy whatsoever. Most of the jokes that are comprehensible to any level are almost entirely reliant on some edgy hook which is not used tastefully at all.

It's easy to grab a collection of comics with a pretty equal balance of all three of these by just hitting the random button. For a great example of 1, see *The Groper*<sup>1</sup> (2022, <https://explosm.net/comics/villain>). The joke is that the hero looks like a sexual predator, and has a name like a sexual predator, so people that are meant to be saved are afraid of him. This would not be considered funny by literally anyone if not for the fact "groper" is an edgy word. Imagine if the hero called himself "the bandit" instead and wore a bank robber's outfit, like the guy attacking him had. Actually, that would probably be funnier than this, because at least it's not desperately trying to be profane for a sliver of perceived comedic value.

*Kris Mailbox* (2012, <https://explosm.net/comics/kris-mailbox>) is an instance of 2. The joke is that beat also means beating someone up. Yep, that's it.

*Kris Used* (2021, <https://explosm.net/comics/kris-used>) is a 3. The joke is... oh right, it's a 3, I can't find one. A scientist

built a robot that was supposed to be capable of love, and then it left him. I guess this is a commentary on how the capability for love also means having the capability of rejecting it, and maybe the author thought it would be funny if it applied to robots, but, it just isn't really. And the 3-lore goes deeper than this, actually! The authors ran 16 "depressing comic weeks," where there are *intentionally* no jokes, and the comic just focuses on some depressing or otherwise unfortunate event. For instance, *Peep Peep Peep* (2024, <https://explosm.net/comics/peep-peep-peep>), where a duck just gets fucking run over by a car and smashed to pieces alongside all but one of its goslings. Seriously, what is the value in making these? It's just stupid.

But almost everyone seems to like these comics. Look, this isn't because I hate dark humor, there's a lot of well-done dark humor that I like. I mean, hell, even *Rick and Morty* does it a lot better. But as my friend would say, this comic is "fractally bad:" it makes the worst possible decisions at every turn. I think we can do a lot better than Cyanide and Happiness for edgy humor. Someone replace it. Please.

epic\_waterman

1. The comics are not actually titled, so I'm making these names up based on the URL or content.

## HETERARCHY IN DESIGN

AND WHY IT'S SO MUCH BETTER THAN HIERARCHY

*Heterarchy*: relationship of elements to each other when they are unranked or can be ranked in various ways.

Nearly all software, when boiled down to its core, shares the common necessity to add, modify and sift through information. As information scales, the way it's structured becomes more and more important, as it can easily become a bottleneck to those who interact with it.

Hierarchy you're likely familiar with; it's everywhere. Commonly implemented as directories, submenus, classes, children and parents, you already interact with it on a daily basis.

As hierarchy scales, it becomes harder and harder deciding where to slot in information, how it should interact with other information, and how to retrieve that information. It becomes a winding tree of complexity.

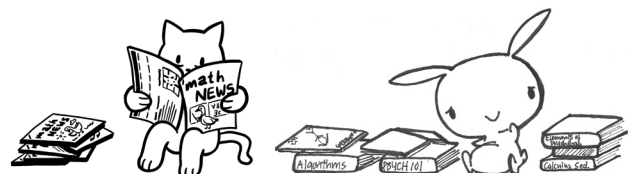
Heterarchy is also everywhere, but its name—for some reason—is not so well-known. Search bars, databases, and

human neural networks are all heterarchical; without rigidly defined structure.

As heterarchy scales, new information simply joins the rest at equal level. Information may have a variety of attributes and interconnect with one other, but there is no rigid structure. It's flat.

My issue isn't with hierarchy itself, it's with hierarchy as a "base" structure. With filtering, sorting and relating, hierarchy can easily emerge from heterarchy as desired. And in my opinion, that's how it should be.

avahhh





# THE DEBT

Phil was taking a break at the office water cooler. He had spent the entire morning staring at spreadsheets, swimming in copays and risk analyses. He was sipping from his small paper cone of water when his coworker walked up to him.

“Hey Phil,” Bob said, leaning over to grab a paper cone for himself. He was new to the floor, a fact his chattiness openly betrayed. “Say, did you know that in the times of the ancient Romans, when statues would decay, they would fill in the cracks with wax? In Latin, ‘sin’ means ‘without’ and ‘cerus’ means ‘wax,’ so ‘sincerus’ means ‘without wax.’ When the statues were pristine and unaltered, they were *sincere*. Neat, right?”

“Look at the time, Bob,” Phil said, feigning checking his watch. “Gotta run. I have a meeting with the boss, a little tête-à-tête.”

He turned to walk away.

Behind him, a window shattered as a projectile flew through it. Heads turned, but employees returned to their typing and faxing soon enough. Phil strolled over to where the object had landed.

He looked down at the projectile. It was some sort of canister with a thin plume of mist sifting out of one end.

“Wait, is this a...”

A thick cloud of gas burst from the smoke grenade, filling the room with a dense noxious fog. Employees started coughing and collapsing as the smoke began to fill their lungs. Screams echoed as several more windows shattered and figures cloaked by the fog swung through, heavy combat boots landing hard against the floor, laser sights slicing through the haze.

Phil scurried for cover, trying to cover his mouth and nose to keep the smoke out. From the far side of the office, he heard Bob shouting at the infiltrators.

“You need to get a guest pass from reception if you want to visit! Please make your way to the elevator and to the first floor, *comprende?*”

A rattle of machine gun fire rang out, and Phil heard the thump of a body hitting the floor. He heard the shuffle of heavy footsteps, the readying of guns, getting closer and closer, from all sides until...

“DON’T FUCKING MOVE, WE HAVE YOU SURROUNDED,” blared a voice.

“Wait what the fuck is going on who the fuck—”

“SILENCE IS IN YOUR BEST INTEREST. WE ARE HERE TO COLLECT.”

“What the fuck do you mean to collect?” Phil stammered, eyes watering from the smoke. “This is fucking bananas.”

“A DEBT OWED MUST BE REPAYED.”

“From the Spanish, *Mande*,” another muted voice said out of the smoke. “He’s shameless.”

“You got that, Jenkins?” chimed another, deeper but also muted.

“Maybe he likes digging a deeper hole,” chuckled yet another. Phil squinted through the haze at its source. The figure seemed to be writing on a pad, shaking its head. “He can’t afford these infractions.”

Phil coughed, trying in vain to keep the thick smoke out of his lungs. “What are you talking about? I don’t owe anything, what’s with this fucking zeitgeist?”

“CEASE FURTHER INFRACTIONS. THE DEBT MUST BE REPAYED, AND THIS IS YOUR FINAL WARNING.”

“Another one. You get that Jenkins?”

“Yep. Powell was right, he’s fucking shameless.”

“What infractions?” Phil stammered. “I don’t owe jack shit. *Sincerely.*”

A loud siren blared. All around Phil, guns’ safeties were switched off.

“IT IS CLEAR THE DEBT WILL NOT BE REPAYED, SO IT SHALL BE RECOUPED THROUGH OTHER MEANS.”

“I guess we warned him,” chided one of the enforcers.

They raised their guns, six laser sights tracking up to Phil’s forehead.

And then it clicked. It all suddenly made complete sense. Phil cursed himself. Foolish—how foolish he had been—every utterance so foolish. He had never even thought about it. For his entire life Phil hadn’t even considered that he might have to repay the debt.

It had never even crossed his mind that someday he would have to pay back the loanwords he had borrowed.

“NOOOOOOOooooooooooooooooooooo,” Phil wailed. “I shouldn’t have relied on those flimsy loanwords.” He collapsed to his knees; his final thought was of his poor financial-etymological planning before the machine gun fire from the enforcers perforated his body into Swiss cheese, filling the air with a fine red mist.

# EWOKS: BATTLE FOR ENDOR: A CHARACTER-BY-CHARACTER REVIEW

## I WATCHED THIS MOVIE SO YOU DON'T HAVE TO

Have you ever seen the Star Wars movie about the Ewoks? The one about the great battle on the forest moon of Endor, with the teddy-bear-like Ewoks and a cast of visiting humans taking up arms against invaders come to set fires to their home. It's awful.

*Return of the Jedi*? Never heard of it. This review is about *Ewoks: Battle for Endor*: a fantasy movie starring orcs, witches, a maybe-racist old white dude, a literal infant, and, of course, Ewoks. In absence of a coherent plot, this article reviews the characters instead.

### WICKET: THEY GAVE HIM A STANDALONE MOVIE

The first character reviewed, Wicket Wystri Warrick is undeniably the most important character of the main cast. Does he have the most lines? Probably not. Is he particularly influential? Barely. Is he represented in *Lego Star Wars: The Complete Saga*? Yes. This alone sets him above all other characters of the movie.

Warwick Davis reprises his role from *Return of the Jedi* and the previous *Ewoks* movie to play him, and is spared from having to voice the character's lines, like "Best friend. Best friend," in reference to Wicket's best friend, a random five-year-old girl. That's probably his most memorable line; they really don't give him much to work with on account of being, you know, an Ewok. In the events of the movie, he and his village get kidnapped by orcs, but not to worry! Wicket escapes, and for the next two hours of the movie the viewer is left to wonder "will Wicket ever go back for his family?"

I'm still wondering.

### CHARAL: A SECRET LABYRINTH CAMEO

Wait, orcs? I thought this was a Star Wars movie?

It is, yet the key villains are somehow orcs led by an evil witch that might be Sauron in disguise. Now, in all fairness, Star Wars' nightsister witches in their modern form are sick as fuck. However, this movie was made in the 80s; their idea of a witch was pulled straight out of *Labyrinth*, complete with spiky shoulder-garments, a fur cloak, not-quite-not-boob-armour, the whole set really. She even transforms into a raven in the most eighties, sparkles-and-mist transition you can dream of.

In any other eighties movie, this would have been, again, sick as fuck. But... in sci-fi? Who greenlit this??

### CINDEL: AN INFANT. AN ACTUAL CHILD.

After the horrible disaster of the first made-for-TV Star Wars movie—the *Star Wars Holiday Special*—it seems Lucasfilm struggled to find a lead actress for their next try. Anyone who

remembered the first made-for-TV movie could never be convinced to join this second effort. Simple solution! Hire someone who cannot remember the movie made five years prior.

That's right. The lead actress of this movie? She's five years old.

I don't know what more to say about this. She has the most "oh no! anyways" reaction to the violent deaths of her entire family in the opening of the movie, but can you blame her? Her actor is five; she's clueless. This means our two lead roles are 1) a five-year-old, and 2) a walking teddy bear. Does this lead to anything worth watching? At all?

There's only one way to find out, but I really don't recommend it.

### JEREMITT: HE DIES IN THE FIRST FIVE MINUTES BUT HE'S REALLY GOOD AT IT

*Ewoks: Battle for Endor* does the funny sequel strategy where, within the first five minutes, you brutally kill off everyone the viewers loved about the first movie. The thing is, they couldn't actually get the full cast of the first movie to come back for the five minutes it takes to kill them.

Instead, they had to bring in Paul Gleason as a replacement. I'm not sure what is more bizarre to see in the movie: the shapeshifting raven-witch, the legion of orcs, the infant, or Recognizable Actor™ Paul Gleason. This man has played actual roles, including but not limited to the vice principal in *The Breakfast Club* and the police chief in *Die Hard*. How did they convince him to do *Ewoks*? I have no idea.

### NOA: LIKE IF SHREK AND QUAKER TOM BOMBADIL HAD A BABY

Speaking of famous actors, this third lead role is portrayed by Wilford Brimley, a man known for many things, one of them being his portrayal of the Quaker Oats quaker throughout their commercials.

He unfortunately does not reprise the role in this movie. Instead, he portrays an old man in a swamp. He almost has Tom Bombadil vibes: old man, hermit, lives mostly alone but with a singular companion. I am realizing this description would also apply to Shrek. This man even dresses like Shrek.

He's like Shrek if Shrek was maybe a racist.

See, the old man doesn't like the aliens he spends the movie with. He *could* call them by their names, but maybe he doesn't believe they should get those? Look, I'm not saying he's definitely racist. But I reiterate: this role is portrayed by the Quaker Oats guy. He is, quite possibly, the most well-suited

actor to play an old racist white guy. Could his character really not be bothered to learn the aliens' names? Does he have to call them easily-badly-misheard nicknames?

Fuck it, I take it back. Watch the movie. Tell me I'm wrong. The character is totally a racist, it's just the eighties, and the entire cast is too white for it to come up.

**TEEK:**

I give up. I'm not reviewing this speedster monkey creature. Just watch *Skeleton Crew* instead. It's like a beautiful crossbreed of *Stranger Things* and *Pirates of the Caribbean*, where four kids contend with robots, space travel, and the Pirates' Code. It's replete with cool aliens too: one of the four kids is a really adorable elephant, and when the kids get to their first spaceport, they meet this really fast monkey creature —

hey wait a second



**A SIDE-BY-SIDE COMPARISON**

it's the fucking speedster monkey from *Battle for Endor*.

who the Fuck revived Teek????

molasses

# NEE DOH

There is a product at the W Store that has come to my attention recently. It is a two-by-two centimetre block of squish under the name Nee Doh. If you look closely at the name, you may find that an anagram of nee doh is *oh, need*. This is because you need it. You can throw it at walls, toss it to your friends, or squash it to your heart's desire. And it will always return to its original shape: a cube. Two dollars fifty cents later and I feel enlightened to the highest extent. If you feel empty after your failed Aphrodite link, or generally like squishing things, get one of these bad boys asap.

nike

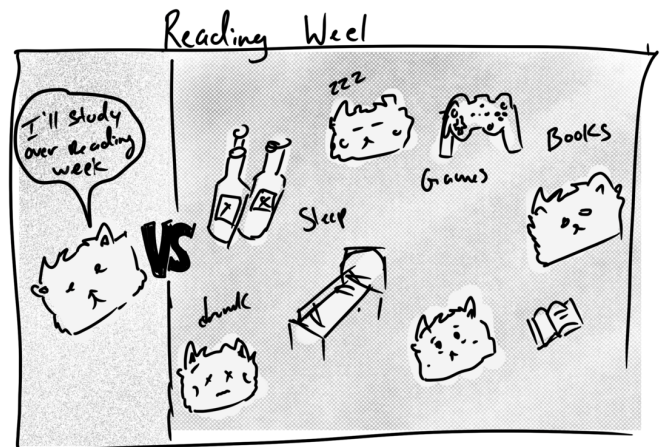
# N THINGS I LIKE TO SAY (NOT CRINGE) PART 2

## N THINGIES I MISSED FROM LAST TIME

- yapping
- crashing out part 3
- bro
- thingy
- bruh
- ripp
- BRUH
- five big booms
- that's crazy
- ok
- huh
- blud
- yummers
- eepy
- I'm hungry
- I don't feel like locking in
- I need to lock in (proceeds to not lock in)
- Why does CnD not have samosas when I want them??
- hmmm (in thought)
- chill
- ...
- \*face palm\*
- write that down! write that down!
- let's goo!
- bet
- oh no
- wait what

insert pen name here

# FUCKED UP LIL FURRY THING



p.s.: do not microwave!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

Ignis\_

# A PRETTY GOOD TOMATO SOUP RECIPE

If you happen to have followed my **mathNEWS** writing over the past few terms, you may have noticed that these “pretty good recipes” are my way of phoning it in when I can’t think of anything novel to pen or haven’t watched enough anime yet to put together a collection of reviews.

(I didn’t think anyone followed my **mathNEWS** writing, but recently a few people have asked me in person if I was *yalevoilian*, which was a bit of a surprise.)

Both of those things are incidentally true, but I also have a legitimate excuse this time around, namely that I’m hosting a midterm review during the prod night this week. So with that, here’s the recipe for some tomato soup that I made a few days ago.

Note that you’ll need a blender of some sort to make this. I use an immersion blender, but a regular one would also work.

## INGREDIENTS

- 2 lb. tomatoes (I used small ones but any kind will do, really)
- ½ red bell pepper
- 1 yellow onion
- ½ bulb of garlic
- Tomato paste
- 2 cups vegetable or chicken broth
- Heavy cream
- Olive oil
- Lemon juice or vinegar
- Salt
- Pepper
- Basil (fresh or dried)
- Red pepper flakes
- Any other herbs or spices you want (I’m partial to some ground ginger)

## DIRECTIONS

1. Cut the tomatoes and pepper into pieces and place on a large baking sheet, along with the garlic with the tip trimmed off (but the rest of the skin on). Drizzle with olive oil and bake at 400° F until softened.
2. Once the tomatoes and other vegetables are almost done, dice the onion and sautee in a pot until soft. Add and slightly cook some tomato paste too.
3. Remove the tomatoes, peppers, and garlic from the oven and add to the pot. (You should be able to easily squeeze the garlic out of its skin if it’s soft enough.) Also add the seasonings, broth, and a splash of lemon juice or vinegar for acidity.
4. Add the broth and simmer for 8–10 minutes.
5. Blend the soup until smooth.
6. Add heavy cream and simmer for another 8–10 minutes.

7. Serve hot, and optionally top with more basil, olive oil, and/or cream for decorative effect. Bonus points if you make grilled cheese too.

*yalevoilian*

## N SONGS I HEARD IN LAS VEGAS

- *Not Like Us*—Kendrick Lamar
- *Turn On The Lights Again*—Fred again.., Future, Swedish House Mafia
- *One More Time*—Daft Punk
- *OMG*—Usher, will.i.am
- *Turn Down For What*—DJ Snake, Lil Jon
- *Get It Sexy*—Sexy Red
- *Taki Taki*—DJ Snake, Selena Gomez, Ozuna, Cardi B
- *FE!N*—Travis Scott, Playboi Carti
- *Let Me Love You*—DJ Snake
- *Lean On*—DJ Snake
- *You Know You Like It*—DJ Snake
- *SG*—DJ Snake
- *U Are My High*—DJ Snake
- *Lunatic*—DJ Snake
- *Bird Machine*—DJ Snake

You get the point.

Sidenote: DJ Snake was really vibing with this one uncle:



I wanna be that guy when I’m 60

# THE INNER TUBE WATER POLO EXPERIENCE

Whenever I tell people I'm playing inner tube water polo as an intramural sport, the first thing they usually ask is, "what is that?" They are familiar with its better known older brother, *water polo*, but most people are not sure what this *tube* thing is all about. Then I'll pull up a photo, or better yet, a video. I encourage you to do the same if you are unfamiliar with the sport. Go ahead, pull up YouTube and type "inner tube water polo." If you ignored my instructions, here is the goal of the game: two teams each have a net on either side of the pool. Each team has six players in the pool at a time, with one of the six being a goalkeeper. There is one ball in play, and the objective is to get the ball in the opposing team's net. Players can only touch the ball if they are firmly seated in their plastic blow-up tube. There are several more rules about the inner workings of the game, but if you're truly interested in understanding the depths of inner tube water polo, you can find the rule book on the Athletics website yourself.

From the outside it can look, perhaps, a bit *goofy*. You can't swim normally because you must always be in a tube, which becomes a bit awkward. I understand this. I was once on the outside looking in. But once you're in it, *you're in it*. It can be a very serious game, and any self-consciousness melts away at the intensity and focus required for the sport. In order to describe my experience, I have divided this article into two sections:

## 1. THE ATHLETICS RULE BOOK VS. THE HUMAN SPIRIT

The Official Intramural Water Polo Rulebook on the Athletics website has many peculiarities that fascinate me. First and foremost, part B, section 8 of *Intramural Innertube Waterpolo Rules*, Revised Winter 2023, states "Substitutes must enter the tub from the player leaving the playing area... they must not jump into the tub." What confuses me is the ambiguity of the use of "tub." On one hand, tub may be referring to the pool itself, as what is a pool if not a large tub? Alternatively, this is a misspelling of the word *tube*. Which is correct? This is an exercise left for the reader to ponder.

Part G, section 6c ii) states "Players may not make contact with another player: this includes but is not limited to holding, riding, hitting, jumping on, pushing off from, or tipping another player." Interestingly, the rulebook does not specify what is considered a *player*. Does the tube count as an extension of the player, where the term *player* refers to both human and tube? I look to Part E: Equipment, where section 3) states "The following equipment will be required: Game Ball and Net, Innertubes." The capitalization here leaves me with more questions than I started with.

This is where the clarification of the word "player" becomes important. Is it illegal to hold the human *as well as* the tube? If so, then I must note that part G, section 6c ii) is by-far the most frequently broken rule of the sport. Pushing and holding of tubes is rampant, whether it is swimming against opponents to influence their movement, grabbing or kicking the opponents tube to stop them, or blatantly pushing a tube

away with hands. I think at this point, I should mention that I am an individual that some may describe as *physically weak*. I don't have much power to ground myself when tube pushing occurs. On top of this, I am frequently up against individuals in this sport with the arm span of a fully grown bald eagle. Therefore, the *tube holding and pushing* strategy is particularly a problem for me. However, this aspect of the game channels the viciousness of traditional water polo, so maybe it is to be expected.

## 2. MAN VS. TUBE

Oftentimes, inner tube water polo feels like a battle between oneself and the tube rather than a battle between two teams. The tube restricts your ability to swim in natural ways, such as *front crawl* or *breaststroke*, and forces you to get around by swimming backwards while kicking your feet and paddling your hands. The purpose of the tube is to make water polo more accessible to the average person, as you do not need to tread water like in traditional water polo. But sometimes, when I am swimming backwards with my butt in a tube, reaching desperately for a ball behind my back while my opponent next to me races to do the same, I wonder: *is this truly the easier way?*

Moreover, the tubes provided are frequently deflated or simply *missing*. In an ideal world, each team has differently coloured tubes to clearly distinguish members of each team. As someone with terrible vision, I appreciate that! However due to the apparent tube shortage, occasionally teams have to share one or two tubes of the same colour. At these times, I just pray my blurry facial recognition does not fail me.

In conclusion, inner tube water polo is a very fun sport. If you have spare time on your weekends, I recommend signing up for the intramural league. I played a lot of team sports in high school but completely stopped once I reached university. Being able to play on a team with some healthy competition has been very fulfilling. Despite all of the peculiarities of this sport, everyone I have met has been super kind and encouraging, and it's a great time!

*closeted atheist*

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## COOL MINECRAFT SEED

I found this seed when I was trying to speedrun the game. There's a woodland mansion at spawn. According to the Minecraft wiki, the chance of this happening is less than one in ten million.

-2375779862232379960

*easty*

# profQUOTES

**ACTSC 232: MIRABELLE HUYNH**

“...and then, you can die whenever you want.

**AMATH 475: EDUARDO MARTIN MARTINEZ**

“You’re used to the abuse.

**CS 365: ERIC BLAIS**

“What would you as a researcher in this case? You would give up and start researching in AI. There is more funding there anyway.

**CS 488: GLADIMIR BARANOSKI**

“Pretend that I’m a god. Not big G, small g.

“Either you get the mark or you get executed in my office.

**CS 488: STEPHEN MANN**

“Between doing work and playing video games, go for the video games.

**CS 492: RICHARD TREFLER**

“Interesting, thank you. *[Repeated  $n \geq 14$  times throughout the lecture, making up approximately 75% of his words spoken in the lecture]*

**ECE 250: PATRICK HUANG**

“*[Starting to teach a deletion algorithm]* Do I have enough time? I have two minutes... good enough.

**ECE 423: RODOLFO PELLIZZONI**

“I will generally not make you draw something that is not finite.

**ECE 459: PATRICK LAM**

“Do you love your GPU? You probably shouldn’t, it doesn’t care about you.

“I don’t think it should be controversial but I think all people have human rights.

**MATH0102 (UCL): GAVIN ESLER**

“So basically, all of financial math is just an easy corollary of what Feynman did in the ’50s.

**MATH 136: BRUNO BARBOSA**

“I talk to you guys more than I talk to my mother.

**MATH 146: SPIRO KARGIANNIS**

“If you do  $T$ , then do nothing, then you’ve just done  $T$ .

**MATH 311 (AT EPFL): DOMENICO VALLONI**

“*[While pointing at a giant commutative diagram]* If I do this, and then this, and then this, it’s the same as this, then this—let me use colours, hold on.

“Too many names. I don’t know what to call [this map]. I will just call it “map.”

“Do I write the argument or is it clear? *[Students stare blankly]* I write the argument.

“*[Sees student with head on desk]* Tired? I’m sorry, it probably won’t be better in two hours.

“It’s just tricks; there’s no philosophy behind it. Unless there is a philosophy of tricks.

**MATH 317 (AT EPFL): ALINE ZANARDINI**

“*[Draws a triangle that is very definitely not equilateral]* Okay, pretend this triangle is equilateral.

“*[Student: points at symbol on the board and asks what it is]* I think this was supposed to be a zeta, but... you know, some Greek letter.

“Student: Some of us are taking number theory, too.  
Professor: What are you doing in number theory?  
Student: That is a good question. Who knows.

“Sorry, I forgot how to say the numbers in English.

“Turns out 283 is a prime. Who knows that, but whatever.

“What are you doing to study? *[Students say nothing and try to avoid eye contact]* Okay, none of you are studying.

**MATH 327 (AT EPFL): MATHIAS BRAUN**

“You don’t want to see Mike Tyson, you want to do complex analysis.

“*[Man enters classroom, apologies, says he just needs to take something, grabs a plank of wood sitting on the floor and leaves]* Unfortunate; I wanted to show you some complex analysis with that plank.

**PMATH 352: MICHAEL RUBINSTEIN**

“Say you’re holomorphic just on an annulus. Then you can’t remain holomorphic throughout your journey because you’ll go through the danger zone.

“ Professor: How do you spell centre?  
 Student: Well, there’s either the Canadian form or the other one.  
 Professor: [Writes *centre* on the board] Okay, so like that... although we might have to start writing it the other way if we get invaded.

“ It doesn’t matter what letter we use at this point.

“ Do not disobey me.

“ Cauchy’s theorem is one of the greatest achievements of humanity. One of the greatest achievements of us monkeys.

PMATH 365: JASON BELL

“ If you’re ever in a debate and you say, “Oh, you’re just being hyperbolic,” you’ll win the debate.

“ I was raised Catholic (which means I don’t believe in that anymore).

“ Can you picture a saddle? You get on a horse, and it curves like this [gestures] because the horse curves down, and it curves like this [gestures] because the horse curves up.

“ Student: is that a capital gamma?  
 Professor: Yeah! Isn’t that cool?

“ Let’s try to get inside of Gauss’s head, which isn’t easy because he’s DEAD and he’s a genius.

STAT 230: YIFAN SUN

“ If you don’t like math, you can skip this slide.

STAT 330: YEYING ZHU

“ This is a  $W$  variable that I’m generating...  $X$  and  $Y$  are not degenerated, only  $W$  is degenerated.

## 15 THINGS TO DO BEFORE YOUR PREFRONTAL CORTEX DEVELOPS

there’s this popular idea that your brain’s prefrontal cortex—a section in the frontal lobe that controls executive decision-making, your personality, your social skills, and other similarly big-brain functions—doesn’t fully develop until you’re 25. this idea has a lot of followers. some even claim that leonardo dicaprio’s affinity for women 25 and under is because his desire for control in his relationships leads him to avoid the more sophisticated emotional connection that he might achieve with a women that has a fully-developed brain.

the idea that your brain will fully develop at the stroke of midnight on your 25<sup>th</sup> birthday doesn’t have any basis in actual science, though. obviously everyone’s brain develops at a rate unique to them, and the only consensus actual neuroscientists have been able to achieve is that brain development *does* continue into the 20s, and that on average prefrontal cortex development levels off in the mid-20s.

but regardless of whether it’s actually true that 25 is *the* year that you will achieve mental nirvana and unlock a deeper level of cognitive locking-in, it *is* true that you are only young once! and you should enjoy your youth and the forgiveness that it affords you for your bad decisions while it still lasts. so here are some fun things to do before your prefrontal cortex develops, inspired by my friend, who inspired me to write this after she told me about *her* pre-prefrontal-cortex-development bucket list.

1. date leonardo dicaprio
2. touch a goose

3. try at least 3 hobbies that you’re interested in. be aggressively mediocre at all of them if necessary. be comfortable with that aggressive mediocrity
4. do some trespassing
5. walk 50k steps in one day
6. be vegetarian for a month
7. be VEGAN for a month
8. go to an art gallery with a friend, preferably one with paintings dating before the 1700s. look at every painting with a baby in it and come to a consensus on whether or not the artist actually knew what a baby looked like (or if they just painted a small adult human). now do it with various animals.
9. bomb, on purpose, an interview that you don’t really care about
10. go on a solo trip somewhere that you’ve always wanted to visit
11. go on a road trip with your friends and have at least one near-death experience while driving
12. ask your crush out (not leonardo dicaprio)
13. host friendsgiving as an excuse to attempt to deep-fry an entire turkey
14. do something really fast. run really fast down a hill. bike really fast down a hill. ski/snowboard down a double black diamond hill. drive above the speed limit (but safely!). bungee jump. skydive.
15. experience the feeling of being one person in a massive crowd. go to a protest for a cause you believe in. sing along to every song at a concert. play in a large musical ensemble.

# A NUMBER PUZZLE FOR YOU

## EXISTENCE OF SOLUTIONS NOT GUARANTEED :D

You know that one game where you're given a few digits in a certain order, and then have to place math symbols between them to make an expression equal to some target number (e.g. a solution to the puzzle  $2\ 2\ 2\ 2 = 8$  is  $2 + 2 + 2 + 2 = 8$ )? Well, here I am the night before the submission deadline, having set up a massive puzzle of that kind that I started writing too late and only partially solved, and I value my sleep too much to solve it in its entirety. So, dear reader, I'll leave you to try the questions I couldn't finish on time for yourself (and feel free to look for fun alternative solutions too!), and apologies in advance for any obvious solutions I missed out on. Give the puzzle a shot below:

**Rules:** You may only place  $+$ ,  $-$ ,  $\times$  (or  $\cdot$ , or nothing if appropriate, you do math you know the drill),  $\div$  (or  $/$ ),  $\sqrt{\quad}$ ,  $(\quad)$ ,  $!$  (with a nonnegative integer  $n$  followed by  $k$  factorial symbols evaluating to the product of all positive integers less than or equal to it that are also congruent to  $n$  modulo  $k$ ),  $^{\quad}$  (representing exponentiation), and  $.$  (decimal point) between or around numbers, and there is no restriction on how many you can place as long as the expression evaluates to the goal number. Concatenation of digits is also allowed. Ideally, use operations that are as simple as possible. As an *absolute last resort*, you can use floor and ceiling brackets.

### Problems:

$$2 \cdot 0 \cdot 2 \cdot 5 = 0$$

$$(2 + 0! + 2)/5 = 1$$

$$2 + 0 \cdot 2 \cdot 5 = 2$$

$$(2 + 0! + 2)!! + 5 = 3$$

$$-((2 + 0!)! - 2 \cdot 5) = 4$$

$$2 \cdot 0 \cdot 2 + 5 = 5$$

$$(2 + 0)/2 + 5 = 6$$

$$(2 + 0!)! \cdot 2 - 5 = 7$$

$$2 + (0/2)! + 5 = 8$$

$$2/0! + 2 + 5 = 9$$

$$2 \cdot 0 + 2 \cdot 5 = 10$$

$$(2 + 0)/2 + 5!!! = 11$$

$$2 + 0 + 2 \cdot 5 = 12$$

$$2 + 0! + 2 \cdot 5 = 13$$

$$2 + 0 + 2 + 5!!! = 14$$

$$2/0.2 + 5 = 15$$

$$2 + 0 + (2 + 5)!!!! = 16$$

$$2 \cdot 0 + 2 + 5!! = 17$$

$$2 + (0 \cdot 2)! + 5!! = 18$$

$$(2 + 0 + 2)! - 5 = 19$$

$$(2 + 0) \cdot 2 \cdot 5 = 20$$

$$2\ 0\ 2\ 5 = 21$$

$$2 \cdot ((0! + 2)! + 5) = 22$$

$$2\ 0\ 2\ 5 = 23$$

$$2\ 0\ 2\ 5 = 24$$

$$2\ 0\ 2\ 5 = 25$$

$$2\ 0\ 2\ 5 = 26$$

$$2\ 0\ 2\ 5 = 27$$

$$2 \cdot 0 + (2 + 5)!!! = 28$$

$$(2 + 0 + 2)! + 5 = 29$$

$$2 + 0 + (2 + 5)!!! = 30$$

$$2\ 0\ 2\ 5 = 31$$

$$2\ 0\ 2\ 5 = 32$$

$$2\ 0\ 2\ 5 = 33$$

$$2\ 0\ 2\ 5 = 34$$

$$2\ 0\ 2\ 5 = 35$$

$$2\ 0\ 2\ 5 = 36$$

$$2\ 0\ 2\ 5 = 37$$

$$2\ 0\ 2\ 5 = 38$$

$$2\ 0\ 2\ 5 = 39$$

$$2\ 0\ 2\ 5 = 40$$

$$2\ 0\ 2\ 5 = 41$$

$$2\ 0\ 2\ 5 = 42$$

$$2\ 0\ 2\ 5 = 43$$



$$2 \ 0 \ 2 \ 5 = 44$$

$$20 + 25 = 45$$

$$2 \ 0 \ 2 \ 5 = 46$$

$$2 \ 0 \ 2 \ 5 = 47$$

$$2 \ 0 \ 2 \ 5 = 48$$

$$2 \ 0 \ 2 \ 5 = 49$$

$$(2 + 0) \cdot 25 = 50$$

**Bonus:** What is the smallest set of operations required to make this puzzle solvable?

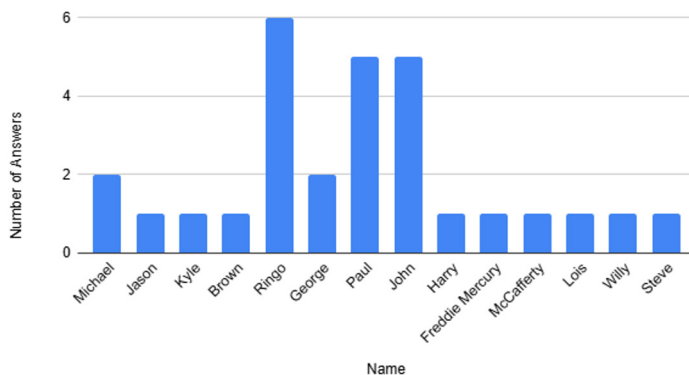
*the government's only spy*

## MICHAEL, JASON, KYLE, AND BROWN: MATH CND NAMES THE BEATLES

A few weeks ago, I was discussing the Beatles with my girlfriend when she asked me, “can you even name the Beatles?”

Jokingly, I said their names were John, Jerry, and Brian. After wearing out the John-Jerry-Brian bit, we started to wonder: can an average person of our generation actually name the members of the Beatles? So, being a reputable investigative journalist, I took to the epicenter of math student activity, Math CnD. I asked eight random individuals in CnD to write down the names of the members of the Beatles. Previous answers were obscured to ensure the participants were not influenced by them. Here are the results:

Number of Answers vs. Name



The first answer I received was by far the most comical. One of two people surveyed who clearly had no knowledge of The Beatles, this participant claimed the Beatles were named Michael, Jason, Kyle, and Brown. To their credit, this person did name four people.

The number of Beatles proved to be a contentious topic. Three participants provided answers with a number of Beatles other than four. Two of those participants said there were five Beatles, while the other said there were only a meager two.

Of the five participants that did name four Beatles, only two named all of them correctly. Four participants named at least three correct Beatles. One of them couldn't remember the last one and the other thought there were two more. Shockingly,

the most remembered Beatle was Ringo Starr. I conjecture that his unusual name led to people remembering him. The most forgotten Beatle was George Harrison. Of all the participants, the only people to remember George were the two participants that gave fully correct answers. Everybody else forgot him. Sorry, George. Not even Canada's finest institutions are immune to pro-Clapton propaganda.

Surprisingly, a woman was named as a member of the Beatles. One participant claimed that there was a Beatle named Lois. Congratulations, Lois, on your appointment as the first female Beatle.

One non-Beatle celebrity was said to be a Beatle, and that was Freddie Mercury. This was said by the participant who only offered two names, the other being Harry. Freddie Mercury is a very specific name, but Harry is so vague! I wonder who they meant? Harry Potter? Harry Truman? Harry Styles? We will never know.

Of all the incorrect names, one name proved to be very popular amongst Beatle-namers: Michael. Rather poetically, the last participant also said that there was a Beatle named Michael. We opened and closed on Michael.

And there you have it, folks. Does Gen Z know the Beatles? I can't say. I only surveyed eight people.

*numberonerubinsteinfan*

## Enjoying mathASKS?

## Thank Professor Furino. It was his idea.

A mathNEWS EDITOR WHO BELIEVES  
IN CREDIT WHERE CREDIT IS DUE

# LAST WEEKEND

*Friday, 5:00pm.* I close my work laptop and grab my backpack, making sure I have everything. Toiletries, clothes, phone charger, check. Quickly, I move out the door. My train leaves at 6, but I should be able to make it comfortably as long as I have no delays.

My plan is to make it to Toronto for Friday night and spend Saturday with *Not A N\*rd*, then spend Family Day weekend in Niagara celebrating my brother's birthday, before returning to Montreal on Monday night.

*Friday, 6:00pm.* My train leaves Gare Central. *Good timing*, I think. *This trip is five hours long. I'll make it to Toronto by 11, and I'll be able to meet Not A N\*rd today, if only with a few minutes to spare.*

*Friday, 8:00pm.* The birthday party is officially called off. My family doesn't want to be out on the roads Saturday or Sunday, which means I need a second Airbnb in Toronto. I book it on the train.

*Saturday, 12:30am.* My train pulls into Union Station, delayed by an hour and a half. I check the address of our Airbnb, looking for the quickest route by subway. There must be a quick subway route, right?

*Saturday, 12:40am.* I step outside to begin walking to the Airbnb. It is  $-15^{\circ}\text{C}$ , and feels colder.

*Saturday, 12:45am.* I am almost hit by a car.

*Saturday, 12:50am.* I am yelled at by a stranger I try to pass on the street.

*Saturday, 12:55am.* I catch a young woman in a dress and heels who nearly wipes out trying to climb a snow mound while crossing the street.

*Saturday, 1:05am.* I am almost hit by another car.

*Saturday, 1:10am.* I reach the Airbnb. *Not A N\*rd* greets me, grateful I didn't show up at the wrong hotel this time. (It wasn't my fault. Long story.)



*Saturday, 5:25pm.* We anxiously check the time. The AGO closes in 15 minutes, and the storm seems to be picking up. We're hesitant to wait too long to leave, lest they cancel our train and we're stuck in Toronto. We realize we should pick up food, in case we can't leave our Airbnb on Sunday at all.

*Saturday, 5:40pm.* We're at the grocery store. We accidentally cut the checkout line. The cashier is very passive-aggressive about it. We purchase a premade chicken dinner for lunch tomorrow while the whole store glares at us.

*Saturday, 6:15pm.* We miss our GO train to Mississauga and go get lunch at the Union food court.

*Saturday, 6:45pm.* We spend so much time interrogating my taste in perogies that we miss a second GO train to Mississauga.

*Saturday, 7:05pm.* We arrive at Long Branch GO. I confidently claim that the buses can take us to Airbnb number two in ten minutes. I pull out my phone to verify. The bus ride is actually 45 minutes. I zoom out on Google Maps. We actually got off at Mimico.

We order an Uber.

*Saturday, 7:15pm.* Our Uber driver misses a lane change on the highway. Undeterred, he makes an illegal merge through a snow bank during a blizzard. I see my life flash before my eyes.

*Saturday, 7:25pm.* We step out of the Uber in front of Airbnb number two. It pulls further into the street to try and turn around. *Not A N\*rd* pats her jacket and asks if I can call her phone. I remember that her phone case holds her debit card and ID. I see *her* life flash before my eyes.

We frantically wave down the Uber driver to stop as he comes back around. We search the backseat and find nothing. We're about to tell him to keep going when we spot it on the ground, in the middle of the road. If the car had driven on, it would have run over the phone.

*Saturday, 7:30pm.* We take a nap.

*Saturday, 11:00pm.* Waking from the nap, *Not A N\*rd* asks if we remembered to put the chicken in the fridge.

*Sunday, 11:30am.* We share a gourmet lunch of one apple each and a bag of baby carrots to split.



*Monday, 10:00am.* I leave the Airbnb. *Not A N\*rd* left the day earlier, and now I need to get to Union for a 3:15pm train to Montreal.

*Monday, 1:00pm.* My train to Montreal is cancelled without replacement. *Fuck.*

*Monday, 2:30pm.* With the roads mostly clear, I am finally picked up by my aunt in Burlington.

*Monday, 4:00pm.* Before I showed up, they were planning to see the new Captain America movie. I come along with them. The ticket cost \$20. The movie was bad.



*Tuesday, 8:30am.* I arrive at Aldershot GO. My VIA to Montreal is only at 3:15, but I don't entirely trust I'll be able to get a non-delayed train to Union. I miss the 8:25 train, and resolve to wait until 8:55.

*Tuesday, 8:35am.* I get on the 7:55 train, which was delayed until just now.

*Tuesday, 2:25pm.* I arrive back in Union Station, after spending some hours downtown killing time. I make my way to the VIA concourse. After all, we could start boarding any minute.

*Tuesday, 2:30pm.* A freight train derails in Dorval, along the Windsor-Quebec corridor.

*Tuesday, 7:00pm.* I board a train to Montreal, four hours late. Well, really, it's 28 hours late, but who's counting?

*Wednesday, 1:30am.* I arrive in Dorval, one stop away from Montreal. The woman on the intercom says that the train ahead of us is stuck because of a frozen switch. She gives us the chance to get off the train and arrange our own rides home. Everyone around me takes this offer immediately.

*Wednesday, 1:40am.* My Uber driver arrives. I step into the backseat. I see he has taped a tablet to the back of his seat, on which he is playing *The Godfather (1973)* for me to watch. I decide I'm too tired to ask any questions.

*Wednesday, 2:00am.* I finally unlock my front door and collapse on my bed.



*Wednesday, 7:45am.* My alarm goes off. I groan, then slowly get up to go to work.

Dick Smithers

## SUDOKU 5

### PUZZLES

			3			7		8
9	4		7					1
		3		1				
					4	8	2	
	1	9				4		
	3							
				5			1	7
2			6	4			5	
					1			

Sudoku 5

5	1	2	8	3	9	6	4	7
3	8	7	5	6	4	2	1	9
4	6	9	1	7	2	3	5	8
8	4	3	6	2	1	9	7	5
7	9	5	3	4	8	1	2	6
6	2	1	7	9	5	4	8	3
2	5	4	9	8	3	7	6	1
9	7	8	4	1	6	5	3	2
1	3	6	2	5	7	8	9	4

Sudoku 4 Solved

# PROBABLY THE CRAZIEST FACTS YOU'LL HEAR ALL WEEK

## THREE ABSOLUTELY BONKERS WORLD RECORDS

I hope you appreciate some concise expository on truly the most impressive feats I've ever witnessed, all from this past seven days.

### JACOB KIPLIMO — 56:42 HALF MARATHON RUN

Jacob Kiplimo had held the Half Marathon world record for the last 3 years, with a time of 57:31, but in October, Yomif Kejelcha achieved a 57:30.

But Jacob was cooking. Last week, he started out his 21.1 km race like an absolute lunatic. His opening 10 km was so fast, it would've ranked as the 4<sup>th</sup> fastest 10 km run of all time, at 26:46—even faster than his 10 km personal best of 26:48. So you would think he would slow down.

He did not. He sped up. He ran his next 5 km at a pace of 2:36 / km, making his 10 km split from 5 km to 15 km half a minute faster than his already historic opening 10 km, clocking in at 26:13, just 2 seconds short of the 10 km world record. More impressive still, he unofficially broke the 15 km world record by 53 seconds with a split of 39:47, the world's first sub-40 15 km under any conditions, including illegal ones.

His final time of 56:42, a drop of 48 seconds, was the largest improvement on the half marathon world record since 1967.

### JAKOB INGEBRIGTSEN — 3:45:14 INDOOR MILE RUN

For six years, Yomif Kejelcha's 3:47:01 was untouched, until two weeks ago, when both Hobbs Kessler and Yared Nuguse, on the same day, dropped the record down to 3:46:90 and 3:46:63, respectively. Jakob Ingebrigtsen ran 3:45:14 just five days later, in his first ever indoor mile.

Yet, he also officially broke the 1500 m world record that day too, beating his own three-year-old 3:30:60 with a 3:29:63.

### YIHENG WANG — 3.08 SECOND 3X3X3 RUBIK'S CUBE SOLVE

Max Park's 3.13 second solve had stood for nearly 2 years. That solve had the fastest turns-per-second (TPS) for a world-record solve ever, at 10.53 TPS. Before Max's record, every world record in history had a TPS below 9, and most top speedcubers believed 10 TPS in a world record was simply impossible.

Yiheng Wang did 15.4 TPS. Also, he's 11 years old.

# TWO GEESE ABOVE THE CLOUDS: A WATERLOO X LAURIER FANFIC

“Hey, watch it!”

Bleary eyes met the piercing baby blue orbs of another.

“Uhh whaaa?”

Vivacious Gartholemew Owl had just grabbed a black coffee and was trying to make it to one of the prized booth seats of the acclaimed Math CnD, obviously the only good place to study in this accursed building. It gave him a chance to look at the snow falling lightly outside the building. Vivacious was the kind of guy who always blended into the background—by choice. He wasn’t looking for needlessly cheerful casuals talking to him.

Of course, he was never completely able to blend in, despite looking rather plain, because it was always the faint smell of not showering that hit anyone near him first. Had someone been paying attention to his outfit, they would know he hadn’t changed out of his oversized black hoodie after sleeping in the trains lab for the past few days.

“Are you fucking deaf? Out of my way Waterloser.” The haughty voice came from an intimidating presence, towering over poor Vivacious. He was standing at 6’7”, broad-shouldered, smug smirk, blond hair casually falling over his beautiful blue orbs. Vivacious was almost stunned by his beauty, until he pulled himself together, remembering he didn’t care about any of this stuff. None of this meant anything, because Vivacious didn’t care about romance. Not at all. Besides...

“Literally no Waterloo student would ever say that, who even are you, you-you POSER!” A hushed silence fell over the CnD. This was a serious accusation. The beautiful tall blond looked down at the small, shaking (it’s the coffee, he swears) CS student, his eyes narrowing. He closed the gap between him and Vivacious. “Just what are you accusing me of?”

Vivacious could feel the man’s breath on his cheek. He nervously adjusted his glasses. “You...you look like a LAURIER STUDENT!” A gasp filled the room, glasses shattered, and disapproving glares were thrown toward the blond. However, he looked unbothered; he simply got up and took a bite of his donut. “No I’m not,” he said coolly, “I’m just not in math.”

*Ohhh*, Vivacious thought. *Well okay that makes sense*. The gasps died down and keyboard clicking returned as normal around CnD. Well, except now Vivacious had a mildly pissed but very distractingly handso-blond guy who was sneering at him. “What, am I not allowed to study in your precious ugly math building?” A dangerous fire flickered in Vivacious’ eyes, barely restrained. Only math students were allowed to shit on MC! “You don’t even look like you’d be able to study,” he grumbled.

“Oh, what was that?” The blonde was clearly trying to keep his cool, but his hands were shaking with barely contained

rage. Suddenly, as if a terrible idea had crossed his mind, his beautiful blue orbs lit up, and a smile played across his lips. “Well, maybe you don’t know me yet, but I’m happy to change that. I’m Jasper Draco Falcon,” he reached out his hand invitingly, “Join me for a study session?.”

Vivacious was taken aback by his boldness, biting his lip and averting his gaze to try and hide the fire pricking his cheeks. “I’m Vivacious,” he reached out his hand to try and shake Jasper’s, then remembered he hadn’t felt human touch since shaking his last co-op interviewer’s hand, and blushed again, “and sure.”



Vivacious groaned into his tear-stained notebook. He had seventeen midterms in the next week, and really couldn’t afford to be throwing away his day to be looking at Jasper Draco Falcon and his dumb beautiful hair and dumb flirty smirk and dumb beautiful blue orbs. Jasper looked unbothered, casually typing away at whatever he was working on. Vivacious hated him all the more for it.

“Hey, Viv.”

“Fuck you. Don’t call me that.”

Jasper chuckled, rich and smooth like honey. “I’ll call you what I want, sweetheart.” Viv seethed silently. Jasper was getting more annoying with every passing minute. Jasper sighed and pulled out a vape. “I’m stepping out to the balcony for a while. Be back in a bit.”

Vivacious watched Jasper on the balcony as the delicate flakes of snow danced through the air, settling on Jasper’s hair and shoulders like a soft caress, and felt a twinge of jealousy. He looked back in front of him and noticed Jasper’s computer, and suddenly nosiness overcame him. He realized he didn’t even know Jasper’s major. What was he working on? Peering over at Jasper’s computer, he looked over to see...a presentation on “Market Entry Strategies for Emerging Economies.” *What the fuck?*

Vivacious rushed out to the balcony, ignoring the biting cold on his skin that hadn’t felt the outside world in days. He breathed in shakily.

“I know what you are.”

Jasper’s glare darkened and his blue orbs turned icy-blue. “Say it.”

“A Laurier student,” breathed Vivacious.

The air turned even colder, the tension so thick it could be cut with a knife.

“Waterloo really is where the vampires hang out,” Jasper chuckled darkly. “Guess I was more dangerous than you thought.” The cloud of cotton-candy vape around him seemed to mirror his mood—heavy, thick, and full of something unspoken. He took one last drag and turned around.

Jasper put his hand on the balcony door and pushed. It did not budge.

“Hah,” Jasper laughed humourlessly, “We’re locked out.” A sudden gust of wind came through the balcony, ruffling Jasper’s hair and making Vivacious realize he’d forgotten to take his coat.

“No way,” Vivacious grabbed the door handle and pushed as well. It did not budge.

Jasper eyed the poor shivering CS student, sighed, and pulled him into his muscular veiny arms.

“Wh-wh-what are you doing??” Vivacious stammered.

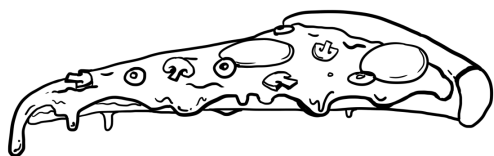
“You’re literally gonna freeze to death. There’s nobody else around at 3am, at least this way we both warm up,” Jasper retorted coolly. Vivacious wasn’t sure if it was his hypothermia-addled brain, but he decided that this was totally cool and normal. “Mm,” he purred, pressing himself even closer. His breath hitched as he felt the tension rise. It wasn’t just the cold now. He could feel the weight of their closeness, the slow burn that had been building between them all day.

“Are you sure you’re not too cold, Viv?” Jasper murmured, voice husky from the cool air. Vivacious looked deep into his cerulean orbs. “Literally shut the fuck up and kiss me.”

Jasper wasted no time. He effortlessly pulled Vivacious up and pinned him against the window. Vivacious passionately kissed him in return, “I’ve wanted to MC you with clothes off all day.” he breathed between their tongues dancing like the SLC salsa classes. Like the beating of two hearts. “I’m gonna be a warrior for you tonight.”

Suddenly, Jasper stopped. “Wait,” he growled, a dangerous glint in his orbs. “I wanna see your golden hawk.” *Please don’t step on my golden hawk*, thought Vivacious.

They soared together, higher and higher, like two geese flying above the clouds. Their swords fought like the Waterloo Kendo Club. Vivacious’ programmer socks stayed on. At last, they both lay panting and sweating on the balcony, tired but no longer cold. They lay snuggling against each other, the snowflakes landing on them turning instantly to steam.



REAL PHOTO TAKEN FROM THIS TRUE STORY



A tired maintenance person opened the balcony door and saw the two naked bodies in the snow. *Not this shit again*, he thought. He put a sign on the door to prevent this from ever happening again.

“Pull, Not Push”



17 years later...

Molasses Gartholemew Falcon scrolled endlessly through all their university options, overwhelmed by the amount of choices. After all, what high school student knows what they want to do with their life? They finally stumbled across a webpage that intrigued them.

“Business Administration (Laurier) and Computer Science (Waterloo) Double Degree”

Not a N\*rd, in collaboration with  
peacelovemath, Nike, Lars Nootbaar, and Joe

## MYSTERY CODE

figure out what this function does with a correct explanation of how it works written as a **mathNEWS** article and I will give you a high five.

```
long double mystery_function(long long unsigned_
↳int in){ unsigned long long o = 0; unsigned_
↳long long f = 0; for (int i = 16; i > -40; i--
↳) { f *= 4; f += i ≥ 0 ? 0×03 & (in >> (2 *_
↳i)) : 0; o *= 2; if (o*2 + 1 ≤ f) { f -= o_
↳+ 1; o++; } } long double a = 0; for (int i =_
↳-1; i > -40; i--) { a ≠ 2; } return a; }
```

# WHY YOU SHOULD WATCH HAIKYU!!

## EVEN IF YOU HATE SPORTS!

Let me start off by saying that I am not a sports person. This is relevant because for those of you that don't know, *Haikyuu!!* is an anime about volleyball. I knew nothing about volleyball going in, but I *am* an anime fan, so I'd say that leaves me at least semi-qualified to talk about it. I have heard too many people hear about *Haikyuu!!* and say, "Oh well, it's about volleyball and I'm not interested in volleyball, so I don't think I'd like it." I find this a silly conclusion to jump to and so I am writing an article that I can copy-paste the next time anyone says this within earshot. Even if, like me, you don't care about volleyball or any sport, and heck maybe even if you don't like most anime you've seen, there is still a very good chance that you will greatly enjoy *Haikyuu!!*, and I am going to explain why.

So, with that claim out of the way, let's make one thing clear: *Haikyuu!!* is very much an anime about volleyball. The show follows the Karasuno highschool boys volleyball team, as they play highschool volleyball. A lot of the runtime of the show is spent playing volleyball or practicing for volleyball. The rest of it usually follows the boys interacting with an opposing volleyball team before a big game, or studying for a test that they have to pass to still be allowed to play volleyball, or flashing back to their past so you can learn how they got into volleyball, etc. Despite this, even if you find real-life volleyball very boring or even painful to watch, you will still enjoy this show.

Watching this show has kind of made me realize that if someone thinks that they find sports inherently unexciting, it might be a misconception. I think two of the biggest things that turn people off of watching sports are either a) that they don't understand what's going on, or b) they find it repetitive. Additionally it could be c) that they aren't invested in the outcome, though it's difficult to claim that that's inherently true of all sports. Regardless, *Haikyuu!!* solves all these problems. They outline the rules of the game very early on, in a way that's easy to understand. After this, they only sometimes explain niche rules when they're relevant, so you won't feel like it's constantly being hamfisted to you. When something important is happening, they focus on each moment and show you what's happening rather than telling, so it's very easy to stay engaged without being taken out. They also never focus on a full game of volleyball, only showing the important moments that have the most impact and often skipping over entire sections of the game that wouldn't be as interesting to follow. *Haikyuu!!* makes sure that the viewer is always able to stay engaged, and that will be true regardless of how you feel watching regular sports.

In terms of investment, that's where the characters and ongoing plot come in. The ensemble cast are all so fun, and throughout the course of the show you get to learn about all their personalities, court positions, backstories, strengths and weaknesses, and watch them grow as individuals and as a team. You end up caring about their endless devotion to keep playing their favourite sport, and the show makes it quite clear that if they lose too many games, they won't be able to

anymore. Unfortunately for them, *Haikyuu!!* is not afraid to let its protagonists lose. It actually feels a bit hard to believe considering how talented each of the members are, but they frequently go up against teams that are better than them, and they lose. It hurts, but they get back up, and they practice and they grow even stronger and get better as a team, and they get into another game and try again. But the other teams have been practicing too, and gotten even stronger as well, and they might lose *again and again*, but when they finally pull off that win against all odds it feels so satisfying, because after going on this journey with them you want them to succeed.

The characters are good for getting you invested in the outcome of the game, but the thing that really makes this show so engrossing to watch is the writing of the games themselves. I really must emphasize, if you think that sports are boring to watch, you have never watched sports like this. I've watched a lot of exciting anime, but I am not exaggerating when I say that this is *the most* exciting anime I have ever watched. The writing, the shots, the plot, the pacing, it feels like every aspect is just so on point once a high-stakes game starts to constantly have you on the edge of your seat. I think one thing many non-sports fans don't realize is just how much excitement professional sports can contain. There's so many micro-interactions, high-intensity moments, displays of incredible talent and luck, devastating missteps and mistakes. These things are all inherent to high-level sports if you know how to look for them, and because I and many others don't, we don't enjoy watching sports. But in a contained setting that can draw out these moments for a general audience, and elevate them with phenomenal action-writing, you get insane levels of excitement. I will not lie, watching this show makes me want to shout, and I've sometimes squealed in an effort to contain myself, I do not do this often. This show might not be very deep, it might not say anything profound or make you break down and cry, but it is *fun*, and engrossing, and that makes it incredibly enjoyable. Watching this show did not make me love sports, it did not even make me love volleyball, but it made me appreciate them more, and it certainly made me love *Haikyuu!!*. I'm sure it will for you too.

Doublewhip

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## AN EXERCISE IN METER

The dishes on my floor are more human,  
 Recalling what they do each day.  
 The insects on my walls are more present,  
 They worry not of if they're real.  
 The lamp upon my desk is more certain,  
 It needs no drug or drink to sleep.  
 I want to learn to be a person.

mN-throwaway-014



# Creative Recipes



# 1

**1** Crack a whole egg into a bowl, cover, and microwave for 45 seconds until egg white just begins to turn rubbery.

Use a spoon to separate the cooked egg from the bowl. Leave the egg in the bowl.  
Add cold milk.  
Add cereal.



*"A unique texture... hot and cold fusion... perfect for breakfast"*

**2** Store apples and elderflowers together for a couple of weeks



**3** Pick fresh dandelion flowers, keep only yellow petals.



Boil petals with 4 cups of water for 10-15 min, then let sit 2-3 hours.

Strain and keep 3 cups of liquid, add 2 tbsp lemon juice and 1 box pectin.

Boil the mixture, then add 4 cups of sugar, stir, and boil for 1-2 min.



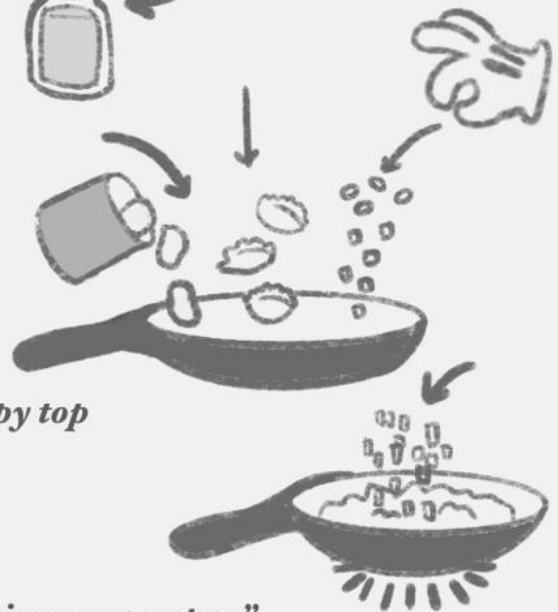
Pour hot jelly into sterilized jars, leaving space at the top.

Seal Flip jars upside down for 5-10 min, then cool.

Store in fridge (3-4 weeks) or use hot water bath (1 year).



**4** Add your favourite pasta sauce to oven safe pan  
add your favourite frozen dumplings  
top with favourite non-cheese pizza toppings  
cook until dumplings are finished  
top with cheese and put under the broiler until crispy top



*"it's super easy and tastes good. it's kind of like if pizza was a stew"*

# LONG LIVE THE POOP GAME

**YOU DON'T KNOW GOT TILL ITS GONE... (BASEBALL CONTENT FOR PEOPLE WHO DON'T WATCH BASEBALL PART 3).**

Eventually, no matter our faults, father time comes for us all. In the year 2000, Blockbuster was offered the chance to buy Netflix for 50 million; their CEO laughed them out of the room. Eventually Netflix replaced Blockbuster. Uber replaced the taxi driver. Manufacturing jobs will soon all be automated. Accountants will soon be only various TurboTax software available at Costco. The rapid progression of technology is inevitable (except for AI which will hopefully fail soon).

Take the PooP series. For over a decade, whenever the Pittsburgh Pirates and Philadelphia Phillies played each other, an interesting phenomena occurred. Was it the bitter rivalry between the East and West of Pennsylvania? No! It was the PooP series, consisting of 3–4 PooP games. See, the logos of both the Pirates and the Phillies are a stylized “P,” and when the score of the game was 0–0, magic occurred:



The PooP series was celebrated amongst baseball. It was one of the most popular Pittsburg Sports event, excluding the Furrries at Anthrocon.<sup>1</sup> However, change comes for us all. Just a few weeks ago, NBC Sports Philadelphia released their new logo:



Since the 1800s the world has moved ever forwards steam-rolling everything in its path, good or bad. We say it's for the better, but do we ever stop and think? Do we ever mourn the losses, or do we move on to what is next? Our capitalist system prioritizes growth over all, but what happens when we can grow no longer, what happens when we stagnate? Will we keep pursuing change for change's sake?

Anyways, did you see what the Portland Pickles mascot did?<sup>2</sup>

Lars Nootbaar

Source: <https://awfulannouncing.com/local-networks/nbcs-philadelphia-new-scorebug-poop-game-pirates-phillies.html>

- <https://www.mlb.com/news/pirates-andrew-mccutchen-summons-the-power-of-anthrocon>
- <https://nypost.com/2022/01/14/mascot-in-hot-water-for-exposing-his-pickle-on-twitter/>

## CHICKEN BREAST HNNFHGHG

### INGREDIENTS

- 2 chicken breasts
- salt
- oil
- ground pepper (optional)
- garlic powder (optional)
- smoked paprika (optional)

### DIRECTIONS

1. Cut chicken breasts in half so you have 4 thin chicken breasts
2. preheat oven 400 degrees
3. heat pan on medium, add oil
4. season chicken breasts with your seasonings (both sides)
5. add chicken to pan
6. cook both sides, about 2–3 mins each
7. put chicken breast on parchment lined baking sheet
8. put in oven for 10 mins
9. yum yum it is done

When you eat it, you will say “mm this sure is chicken breast” and you will be nourished for a while I guess. Kachow

xoxo

yummyPi



# UNIVERSITY OF WATERLOO ANNOUNCES M8, AN ALL-NEW MATH BUILDING TO BE CONSTRUCTED ATOP M7



ARTIST'S RENDITION

Dick Smithers

# mathNEWS

# A EULOGY TO A PILE OF NAPKINS

*PLEASE JUST GIVE ME LIKE ONE NAPKIN ON GOD*

Upon my wayward travels where I always dine out,  
Restauranters always hand me a pile of excess,  
Yet I always only needed but one, and the rest  
they have naught to do but to grow in number  
in an inexorable pile on the kitchen countertop.

One wonders what to do with these towelettes  
Piles at home, at rentals, at work; perhaps its fated  
No spills to clean, no mouths to wipe, their strengths are  
wasted  
meant for jobs that never materialized  
and perhaps in this way we are alike.

The pile forever grows, no end in sight  
Perhaps, one day, this barely useful collection  
may finally be resurrected from the grave  
and we can recite this eulogy in reverse with satanic praise  
for these napkins can finally see the light.

Yet for now, dormant it must stay.

andoiii

## ISSN 0705-0410

UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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# NOTHING HAPPENED

For almost half of her life, Nana lived in a house above the sea. I exaggerate a bit, of course. It wasn't anything dramatic or romantic like in the movies. No windswept vistas with rustling grasses, empty for miles. No sharp cliffs falling away to jagged rocks and crashing waves. Hers was a house tucked away on a lush hill tumbling down to a calm, stony beach squished between two half-unearthed boulders that blocked any further ventures along the waterline. Stumbling down the hill from the house was a wooden staircase made steady by whatever foundations could be heaved up from the earth on its uneasy way down. In one last scramble for space, a wooden pier stretched as far as it could muster before giving way to the shallow water. It was a sheltered place, with the bordering stones and the overhanging trees and Nana's house watching over it all.

In one small corner of this scene, at the base of the railing at the bottom of the stairs, an unassuming piece of cast iron was screwed into the aging wood. Climbing away from the shore, its words lay silently under passing fingers,

IN 1832 ON  
THIS SPOT  
NOTHING  
HAPPENED



Shaded by leaves, the plaque was an easy thing to miss. Even if it did catch your eye, its text strained understanding. Salty air had rusted its edges over decades of exposure and lichen had bloomed on it as if it too were as alive. It was part of the ecosystem, both human and natural.

It had been there ever since I could have noticed it, and probably for many years before. By the time I could peek over the railing's edge, I had read this message, or at the very least seen it. That is all I could have done, really. See. Read. Remember. Move on. But understand? That was something else entirely.

In a more innocent time its meaning escaped me. Its words were simple, to be consumed one at a time and crushed together in a young and still-developing brain into some base semantic form. I had devoured plaques like these before. Most showed someone famous, something memorable, anything of any note at all. Why would this one, in a place of historic nothing-happenedness, be so important to Nana, or to whoever came before her? So important, in fact, that this thing was fixed into the very structure on the climb back to her house?



It was a kitschy piece, the kind you would pick up from a garden store or a roadside tourist trap. Over the years, it gained a weathered permanence, but at its core it was still the same.

With a less young and more developed brain, its humour dawned on me. It does not celebrate some piece of history; it makes fun of the celebration itself. Historical signs beg for our reluctant attention with a story of the ground it stands on. Some justify their own existence, others do not, and more still fail to catch even a passing glance. Famous battles were not fought on every inch of soil and famous people were not raised in every house. More often than not their stories fly through our consciousness, finding no grip in our memories. They hold importance for the men (mostly) of the societies who put them up in the first place and few beyond that. Tucked away in the corner of some dead Victorian business magnate's massive estate lands, the dock of Nana's home, built less than half a century ago, would struggle to make it into the history books.



The sign was a thing to glance over, have a chuckle at, and forget. A piece of home decor that "completes the look."

In time, though, its message began to sour. There were probably a great many things that happened here, if not in 1832 then in some other bygone year. Mi'kmaq had certainly lived here for eons during the immemorial part of time immemorial. Living, fishing, hunting—they certainly did not spend their time doing nothing. Or something more recent, perhaps, after Europeans drove them out and filled their lands with palisades and property lines and mansion houses and railways. That's not nothing. Maybe something unrecorded, something in the true spirit of the word "immemorial," if not here, then at least somewhere nearby.

If truly nothing happened on this spot in 1832, then maybe its history was something Nana had made for herself. She had lived there ever since this place was built, after all. She had raised her children here, supported her husband here, and been a grandmother here. That could not possibly have been nothing. It seemed to me this plaque that she herself had left on the stairs to the beach served to do nothing but minimize her story.



I had grown up regaled with tales of this home, ones from decades ago that were lodged in the memories of others. These stories had taken root in the walls of this house and echoed through time. I had my own memories, too. The costumed Halloween nights, the uncountable sleepovers, the many dinners at a separate "kids' table." Am I so desperate to draw out some other history from this place? Another superseding importance? Is there even a point to doing so? I don't think so. What I remember, what she remembered, that is the history of Nana's home.

Someone else owns her house now. Each time I have passed by I haven't seen anyone there, no signs of life. I can order the same metal plaque from the bottom of the stairs on

the Internet now, too. In perfect condition, shipped in three business days. No corrosion, no lichen, the white raised lettering shining brightly against a dark background. Something to mark a new place with the same nothing-happenedness. Perhaps that is what it was meant to show, that history never belonged to any one place. Instead, it belongs to us.

verdanic

# N ARTICLES FROM mathNEWS 157.3 TITLED "N..."

THERE ARE N TYPES OF MATH STUDENTS; THOSE WHO CAN COUNT AND THOSE WHO CAN'T.

- N THINGS I LIKE TO SAY (NOT CRINGE)
- N REASONS WHY WINTER IS OBJECTIVELY THE WORST SEASON
- N ARTICLES MOBPSYCHOFAN SHOULD WRITE
- N THINGS TO LOVE DURING VALENTINE'S DAY
- N ARTICLES ABSTRACTED SHOULD WRITE
- TOP N TOILETS IN MC TO THROW UP IN AFTER WATCHING FASS
- N REASONS WHY YOU SHOULD GO TO PAC POOL AT 8 AM
- N MATH 2025 GRAD PRANK IDEAS
- N FRIENDSHIP LANGUAGES

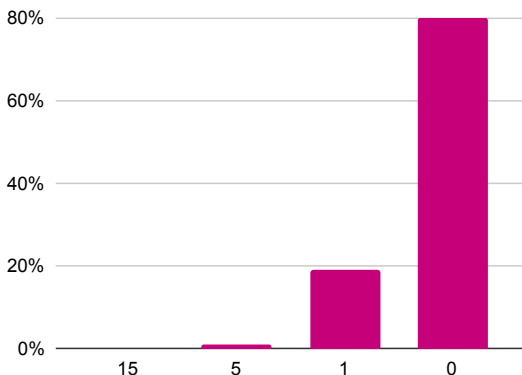
Special thanks to fellow mathNEWS writer *Whole Number Haver* who counted the number of items in their article!

- 8 WAYS TO DIVIDE CAMPUS

amirdadp

# ESSAY OVER TIME

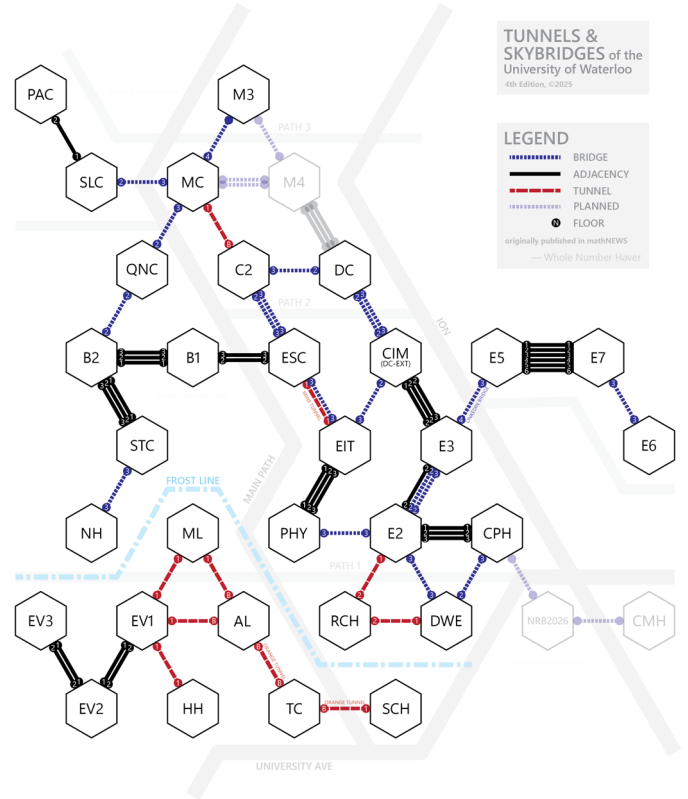
work done vs days before it's due



leah

# TUNNEL MAP V4 OUT!

apparently multiple people actually like this map so I keep updating it :000 here's a lil preview of version 4 with all the crazy m4 stuff (some of which I am making up)



you can download the full image at

<https://student.cs.uwaterloo.ca/~wkennedy/media/UW-Building-Connections-Map-v4.png>

Whole Number Haver

two *Whole Number Haver* articles in one issue? this can't be!

# DID I FAIL MY MIDTERM 18 MINUTES + 2 WEEKS AGO?

Thyme has told.

I didn't :)

Thank you for wishing me luck. I could totally (retroactively) tell.

normalparameters



# HAMMER

## MEET MY BEST FRIEND

prepare to be blessed with numerous pictures of my cat, Hammer



this is Hammer!!!



Hammer being really cute :)



this is also Hammer.



Hammer getting a belly rub

**Hammer should apply to become a mathNEWS editor!**

A mathNEWS EDITOR WHO REALLY WANTS TO PET HAMMER



Hammer watching the 4 nations final



Hammer asking for tomato paste, plz?



holding hands with Hammer



YES!!! tomato paste!!!!!!!

nike

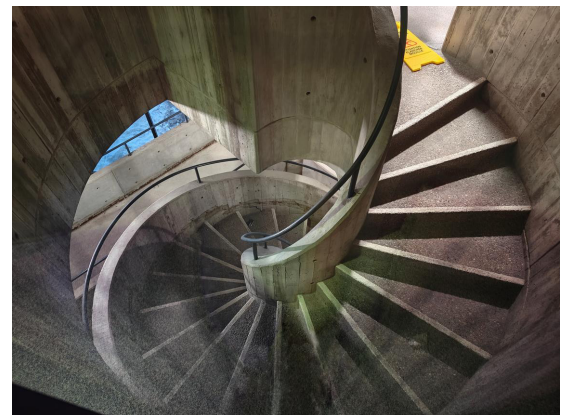
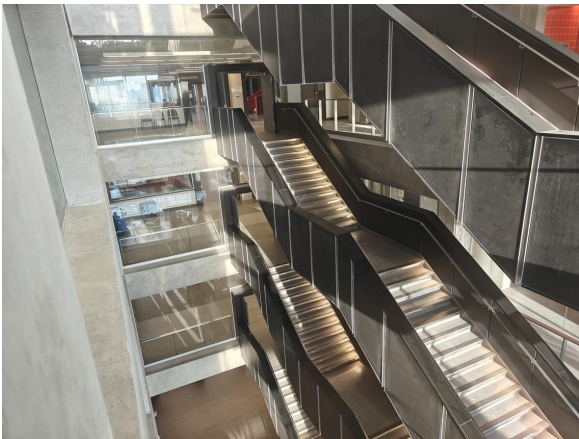
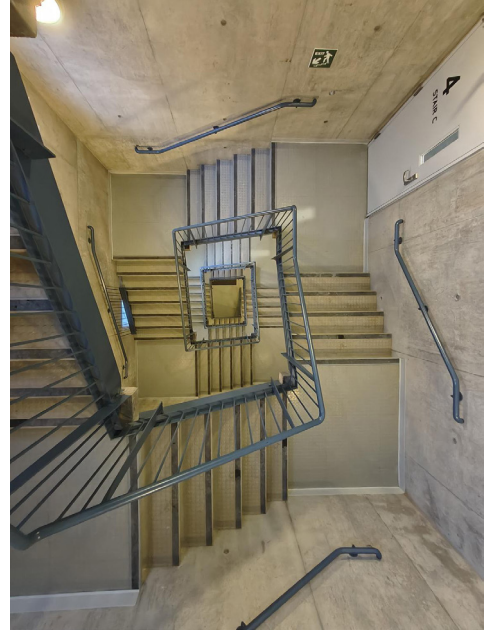
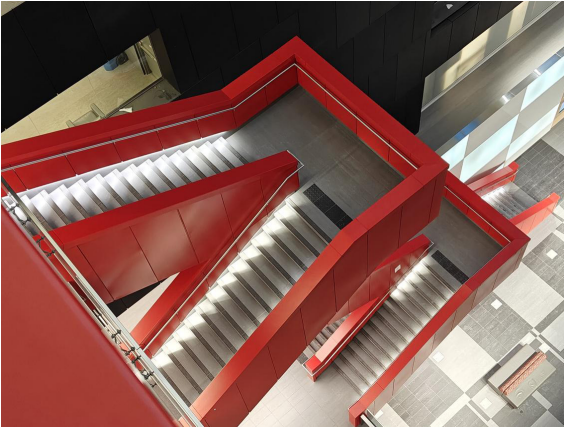
**Seriously, we are looking for new editors. Tell Hammer to apply by emailing [mathnews@gmail.com](mailto:mathnews@gmail.com).**

**A mathNEWS EDITOR WHO IS ABOUT TO GRADUATE**



# CAMPUS STAIRS GEOGUESSR

Happy... wait, tomorrow's March? Anyway, welcome back to the third installment of campus geoguessr! It's all about staircases — no I'm not running out of ideas just saving the best for later :0 Oh, and before I forget, the previous (157.1) solutions are MC, E3, CPH, PHY, ESC, ML, PAS, & SCH from top to bottom. Have a try at these now! And as always, see online for colour.



Whole Number Haver

yes i tried to edit out my reflection in the last photo i know it looks weird

# WHAT IS TYPE THEORY?

What lies at the foundations of mathematics?

Complex numbers are pairs from real numbers. Real numbers are often implemented as Cauchy sequences of rational numbers. Rational numbers are equivalence classes of pairs of integers. Et cetera.

But what lies at the very bottom? What is a sequence, or a pair, or a natural number?

Ultimately, it doesn't really matter. Pairs are a well-understood abstraction, with a clearly defined API. We basically do the equivalent of `import pair`, and get on with our lives. But if we care to look behind that `import`, we have reached the subject of *foundations of mathematics*.

If you ask a mathematician about foundations, they'll direct you to ZFC.

In ZFC, there is only one type of thing: the set. For any two things, you can ask whether one of them is an element of the other. (Is the Sierpiński topological space a subset of the function  $(+1) : \mathbb{N} \rightarrow \mathbb{N}$ ? Weird question to ask, but yes, it is.)

So, there's one type of thing (the set), one relation on things ( $\in$ ), and a couple of axioms. That's it! Simple, right?

Not so fast. Hiding behind this whole setup is an `import logic`. Before you even start on the specifics of ZFC, you need to already understand propositions, and conjunction and disjunction, and implication, and quantifiers, and equality.

But don't we need that? What's the alternative?

Recently (I think), there has been a rise in *proof assistants*—programming languages for writing proofs, where the compiler checks that the proof is correct. These proof assistants typically are *not* built on ZFC. Instead, they use something called *dependent type theory*.

Unlike ZFC, type theory directly builds in constructs like pairs, functions, and even the natural numbers. If you try to ask a question like “Is two an element of three?” it isn't true or false; it's just not a valid question. If you're a programmer, you might say the question “doesn't typecheck.”

So far, this is a lot more complicated than ZFC. But it pays for this complexity with a different simplification.

In ZFC, logic is a built-in concept. In type theory, it isn't. Instead, we define a proposition to be a set with at most one element. True if the set has an element; false if it doesn't.

Now we get logic for free. The conjunction  $P \wedge Q$  is just  $P \times Q$ . Implication is just the set of functions. Even a universal quantifier,  $\forall x : X, P(x)$ , is just the set of functions that take elements  $x \in X$  to elements of  $P(x)$ . Disjunction

and existentials are similar, but end up requiring a quotient to satisfy the “at most one element” rule.

So that's the philosophy. While ZFC starts with logic, and adds untyped sets on top, type theory starts with higher-level typed constructs, and reuses them to build logic from scratch.

But there's something interesting you can only see from the type theory side.

Say we have  $x_1, x_2 : X$ . We need a way to express the proposition  $x_1 = x_2$ . Sure enough, this is another of those builtin constructions.

But must it be a *proposition*? Must the type  $x_1 = x_2$  have only one element? You'd think so... but the default axioms don't require it. You could add one, of course, but it might be better not to.

Why? Consider equations of *sets*. Is the set  $\{0, 1\}$  equal to the set  $\{\text{True}, \text{False}\}$ ?

You could say no. You could say yes. Or, and this is my favorite, you could say “yes, in two ways.” One equating 0 with True and 1 with False, and the other doing the reverse.

That is, we're saying that the type  $\{0, 1\} = \{\text{True}, \text{False}\}$  has two elements. More generally, two  $n$ -element sets are equal to each other in  $n!$  ways!

This is the idea behind *homotopy type theory*, and it has a lot of convenient consequences. For instance, if  $R_1$  and  $R_2$  are rings,  $R_1 = R_2$  has one element for each ring isomorphism between them. Similarly for groups, or any other algebraic structure.

There are the new insights. For any type  $X$  and any  $x : X$ , the type  $x = x$  is a group. And every group can be obtained this way.. So we get a new perspective on group theory.

If you'd like to learn about homotopy type theory for real, here are two books on the subject. The first is the one I used; the second came out more recently than that.

- <https://homotopytypetheory.org/book/>
- <https://arxiv.org/abs/2212.11082>

*finegeometer*

**I have never in my life  
seen the number four.**

PROF. OLIVER PECHENIK

## N HOMES

- Soft foam mats in the basement of my old house. My parents trained me to wipe my butt by using these wet wipes and I flushed them down the toilet in the bathroom adjacent to the main room, eventually clogging the sewage pipes.
- A Minecraft realm owned by a kid I met at a day camp. The world was generated with amplified terrain. I lived in a mountain range on the side of a cliff and I extended a platform out into the air with cobblestone. Upon it laid a small ice farm, my first survival redstone build.
- The window out of the bedroom on the second floor of my grandparents' house, through which the sign of the corner store across the street lit up the opposite wall late into the night.
- By name, the Cartography Club, but in actuality, an excuse to use the projector to play Geoguessr. We tracked our Mini Metro web demo high scores with a spreadsheet, my introduction to conditional formatting.
- A Blåhaj, a tiny nook in the corner of the room, and a set of desks and shelves that became a little too small for me over the years.
- #spam somehow became a break from the anarchy created by the rest of the toxic gamers; maybe it had something to do with messages effectively disappearing mere minutes after being sent.
- The warm tones of these lecture halls effectively countered the imposingly tall ceiling. One did not need to bring Hagoromo for chalk strokes to glide effortlessly across the sliding blackboards.

hyperlynx

## MC IS A BASED AS FUCK HOME

In case you ever find yourself in the position of having 32 consecutive midterms (totally not me) I'd like to recommend living in MC. It will super charge your productivity, and save you time! Shower in M3 (or dont shower at all :3), buy food from C&D, or flock stop, or dont eat!!! (totallyyyy wasntt meeeee) sleep in MC COMfy, or a random room in MC if possible :3

upto yall tbh

it's a vibe just working in MC non stop, esp if u have a friend who also has 96 consecutive mid terams

idk

i'd do it again, remindas me aof hackathons. they are fun a little bit

hehehehe

my finger has a dent the shape of a pen

**I am ending class early  
because I need a burger.**

PROF. BLAKE MADILL





# ADD TITLE

## gridCOMMENT 157.4

bonjour mes amis,

first, an admission of irresponsibility. usually if a **gridWORD** is coming out on the day of, before, or **after some significant event, i like to make it the theme.** i kinda dropped the ball on last one's because it was valentine's day two weeks ago and i made the theme "grad programs at uw math faculty." it's okay though, because i feel like that's far more relatable than the concept of "love" to most **gridWORD**ers anyway

last time, i asked you guys to come up with a **gridQUESTION** to which the answer is "1.5," and you all said:

- *peaclovemath, Lars Nootbaar, and aphf*: What is the percentage chance the Eglinton Crosstown will be completed this year?

- *Cix, χ, Manganese, UW Unprint, and water*: how many hours did it take to do this **gridWORD**?

unfortunately, i believe that there is actually a 0% chance the eglinton crosstown will be completed this year, and so i must award the prize to Cix et al. please pick up your prize at MC 3030!! this **gridQUESTION** this week is: "who did you vote for in the ontario election?" just kidding please don't tell us that. the **ACTUAL gridQUESTION** is: "how would someone differentiate between you and your evil clone?" please email your answer, completed **gridWORD**, and a pseudonym to [mathnews@gmail.com](mailto:mathnews@gmail.com) by march 10, 6 pm (i keep forgetting to include this part in my **gridCOMMENTS**)

good luck on midterms everyone :D

spaghettinhalers

### ACROSS

- Crypto bro purchases
- Toy on a shelf
- Come out
- Iranian money
- Guy's date
- Parents, usually
- With a bow, to Stern
- Frigid
- New Democratic Party member, maybe?\*
- Pin holders
- What the tortoise did to the hare
- Order
- Let go
- Over there
- Regions under an archbishop?
- \_\_\_ chi
- Anger
- Guys' dates
- Full of shifting colors and patterns
- Author Bagnold
- By means of
- When doubled, a dance
- Skilled metalworkers, maybe?
- Lawn base
- Desperate
- Spoilers
- Liberal party member, maybe?\*
- Anjouan village
- Western gully
- First prime
- Pinned up
- Rock-clinging mollusk
- Inverting logic gate
- Can be found by integrating a curve
- Judge
- Golf ball prop
- Certain Slav

### DOWN

- Gun grp.
- Northwest Territories lake
- Damage-taker in a game of Teamfight Tactics
- Laggard
- Sponsorship
- Fond du \_\_\_
- Wing it?
- Happens next
- Damon of "Good Will Hunting"
- Dubai dignitary
- Track event
- \_\_\_-Roman
- City near Düsseldorf
- \_\_\_ be a real shame if...
- Kind of deposit
- Slay, colloquially
- Progressive Conservative Party member, maybe?\*
- Freeze up
- Calc \_\_\_ (MATH 237)
- It may be stroked
- Syrup precursor
- Official permission of practice
- Green Party member, maybe?\*
- Ad \_\_\_
- Old Tokyo
- Father
- Mitchell Pritchett's partner
- Bum
- Eggheads
- Make stuff up
- Lawyers' org.
- Buckwheat grains
- Milan's La \_\_\_
- Gold braid
- Students' buildings
- Sulk
- Parting words
- Yesterday's (February 27, 2025) activity for many Ontarians involving the starred clues\*
- Discharge letters?
- Misery
- Yap

1	2	3	4		5	6	7		8	9	10	11	12	13
14					15				16					
17					18				19					
	20			21				22						
23					24	25					26			
27					28				29	30				
31					32				33		34	35		
	36		37	38				39	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			
67						68					69			

The exam is over, you can stop guessing.

PROF. JERRY WANG



# lookAHEAD

SUN MAR 2	MON MAR 3	TUE MAR 4	WED MAR 5	THU MAR 6	FRI MAR 7	SAT MAR 8
Valentine's Day 3 Pi Day (Indiana)	1 Day		Go the Wrong Way on the Bus Day	Co-op cycle 2 rankings available	SASMS (day 1) Co-op cycle 2 rankings due	SASMS (day 2) Math Grad Ball Co-op continuous period begins
SUN MAR 9	MON MAR 10	TUE MAR 11	WED MAR 12	THU MAR 13	FRI MAR 14	SAT MAR 15
Daylight Savings Time begins	mathNEWS 157.5 production night 6:30 PM, PHY 145	Mario Duplication Day	Draw Something Funny with Mathematical Symbols in LaTeX Day		mathNEWS 157.5 (approx. 50.134 $\pi$ ) released Pi Day	

## KICAD APPRECIATION POST

Over the course of an electrical/computer engineering degree, you get exposed to a huge variety of software. It's all very useful: designing electronics is complex, heavily involved work, and the many programs we have at our disposal are incredibly helpful for taking some of the load off—which makes the vast number of annoyances they all seem to have all the more frustrating.

Take LTSpice, one of the first such programs I encountered, when I was taking first-year circuits during COVID. It's used for simulating circuits. It also feels like it was designed by aliens who have never seen a normal piece of software before: every mouse click does something you wouldn't expect. The keyboard shortcut for Undo? F9, of course. Or Intel Quartus Prime (for simulating HDL designs), which crashes just as often as you would expect for a program called Intel Quartus Prime. Or Vivado (also for simulating HDL designs), or Cadence Virtuoso (for designing transistor layouts of ICs), or an uncountable number of other frustrations.

KiCad, an open-source schematic and PCB design tool, is refreshingly different. It's hard to describe exactly *how*, because it just feels like a normal program in a way that almost no other ECE tool achieves. It wins by being boring and predictable. Undo is Ctrl-Z, clicking something selects it, the parts library probably has the part you're looking for, and if you find a five-year-old tutorial, its instructions probably apply to the version of the program you're using now too.

Most people don't usually take the time to appreciate something's normalcy, but I think it's warranted here. Thanks, KiCad.

\_\_init\_\_

*math* NEWS

## LAST ISSUE'S gridSOLUTION

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