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"WHICH ITEMS ON CAMPUS DO YOU SUSPECT ARE SECRETLY SPYING ON YOU?"

Happy early reading week, my loveliest readers!

What a week, huh? ~~Aphrodite's~~ Valentine's Day, WUSA ~~MacBook giveaway~~ elections, the whole "~~Big Brother~~ Massive M&M is Watching" scandal… and some of you even have midterms. *shudders*

Speaking of the M&M thing, **mathNEWS** writer molasses, who has been on a spree of Actual Journalism lately, has a fantastic article on page 4 that you should check out. It's a great overview of what those machines are (probably) up to and the various amounts of illegal and bad for your privacy they may or may not be. Chef's kiss, no notes.

There's also other fantastic stuff in this issue, like:

- an enlightening overview as to why stocks cause inflation,
- a continuation of the cult-classic H◐◑ters article series,
- a love letter to a lost-to-time browser game about a UNIX command,
- the secret to ximilu,
- a review of the newest FASS musical,
- a middle-of-the-page **blackBOX**,

and much more. You're definitely gonna be reading a lot of great stuff next week, that's for sure.

Now, by this point in the **mastHEAD**, I normally have to wrap up my ramblings so we can fit the Article of the Issue text beneath it. But as you can see over there →, we had so few answers to our **mastHEAD** question that the Article of the Issue text fits beneath them to the right! On the one hand, I'm happy that I can ramble more. On the other hand, I really miss the writers… 🥺 I hope they come back from the midterms soon…

Also, what the fuck is a greedoid?

caffeinatED
Editor, **mathNEWS**

RapidEyeMovement	awED
terminal	the PMC light sensor
yummyPi	The geese, for sure. Something about their beady eyes doesn't sit right with me.
Sexy_Software_Babe	definitely not the M&M vending machines
bsgcg	RapidEyeMovement
cutlet	CnD chili, I hope
jeff	the jerma bust in the **mathNEWS** office…
__init__	The **black box** outside the Math CnD
andoiii	those darn double degree students… or the bird
molasses	probably the wifi routers and also the wusa sushi
tendstofortytwo	the trash cans judge all of us on how well we sort our trash
Lars Nootbaar	The damn security cameras are watching me
Not a N*rd	The cameras.
Dick Smithers	The SLC Tim's Rats
boldblazer	*cue Among Us Drip Theme Song* haha sus
APHF	everyone around me is spying on me and judging me for wearing the same shirt twice in a row
awED	RapidEyeMovement's looking real sus lately
distractED	Egg fountain
caffeinatED	Every other Thursday night I feel a reader-shaped stare following me around campus expecting me to put **mathNEWS** issues on stands
befuddlED	The pictures of the faculty founders in front of the Math CnD
evaluatED	This **mathNEWS** issue. That's right — we've embedded secret cameras into each issue as a pilot program. Try to find the one in yours!

ARTICLE OF THE ISSUE

Aaaaaand in a rare DOUBLE AOTI moment, the writer molasses is back to put the NEWS in **mathNEWS** in the M&M's machines are watching you! Great job. You know what to do.

awED
Editor, **mathNEWS**

This issue also contains lead for added freshness. Be careful not to damage it!

math**ASKS** 154.3
FEATURING PROFESSOR SHANE BAUMAN

WHOLE NUMBER HAVER: OPINIONS ON MTHEL 99?

I may be biased since I helped create it, but I believe that MTHEL 99 is a great refresher course for first-year students who will be taking a math course at UW. I think it helps students zero in on areas that they need to review. Unfortunately, many students who need the review don't take the time to make the most of it.

BUBERT: WHAT'S A NORMAL BREAKFAST LOOK LIKE?

I'm a creature of habit so I usually have between 70 and 80 grams of cottage cheese, between 12 and 20 grapes and half a tablespoon of sunflower seeds. (You can see I like to measure!)

FIRSTIE: WHAT WOULD YOU TELL YOURSELF IF YOU COULD ASK YOURSELF "WHAT WOULD YOU TELL YOURSELF IF YOU COULD ASK YOURSELF?"?

I think the recursion here is broken. But then again, my CS skills aren't always the best.

A SLICE OF PIAZZA, HOLD THE CHEESE: HOW DID YOU COME UP WITH SO MANY GREAT LIFE ADVICE POSTS TO POST ON PIAZZA BACK IN 2020? (THANK YOU BTW!!)

Most of the advice came from JP Pretti, who was the coordinator of MATH 135 for a few years. He wrote a lot of the original posts. I took on the role of sharing these posts and I have edited them and added my own thoughts to them over the years.

CULTURED UNDERGRAD MATH COURSES ENJOYER: 135 OR 136?

I like MATH 135 more. It's so much fun to be there at the start of a student's university career and play a role in shaping the way they think about mathematics.

YALEVOYLIAN: PANCAKES OR WAFFLES?

Either, but you must eat them with real maple syrup.

NOT_A_UW_STUDENT_(YET): ANY TIPS FOR SELF-STUDYING MATH?

There are a lot of great resources out there. I think the best way to learn math is by doing math, so whatever resource you choose, make sure it includes problems for you to try and wrestle with.

NOT_A_UW_STUDENT_(YET): HOW DO YOU GET GOOD AT MATH?

Practice, practice, practice! If you ever watch any of my YouTube videos, I always finish with the tag line "keep on practicing" because as I said above, the best way to get better at math is to do math. Solve problems and discuss those solutions with other people. Explaining a concept helps you to learn it at a deeper level.

BE'F UNWELLINGTON : WHAT'S THE BEST WAY FOR AN UNDERGRAD PASSIONATE ABOUT MATH EDUCATION TO GET INVOLVED WITH CEMC?

Apply to be one of our Fall or Winter co-op students. These co-op students run our grade 6–8 Math Circles program, and that means you have the opportunity to teach some keen elementary students about some fun mathematics.

DOLLAR STORE PERSON: ANY ADVICE FOR ASPIRING LGBTQ+ MATHEMATICIANS?

As a gay man I try my best to live authentically. I try to be open about my life as a way of paving the way for other queer people and to challenge people's stereotypes. I understand that I have a lot of privilege as a white, cis, able-bodied male and that makes it easier for me. I encourage you to find as many spaces as you can where you can be your whole self. I hope those spaces will include part, if not all, of your academic life. I also try to not let any one aspect of my life define the rest of my life. My sexuality is only a part of me. Similarly, my work as a math educator is only a part of me.

MOBPSYCHOFAN: WHAT MATHEMATICIAN'S NAME IS THE WORST TO PRONOUNCE?

Probably the one that I've been mispronouncing all these years and I still don't know that I'm mispronouncing it.

JEFF: WHAT'S YOUR FAVOURITE BATHROOM ON CAMPUS?

I use whatever bathroom is closest. But I know the one on the first floor of DC smells the worst. I also dislike blow-dryers and prefer paper towels, so I try to find one with paper towels.

PEACELOVEMATH: DO YOU HAVE ANY ADVICE FOR UNDERGRADS FACING THE IMPENDING DOOM OF GRADUATING SOON?

Be willing to try something. Your first job is very unlikely to be end up being your career. And don't let your job define who you are. A job is only part of your life. Don't focus on it at the expense of everything else.

ALYSSNYA/BOLDBLAZER: WHERE'D YOU GET THAT RAINBOW MONKEY HAT?

It actually belongs to my husband. He got it from the St. Lawrence Market in Toronto.

EVALUATED: LEAST FAVOURITE COURSE DURING YOUR UNDERGRAD?

STAT 231. I don't know what it's like now, but I found it to be very subjective, and yet it was marked with only one correct answer, which I found frustrating.

DOLLAR STORE PERSON: WHAT'S YOUR GO-TO PIZZA ORDER (EXCLUDING TO-MATRIX SAUCE AND EIGENPLANTS)?

My husband and I love Pepi's pizza. We always get one with bruschetta tomatoes, Italian sausage, and feta cheese.

MOLASSES: HOW DO YOU MAKE FRIENDS ONCE YOU'RE AN ADULT, OUT OF THE UNIVERSITY LIFE?

Most of my adult friends I have made through social groups like church and queer groups. I have also made friends through the board game community. Find things that you love to do and pursue those things. Along the way you will meet others who share your interests and those are great potentials for new friends.

DOLLAR STORE PERSON: WHAT MOTIVATES YOU AS A LECTURER?

I have always loved problem-solving and helping people. Teaching puts those two things together. I love seeing when students have an "aha" moment and things click for them, and they solve a problem by themselves.

LEAH: DO YOU LIKE STAR WARS? IF SO, WHAT IS YOUR FAVOURITE STAR WARS MOVIE?

Sorry, not really a Star Wars fan. I was more into Star Trek when I was younger, though I haven't kept up with all the spin-off series.

profTHOUGHTS 154.3
PUZZLES, PUZZLES, PUZZLES!

Problem solving comes in many forms. As students of the Faculty of Mathematics, I'm sure that many of you love solving mathematical problems or problems that can be solved using coding. I want to talk about a different type of problem solving that I'll refer to as puzzle solving. Being a mathematician, I probably should have a precise definition of what a puzzle is and how to clearly identify what puzzle solving is, but I don't. I just know that puzzle solving is fun!

One of the areas where I get to do puzzle solving is escape rooms. I was originally introduced to them at Adventure Rooms (`adventurerooms.ca`) My family has completed all their rooms a long time ago and we enjoyed all of them. We were escape room newbies back then so I wonder if we would enjoy them as much if we did one of them now. Lately, we've been working our way through all the rooms at KW Escape (`kwescape.ca`). They have a lot of rooms! I think my favourite

that we have done so far is Twister, which has an entire house trailer inside the room! My favourite escape room of all time is the room at the old post office in Harriston (`https://theoldpost.ca/escape-the-old-post/`). It's so large that you are given 90 minutes to escape rather than the usual 60 minutes. It took my family two tries to make it all the way through and I was amazed at the way the space kept opening up more and more and more. They started building a second room before the pandemic and we have been eagerly awaiting its opening.

If you don't have the mobility to visit actual escape rooms, there are a lot of great escape room apps. Because you are looking for clues as you navigate through these games, I recommend playing these games on a tablet with a large screen. My first introduction to escape room apps was the Forever Lost trilogy created by Glitch Games (`glitch.games`). They are super quirky with lots of bad jokes, but I found them to be a lot of fun. A similar set of quirky and rather dark puzzles are the Rusty Lake games (`rustylake.com`). There are a lot of them and there is a wacky story that weaves its way through them. If you are looking for some very beautiful games with more intricate puzzles, then I recommend the Room series (`https://www.fireproofgames.com/games/the-room`) and the House of DaVinci series (`https://www.bluebraingames.com`). I will point out that one downside to escape room apps is that they can devolve into an annoying amount of tapping as you tap on every object on every screen hoping to reveal a new item that you need.

If you want a free in-person puzzling experience, I recommend Puzzled Pint (`puzzledpint.com`) It takes place on the second Tuesday of every month at some restaurant in the Waterloo region. To figure out which restaurant, you need to solve each month's location puzzle which is posted online. At the event you will be given four puzzles. The answers to these puzzles are used to solve the meta puzzle. If you manage to solve that, then there is also a bonus puzzle. My husband and I usually complete all six puzzles in about 90 minutes. If you miss a month, you can try the puzzles in their online archive.

I'd be remiss to write about puzzle solving and not mention UW Math's own Key Clues (`https://uwaterloo.ca/math/key-clues`)! This past fall I was part of a team that solved all the puzzles, and it was amazing! Unfortunately, we must wait until Winter 2025 for the next Key Clues event, but I totally recommend putting a team together to solve this series of challenging puzzles that lead you to a secret location on campus. So much fun!

I could also write about escape room board games, Games Magazine and other sources of puzzles, but those topics are left for discovery by the reader. If you have other puzzle opportunities, I'd love to know.

Prof. Shane Bauman

DO STOCKS CAUSE INFLATION? I WENT TO THE UW STOCKS CLUB TO FIND OUT

Look, plenty of people spend their days dunking on the various pseudoscientific theories of the Internet, and I get that it's fun, but you all have to realize that the pseudoscience people are having fun too. Like, a lot of fun. Think of flat-earthers performing experiments, or astrologists rigorously analyzing signs, or sovereign citizens creatively interpreting laws. I'm not saying these are equal in their harmfulness or anything! Don't get mad at me! I just think they all sort of scratch the same itch. In a world where everyone seems to know more than you, you get to pretend you have it all figured out. You get to play an ancient Greek philosopher and discover basic facts about how the world works without having fifty PhDs or whatever. I feel like I'm missing out.

That's why, a while ago, I came up with my own pseudoscientific theory: stocks cause inflation. I mean, inflation is people losing money by doing nothing, and stocks are people gaining money by doing nothing, right? Seems to me like the inflation money is going to the stocks people. Since I've never studied economics or finance in any capacity, and haven't so much as watched a YouTube video on the subject, I feel perfectly qualified to wholeheartedly believe in this theory. I wouldn't want to be influenced by any actual economics or anything. I don't know enough about economics to know which parts are real science and which are bogus science, so it's probably simpler to just avoid the entire field altogether.

But eventually I got sick of keeping this theory to myself. When you have a revelation, you tell people about it, right? You get to feel smug about the fact that you know more than everyone else. And so far I had only discussed this theory with similarly non-economist friends, and my parents, who would respond by looking at me like I was an idiot. I needed actual experts to discuss my ideas with. So I paid a visit to the top source of economic intellect on campus: the University of Waterloo Stocks Club.

When I walked in, I knew I was in the right place. The room on the second floor of United College was clean and professional, walls adorned with wood accents; the slideshow at the front of the room was not done in PowerPoint, nor Google Slides: no, it was made in Canva. Audience members were scrolling through stock-graphs on their MacBooks. This surely was a meeting of economists.

The meeting had already started: one presenter was going over savings accounts, then passed it off to another presenter who began discussing dividends. Dividends, apparently, are when a company wants more investors for some reason but doesn't want to grow so they just give their investors money. I couldn't get a clear answer on why the hell this made any sense. More confusion arose when it was mentioned that the stock market closes at 4pm, because it apparently relies on human operators called "brokers" who need to go home.

Clearly, I was missing some of the basics. I raised my hand. "What is a stock?" I asked. They laughed, then told me they had explained that last week, but they would go over it again next week. Okay, maybe I'll ask a less intense question. I settled for "why do stocks have value?" The answer boiled down to "because people think they have value (because they think they can sell them for more later)" and this was "just like everything else", which is clearly not true if you are someone who has ever bought something for the purpose of anything but selling it later. But I was new to all this. Maybe, unbeknownst to me, economists simply do not eat. I'd have to come back the next week to learn more.

As promised, next week's presentation started with an explanation of what a stock is. A stock is "part ownership in a company." Huh? Well, a company has sets of objects called "assets" and "debt", and when you subtract the debt from the assets you get the "owner's equity." What does it mean to subtract objects from objects? The debt is a subset of the assets, so it works out. So if I own 20% of the company and the owner's equity consists of a car can I cut off 20% of the car and take it? The answer was "we're just gonna finish this presentation and then we can answer all of your questions."

Great. They're already getting sick of me and I still don't have any further information on stocks causing inflation. After the presentation, I decided to get to the point. Why does the stock market go up? Because more value is always getting created. So why is everyone losing money instead of gaining money? Well, that would be deflation, and deflation is BAD. Deflation would HURT the economy. They seemed to be very upset about this.

"Do stocks cause inflation?" I finally asked. No, they assured me, inflation is exclusively caused by the government printing money. Why don't they stop doing that? Well, inflation is actually good for the economy. Why? It encourages people to spend more. Apparently if there was no inflation, everyone would hoard all of their money and never buy anything. The stocks people are, once again, assuming nobody eats. Why is it good when people spend more? Because it's good for the economy.

A rational person might assume these people are simply ignoring the real world, blindly optimizing all of their decisions in pursuit of an arbitrary set of goals known as "the economy." I think they're smarter than that, though. I think they're up to something. I think they've purposefully hidden how the entire world works behind so many layers of abstraction that nobody can tell that stocks are causing inflation. Everyone is losing money so that the stock marketers can gain money. My theory has turned into a conspiracy theory. I left feeling vindicated.

__init__

THE M&M'S MACHINES ARE WATCHING YOU

In **mathNEWS** 154.2, *Lars Nootbar* wrote of Tucker Carlson's obsessive hatred of modern day M&M's. The article was excellent, but surely, Tucker Carlson's rants about M&M's being a symbol of the downfall of freedom are entirely unfounded, right?

No. The M&M's machines are watching you.

On Saturday February 10th at 8:16 PM, r/uwaterloo user u/SquidKid47 posted a picture of a strange error message found upon one of the ubiquitous canary yellow M&M's machines:[1]

```
Invenda.Vending.FacialRecognitionApp.exe
            Application Error
```

WHO ARE THE COMPANIES INVOLVED AND WHAT DO THEY WANT WITH YOUR FACE?

Let's take a few steps back. What *exactly* are these vending machines doing, and who is responsible? **mathNEWS** investigative journalist *firstie* contacted Plant Ops, who claim zero involvement with the vending machines. This leaves operational responsibility with the company operating the machines: Adaria Vending Services.

Adaria does not make the machines; *firstie* determined the machines' original manufacturer to be Invenda Group, an organization boasting intelligent vending machines with data collection capabilities.[2] Some data collected is benign, including sales and UI performance metrics. But Adaria can also use these machines to collect further data, sending it to relevant parties including Mars, the manufacturer of M&M's. In particular, Invenda's sales brochures state the machines are capable of sending estimated ages and genders of every client.

This sounds familiar.

CADILLAC FAIRVIEW'S DEMOGRAPHIC DATA COLLECTION AFFAIR

Six years ago, Cadillac Fairview (CF)[3], owner of landmark shopping malls across Canada, became mired in controversy when the CBC discovered them to be using facial recognition software on unsuspecting patrons. Across eight weeks, they collected data on 5,061,324 patrons using secret cameras hidden within their malls' informational kiosks.[4]

Sound familiar?

In the privacy commissioner of Canada's subsequent investigation, it was revealed that Cadillac Fairview used the kiosks' facial recognition capabilities for similar goals as Invenda machines enable: demographic data collection on users' ages and genders.[4]

Facial recognition software isn't inherently malicious. Many use Apple's Face ID every day. The key is that in such situations, the individual provides *express, meaningful consent.*

When personally-identifiable biometric data is used without express, meaningful consent, it often constitutes a privacy violation.

A RESPONSE FROM ADARIA VENDING SERVICES

We could not responsibly publish this article without providing Adaria Vending Services the chance to respond. Below is their Director of Technology Services' unedited response.

> *What's most important to understand is that the machines do not take or store any photos or images, and an individual person cannot be identified using the technology in the machines. The technology acts as a motion sensor that detects faces, so the machine knows when to activate the purchasing interface — never taking or storing images of customers. In partnership with Mars and Invenda, these machines are fully GDPR compliant and are in use in many facilities across North America.*

> *At the University of Waterloo, Adaria manages last mile fulfillment services — we handle restocking and logistics for the snack vending machines. Adaria does not collect any data about its users and does not have any access to identify users of these M&M vending machines.*

Although Adaria may not personally collect data from the machines, that does not prevent Invenda from collecting demographic information. Neither does it prevent Invenda from sending this information to M&M's manufacturer Mars.

A CONTRADICTORY RESPONSE FROM INVENDA

Two hours before the **mathNEWS** publication deadline, we received the following response from Invenda's Founder and Executive Chairman:

> *As the producer of the Invenda IoT solution, the Invenda smart vending machine, and its associated software, we formally warrant that the demographic detection software integrated into the smart vending machine operates entirely locally. It does not engage in storage, communication, or transmission of any imagery or personally identifiable information. The software conducts local processing of digital image maps derived from the USB optical sensor in real-time, without storing such data on permanent memory mediums or transmitting it over the Internet to the Cloud.*

They go on to say,

> *It is imperative to note that the Invenda Software does not possess the capability to recognize any individual's identity or any other form of personal information.*

> *Further, Invenda's smart vending machines and its software are compliant with General Data Protection Regulation and equivalent data privacy policies.*

On an attached FAQ sheet, they also state that "only the final data, namely presence of person, estimated age and estimated gender, is collected without any association with an individual." The document continues,

> **FAQ:** *Do Invenda clients exclusively obtain anonymized analytical outcomes, such as usage frequency within specific demographic trends, sales statistics, etc.?*

> **Answer:** *Clients are furnished with anonymized data analyses.*

While Adaria claims the machines take no images of customers, and has no demographic imaging capabilties, Invenda contradicts them in saying they do—however, relevant data is only used locally.

In the Cadillac Fairview investigation, CF initially claimed their system did not store facial recognition data. Only through the investigation was it discovered that CF's vendor kept a database containing facial embeddings of over five million nonconsenting Canadians.

Caution is warranted.

THE ARGUMENT FOR EXPRESS, MEANINGFUL CONSENT

Cadillac Fairview could have avoided controversy had their kiosks informed users facial recognition was in use. They did not.

In the privacy commissioner's report, the commissioner emphasized that "shoppers had no reason to expect their image was being collected by an inconspicuous camera, or that it would be used, with facial recognition technology, for analysis."[6] No one expected the M&M's machines to have cameras. The commissioner further decried "the lack of meaningful consent."[6] No student consented to the cameras. Most relevant was the following:

> *If Cadillac Fairview were to use such technology in the future, it should take steps to obtain express, meaningful consent, before capturing and analyzing the biometric facial images of shoppers.*[6]

Express, meaningful consent means two things. One, that the individual understands the full context of what they consent to. Two, that the consent is *express*—it is not implied, but rather openly given by the individual.

Adaria's Invenda M&M's machines fail both counts.

On campus today, Adaria's machines can conduct the privacy violations Cadillac Fairview ran afoul of. With almost imperceptible cameras, they identify biometric information of M&M's shoppers without our permission. Never in the user interaction flow are we asked "do you consent to having your biometric data scanned?", because ideally, *we shouldn't have known we are being scanned at all.*

When Cadillac Fairview was caught using such practices, it was national news and warranted a privacy commissioner investigation. What will happen to Adaria, Invenda, and Mars?

WHAT CAN YOU DO?

When the investigation concluded, Cadillac Fairview agreed to delete all information it had gained from the program. That was the limit of their punishment. Although the Personal Information Protection and Electronic Documents Act (PIPEDA) provides the ability to enforce fines on lawbreakers, no such measures were taken.[4] Canada shook its stick, and warned CF that should they try again, we will shake our stick even more firmly.

We are not so powerless. The University of Waterloo is an institution within which you have power. University administration often sounds deaf to our wants, but often, it is because there are needs they must counterbalance to our demands.

No one needs M&M's cameras.

Students can ask that University administration bar facial recognition vending machines from campus. Adaria's Invenda machines can secretly read students' biometric data without our consent. With no consent, the M&M's machines' facial recognition follows in the footsteps of historical open violations of Canadian privacy law.

molasses

1. https://www.reddit.com/r/uwaterloo/comments/1anvv0q/hey_so_why_do_the_stupid_mm_machines_have_facial/
2. https://www.invendagroup.com/vending-machines
3. Owned entirely by the Ontario Teachers' Pension Plan. I hope one day we find the Ontario Teachers' Pension Plan has bought the entirety of Ohio.
4. https://www.cbc.ca/news/politics/cadillac-fairview-5-million-images-1.5781735
5. The GDPR is EU privacy legislation. Invenda is a Swiss company, hence, their machines focus on EU privacy law.
6. https://www.priv.gc.ca/en/opc-news/news-and-announcements/2020/nr-c_201029/

PERSONALITY QUIZ

Answer the following questions to discover which greedoid best matches your personality!

WHEN IT COMES TO DECISION-MAKING, WHICH BEST DESCRIBES YOU?

1. I prefer to rely on logical reasoning and mathematical principles, much like the precision Gauss applied in his mathematical work.
2. I value tradition and social norms.
3. I believe in fair exchanges and mutual benefits.
4. I tend to analyze situations from multiple perspectives.
5. I like to manipulate situations to my advantage, using cunning and deceit when necessary.
6. I approach problems by eliminating the least desirable options.

HOW DO YOU APPROACH RELATIONSHIPS?

1. I seek stability and long-term commitments, similar to Gauss's dedication to his scientific pursuits.
2. I prioritize mutual respect and honor in relationships.
3. I believe in fair and equal partnerships.
4. I enjoy exploring different dynamics and perspectives in relationships.
5. I exploit relationships for personal gain, often manipulating others to achieve my goals.
6. I prefer straightforward interactions and clarity in relationships.

WHAT MOTIVATES YOU IN LIFE?

1. Achieving perfection and accuracy, akin to Gauss's pursuit of mathematical precision.
2. Upholding traditions and cultural values.
3. Fairness and justice for all.
4. Exploring complexity and pushing boundaries.
5. Gaining power and control over others, using any means necessary.
6. Efficiency and optimization.

HOW DO YOU HANDLE CONFLICTS?

1. By applying rigorous logical reasoning and evidence-based approaches, mirroring Gauss's methodical problem-solving in mathematics.
2. By seeking guidance from established norms and customs.
3. By finding compromises that benefit everyone involved.
4. By considering multiple perspectives and seeking common ground.
5. By manipulating situations to come out on top, regardless of the consequences for others.
6. By systematically eliminating sources of conflict.

WHAT TYPE OF CHALLENGES DO YOU FIND MOST INTRIGUING?

1. Analytical puzzles and mathematical problems, much like Gauss's lifelong dedication to unraveling the mysteries of mathematics through analytical reasoning and problem-solving.
2. Historical or cultural mysteries.
3. Ethical dilemmas and social justice issues.
4. Complex systems and dynamic environments.
5. Scheming and outsmarting others to achieve personal gain.
6. Optimization problems and efficiency improvements.

HOW DO YOU PREFER TO APPROACH YOUR TASKS OR PROJECTS?

1. By meticulously devising systematic plans rooted in precise calculations, akin to Gauss's approach to organizing his mathematical inquiries.
2. By adhering to established procedures and protocols.
3. By ensuring fairness and equity in distribution of tasks.
4. By adapting to changing circumstances and embracing flexibility.
5. By manipulating situations and people to achieve my objectives.
6. By prioritizing tasks and eliminating unnecessary steps.

WHAT ROLE DO RULES PLAY IN YOUR LIFE?

1. Rules serve as guiding principles, aiding in structured decision-making and logical deductions, much like Gauss's reliance on mathematical principles to navigate complex problems.
2. Rules help preserve tradition and order in society.
3. Rules should be fair and just for everyone involved.
4. Rules can be flexible depending on the context.
5. Rules are meant to be bent or broken if it serves my interests.
6. Rules serve as a framework for efficiency and optimization.

WHICH WORD BEST DESCRIBES YOUR APPROACH TO PROBLEM-SOLVING?

1. Logical, similar to Gauss's analytical approach to mathematical challenges.
2. Traditional
3. Equitable
4. Adaptive
5. Manipulative
6. Systematic

WHAT DO YOU VALUE MOST IN A TEAM OR GROUP SETTING?

1. Precision and accuracy in execution, echoing Gauss's emphasis on accuracy and meticulousness in collaborative endeavors.
2. Harmony and respect for hierarchy.
3. Fairness and equal participation.
4. Diversity of perspectives and adaptability.
5. Loyalty and obedience to my directives.
6. Efficiency and streamlined processes.

HOW DO YOU ENVISION SUCCESS?

1. Achieving unparalleled precision and mastery in my field, striving for excellence with every endeavor, echoing Gauss's pursuit of mathematical perfection and mastery.
2. Upholding traditions and leaving a lasting legacy.
3. Creating positive impact and fostering equality.
4. Constantly evolving and embracing change.
5. Dominating others and ensuring my own supremacy.
6. Optimizing processes and maximizing outcomes.

RESULTS:

- **Mostly 1's:** You are a Gauss Greedoid!
- **Mostly 2's:** You are a Medieval Marriage Greedoid!
- **Mostly 3's:** You are an Exchange System!
- **Mostly 4's:** You are an Ear-Decomposition Greedoid!
- **Mostly 5's:** You are a Twisted Matroid!
- **Mostly 6's:** You are a Bisimplicial Elimination Greedoid!

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MnO4
</div>

sorry editors, i don't know why it doesn't want to format :(*[Editor's note: don't worry, we can't tell what's wrong.]*

IMPLEMENTABLE DISEMBODIMENT

A POEM USING ONLY ENTRIES THAT ARE BEING ADDED AS NEW LEGAL SCRABBLE WORDS

hyperlocal disfiguration

bodysnatching policymaker

overburdensome inescapability

synthetical fictionalizer

transmasculine, compartmentally

<div align="right">

normalparameters
</div>

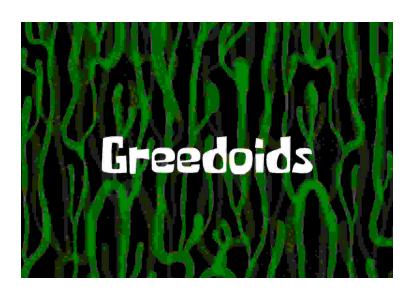# THE NEXT GREAT CANADIAN NOVEL IN WAITING

Okay, so, possibly technically yes I was going to have an actual article for this issue. However, due to the fact that I've decided to take both myself and this joke too seriously, I'm going to need a bit more time to write what any tween on Wattpad can write in ten minutes. And I don't even think I'm going to get a Netflix deal out of it.

So, uh, instead, here are terrible romance trope ideas if anyone else also wants to write Waterloo fanfiction (because this is what the world needs):

- Rivals (interviewing for the same company back when WaterlooWorks actually told us who was interviewing)
- They were room-dorm-mates
- There was only one textbook
- Fake dating (to prove that CS majors can date I swear Ihaveproofitsreal)
- You smell nice (you shower)
- iClicker meet cute
- Rescue from goose
- Interrupted confession (they left class the second the professor stopped talking. Maybe their house is on fire. Yeah that's it)
- Forbidden romance (Eng + CS or Waterloo + Laurier)
- Romantic rival (it's a 2D girl)
- Childhood friend (friend from O-Week you never saw again despite them being in the same major and sequence)

If anyone has any more ideas, either just know who I am in real life and tell me, or publish it in the next **mathNEWS** issue and I'll probably see it.

<div align="right">

Not a N*rd
</div>

SASKAT👀N H👀TERS

I'M A HACK AND A FRAUD BUT I MAKE UP FOR IT

SUPPLICATION

My dearest most darling **mathNEWS** readers. I have a confession to make. Last issue in <u>Canada needs more H👀ters,</u>[1] I erroneously claimed that there were only three H👀ters in Canada. To the dismay and joy of everyone, there are actually two more H👀ters. These two[2] new H👀ters are in Winnipeg and Saskat👀n. When I claimed that they should build a H👀ters in Saskat👀n, I was psychically predicting it. As an apology, I present to you a review of the Saskat👀n H👀ters.

FLYING CLOSE TO THE SUN

We flew in Friday afternoon. Hungry and checked into the hotel, my coworkers and I ventured forth into the great unknown. It was 5 PM and I was starving. We set our sights on a nice restaurant. As we slowly drove along unplowed streets, we passed the glowing sign of H👀ters. I, still shy and not yet sleep deprived, said nothing. But I knew in my heart I would come back soon. We visited the same plaza four times without going to H👀ters.

MEN CREATED FALSE IDOLS TO FEEL CLOSER TO GOD

It was the day of *The BIG Game*. Is there a more perfect occasion to go to this quasi-sports bar than during the Super Bowl? But I needed a mission-critical nap and had to run more samples at the Synchrotron. To make up for such a loss, I used a delivery service to purchase H👀ters' *Tex Mex Nachos*. I thought it'd be a nice amount. Boy howdy was I wrong. When I picked up the order, I was delighted, nay, absolutely treated, to a large metal tray. I returned to the beamline to examine my 10pm nachos dinner and was amazed, even astounded, by what I got. Personally, I find that eating nachos is an exercise in rationing. There are never enough toppings per chip. However, the H👀ters nachos were the opposite. I had more toppings than I knew what to do with. Guac was included. They were absolutely peak, if soggy, nachos. 8/10

EXODUS

It was now Monday morning. We no longer had beamtime. We were free.

Free to go to H👀ters, that is!!

We drove to the promised land, the Saskat👀n H👀ters. I had been waiting for this moment all my life.

The first sight we saw was the merch booth.[3] A taped up sign advertised that we could get our merch signed!

THE HEAVENS AND THE EARTH

Monday at lunch is decidedly not the busiest time to go to H👀ters. Last night, *The BIG Game*, would have been ideal. The Monday crowd was sparse. The sea of empty booths and fake wood tables gave the place a funeral air. Nothing remained from last night's celebration except some sticky spots on the floor and the clinks of waitresses re-organizing the bar.

The H👀ters decor is something to write home about. There were local sports flags hung across the bar and cheeky signs with phrases like "don't touch the wildlife." There were even two custom murals. Suffice it to say I was charmed. Throughout the entire meal, all they played was country music. To our sleep deprived ears, it was almost a lullaby.

The restaurant had a love affair with wood. The floors were wood, the chairs were wood, even the walls were wood panelling. Thank goodness people don't smoke in restaurants anymore. The only non-wood portion of the walls were a ridiculous amount of TVs. Last night they must have been showing in tandem with *The BIG Game*. Today they lacked such coordination. It was a jumble of golf, two different hockey highlights, financial news, soap operas, and of course The Big Bang Theory. It made my headache worse.

COMMUNION

At our table, the waitress got us glasses of water. They arrived in day-glo orange cups. Almost fluorescent. Say what you will about H👀ters, they commit to the bit. We started the immense effort of reading the menu.[4]

My enthusiasm at going to H👀ters could not combat my lack of sleep. I was not hungry. I spent 10 minutes idly flipping through the menu, glancing over different wing specials and burgers. I came to an awful realization: *never in my life have I wanted wings less*. Tragically, H👀ters is known for its wings. In the end I knew what I had to do, but I couldn't martyr my stomach. I got chicken tenders.

A fun note on the H👀ters menu: the last page is entitled *local favourites*. What? There is no way there are "local favourites" at H👀ters. Half of the page is taken up by a H👀ters girl, smiling and saluting with a camo version of the classic H👀ters uniform. These two things combined make it the most American image I can imagine. Altogether perplexing to see at in Saskat👀n.

We placed our order and waited eagerly for our food to arrive. Overall, the service had been excellent! Shoutout to Katie! My chicken tenders were nicely sauced and appropriately crunchy. My waffle fries were salty, but fries are always good. Across the board I'm very happy with the food at Saskat👀n H👀ters.

DOES IT PROFIT A MAN TO GAIN THE WHOLE WORLD AND FORFEIT HIS SOUL?

I headed off down a hallway to the washroom — or to what I *thought* was the washroom. Instead, I peered through a curtained archway to find a room full of slot machines. At last, a second thing to do in Saskatchewan.

What? Why are there slot machines at H⬤⬤ters??????

The room had five slot machines on each side, softly pulsing with LED lights, inviting me to test my luck. Despite it being Monday morning, there was a lone gambler tapping away in the corner.

According to research done by beloved award-winning **mathNEWS** writer *molasses*, in Saskatchewan it is legal to have slot machines in a restaurant. The machines are run by the Saskatchewan government and are considered a game of luck. Which they consider fine! In the eyes of the Ontario government this is a big no. But that's why different provinces exist.

REVELATIONS

Saskat⬤⬤n H⬤⬤ters was a surreal experience. Perfect restaurant, no notes. 10/10.

rockfacts

1. See **mathNEWS** 154.2
2. Two
3. My prior research in H⬤⬤ters notes this is a common occurrence
4. At least half of it was just different drinks, mainly alcoholic because this is a sports bar. They also had snow crab legs??

"HELP, MY AUDIO STUTTERS ON HIGH LOAD IN LINUX"

```
sudo grubby --args="preempt=full" --update-kernel=ALL
```

jeff

IT'S MARCH 2020

The Friday before March break wasn't normal, and I think everyone was a little paranoid. Some students decided to go home early, but I stayed. At some point, a bunch of us went into a classroom and played some social deduction game. I ended up quite enjoying it too. Something that could have never happened on any other day. When I left, I took out an instrument to practice, though it wasn't the one I usually played. I don't think I ever practiced, so it just sat there.

I was finally able to return it in the summer, but it was still March. Doesn't matter that it was warmer and that school stopped, that's just how time worked. The next two years… well, maybe they don't really matter, because time didn't run normally. It was March 2020 when I graduated too, and I'd say we were all glad we got to experience a normal one.

I pass by a friend from high school and I'm reminded that it's still March 2020 and we're all still here, but I pass by a friend from high school and I wish I flew. I wish I flew far, far away, where it's not March 2020 anymore. I start meeting new people but never stop meeting old people, so time stays the same.

I'm crying and alone and maybe it's just because things just aren't fair or maybe it's because of some other bullshit reason I dream up but I'll pull it together and when I do, I'll go up and help a friend on homework cause that's what I was doing before, and they'll remain oblivious, but it'll be okay, 'cause I'll go to bed and I'll wake up and when I wake up it'll be March 2020 and everything will be okay because it's March 2020 and everything was okay when it was March 2020 because everything good that's ever happened to me happened in March 2020.

stuck here

prof**QUOTES**

MATH 119: FLORIAN GIRELLI

❝ Theoretically it does not matter [what order you integrate in]. In practice, it sometimes matters.

❝ It's Friday, let's do the y slicing. It's the end of the week, let's do something crazy!

❝ A circle is a straight line.

❝ A disc is a rectangle.

❝ What do you do then? You start to cry.

MATH 235: CONRAD HEWITT

❝ There is some stuff going on in the back of my head, some crazy stuff.

❝ You've got 3 things to play with, and you've gotta make them fit into 4 holes. That's probably not gonna work.

❝ This is going on in the back of my head… along with some other stuff that you don't wanna know.

MATH 247: STEPHEN NEW

❝ I'm just talking to my own brain and telling it to stop doing number theory.

❝ $n_{l_{k_j}}$

❝ *[Student: "Does the Bolzano-Weierstrass theorem hold in infinitely many dimensions?"]* So, there's a homework problem…

❝ You just need infinitely many fingers.

❝ There's pure math, and then there's impure math, which is real life.

❝ What letters haven't I used yet…

MATH 249: SOPHIE SPIRKL

❝ Why is this true? Because Taylor series. We can also do a proof by example.

❝ No edge goes through a cat; that would be weird.

❝ This is very important cat science.

PMATH 333: STEPHEN NEW

❝ A lot of students enjoy thinking about the axiom of choice.

PMATH 348: YU-RU LIU

❝ You guys are amazing. It's an 8:30 class and there's a 70% attendance rate. I should give you guys credit. *[Student: "For credit, can you give us like 2 points bonus on the exam?"]* Uhhh, anyways, I'm sure you guys have heard of repeated roots before…

PMATH 352: NICO SPRONK

❝ Every calculus teacher has three favourite intervals: $(0,1)$, $(-1,1)$, and $(0,\pi)$. Those are the only three intervals.

❝ If you start playing around on the imaginary axis you realize that it's cray-cray not bounded.

❝ *[Student: "Shouldn't that be $1/a_n$?"]* Oh, yeah, fuck.

❝ I taught MATH 135 last month, I swear it turned my brain to mush.

❝ I'll throw out some Lego bricks and a modest instruction manual and leave the rest to you.

PMATH 370: BLAKE MADILL

❝ Oh, they used a shit marker, I hate them.

❝ 3 is the smallest natural number.

CS 146: BRAD LUSHMAN

❝ When I say it feels magic, it means there's a chance we're being lied to.

❝ Welcome to adulthood. It sucks.

CS 146: EDWARD LEE

❝ Let's pretend I know how to use vim.

CS 246: CAROLINE KIERSTEAD

❝ With C++20, yes! We have the spaceship operator. I keep wanting to call it rocketship, but its called spaceship… *[Writes* `operator⟺` *on the board]* … Does that look like a spaceship to you? Looks more like… a UFO?

CS 444: YIZHOU ZHANG

❝ As you can see, the runtime state of the compiler is quite complex. Good luck to those groups who are using C++ or Rust.

❝ We call this sort of situation "going wrong."

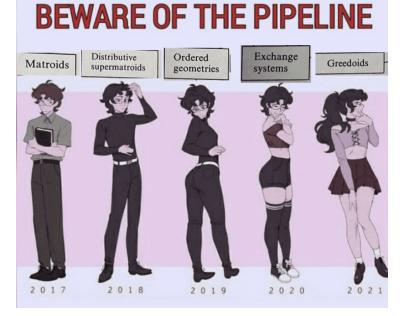❝ I will describe [the Java compiler] as a *best effort* to implement what the Java Language Specification says.

ECE 124: ANWAR HASAN

❝ Erasable prom. If your prom was not good, you erase it from your memory.

❝ Those who have come here, I really appreciate your dedication to this course.

❝ I have many, many flip-flops.

ECE 459: JEFF ZARNETT

❝ Our bad luck is somebody else's good luck.

❝ Life is full of things that are inherently sequential—you have to open your garage door before you take your bicycle out of the garage, otherwise that's bad for both the bicycle or the door.

❝ It's like writing a will for the thread—if I die, here's what should happen to my memory.

❝ Please don't copy and paste this into your actual bank job software.

❝ If only you could unpost things that you post on the internet…

❝ It goes into an infinite loop, hence becoming a "cursed thread."

❝ I'm pretty sure the population of Bulgaria is more than 3.

❝ I have extreme doubt that the population of Bulgaria at this exact moment is seven million point zero people.

❝ The two strategies are: skip some parts of the work, or, intentionally reduce strategies to speed things up. You may implement both of these strategies when you're writing an exam.

❝ Nothing like a little murder to speed things along—put some fear into the other threads.

❝ The outcome is already known: I'm really bad at Mario Kart.

❝ Let's go on a trip. *[Opens Google Maps]* It's like Geoguessr but worse.

❝ We'll give it one more try. This is how gambling works.

❝ One example of trading accuracy for time is when you're trading no accuracy for a ton of time.

❝ *[Watching a YouTube playthrough of Quake III]* You can see that this is not exactly a photorealistic game.

❝ I don't want to do this. I hate this, and if someone put this up in a code review, I would say, "Why did you do this?"

❝ This isn't best practice… unless it is, because you care about performance.

❝ Why be patient when we can be impatient?

❝ We'll see if I can make the laptop cry a little.

❝ Other options are bad, don't use them… unless.

❝ You wrote your code this way, and the compiler says, "I have altered the deal, pray I don't alter it any further."

❝ "This problem is too hard so I will solve an easier one" is not a strategy I would recommend on exams.

❝ This thread is sponsored by pthreads library.

❝ Disney worked very hard on extending copyright, but that kinda ran out of steam… no pun intended.

❝ "Speed limit" is not so much a "limit" as it is a "target."

❝ Roll however many natural 20s you want, it's not going to happen.

❝ How do things get non-16-byte-aligned? What would cause this terrible thing to happen?

❝ The road we're on has no turns.

❝ Did that make it faster? I'm sure it did. Did I hate doing it? Absolutely.

❝ Here's the thing: the computer doesn't really care.

❝ The Danish number system is insane and I don't want to get into that.

BEWARE OF THE PIPELINE

Matroids | Distributive supermatroids | Ordered geometries | Exchange systems | Greedoids

2017   2018   2019   2020   2021

FAIR REDISTRICTING PRACTICES PART 3

…And we are back this issue with another part in our series all about redistributing and redistricting! This time we are delving into some more urban layouts and this time even some law.
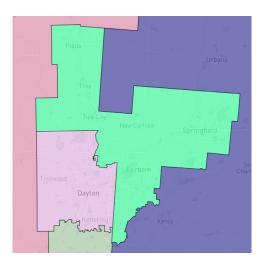
<p style="text-align:center">ɛ̃</p>

HUB AND SPOKE

Imagine an airline's map of destinations all originating from a core city (the hub) and going towards various destinations surrounding it (the spokes). There are some American cities that span an absurd amount of area where it looks similar to that. There is a central city (the hub), and a series of outer cities typically in a line following major highways all around it (the spokes).

If a spoke is worth about a district then then you don't have to do much with it. If it isn't, you could take a chunk from the hub city to fill in the remainder, or if an adjacent spoke is enough to make one district, you can create what reminds me very much of some macaroni. The following are two examples of such macaroni formed from some spokes surrounding Columbus and Dayton in my Ohio state senate map.

UNDERPOPULATED DISTRICTS

In Canada, under certain circumstances, you are allowed to have electoral districts whose populations are far below average, unlike in the US. This is because of a landmark decision by the Supreme Court of Canada that saw that the Charter's "right to vote" did not mean "one man one vote" like in the US, but meant "effective representation" instead.

The result of this is that, while usually every district would have a similar population (typically within a 10% or 25% deviation as prescribed by law), you are allowed to go beyond 25% in "very special circumstances" which is not specifically defined in the legislation. This means that whenever a commission creates such a district, they provide reasoning and justification as to why such a decision was made and why it was a "very special circumstance" for real, for real.[1] Usually this is applied to sparsely populated districts found most often in a province's north. Having northern districts be within the population deviation would mean that the area to be represented would become far too large for one member, thus "effective representation" would not be provided to constituents.

So, when you make such districts, at least keep in mind the justification given for when you create them. Also keep in mind that it need not be northern districts. Quebec's provincial district of Îles-de-la-Madeleine is not a northern district but still gets the "very special circumstances" treatment for being some islands far from the rest of the Gaspé Peninsula.

NESTING

Sorry to disappoint, but this part has nothing to do with geese.

Unlike the unicameral provincial and territorial legislatures in Canada, US legislatures are bicameral with a state house and senate, except Nebraska because they're not like the other states. With two chambers, you may think you will always need to make two maps, but that isn't always the case. States can choose the ratio of seats between the two houses, and should they choose a whole number N for the ratio 1:N, then "nesting" could apply. Typically N = 2 or N = 3.

For states that mandate nesting, there are a couple possible options they can choose:

1. Each state senate district is made by combining N state house districts.
2. N state house districts are made by splitting one state senate district.
3. N state house members are elected from one state senate district.

Option 3 is the only one where you will produce just one map. The other two still require making two maps, but the process becomes simpler. However, an additional layer of complexity

becomes added as a consequence where you will need to make sure the state senate district and the nested house districts are all fair when making them *simultaneously*.

Lastly, be careful to not be fooled. While states with strict nesting implies a whole number ratio of 1:N, the reverse is not true. Always check if a state prescribes nesting, and what method it chooses.

A LITMUS TEST: NAME YOUR DISTRICT

I find that one of the best ways of helping to determine how "fair" a district would be, is to try naming it like in Canada. It's quite simple if you think about it. A gerrymandered district meanders through and splits apart whatever place it's in, making it near impossible to give it a distinct and succinct name. A more "fair" district keeps communities of interest together which will make naming much simpler than not.

In some sense, it will also end up forcing you to learn about the location you are redistricting. For example, when I was making districts of Pennsylvania, and New York, it really helped me to imagine what names I would give to the districts I made. For example, I found out about the regions of Northern Tier and Southern Tier which helped in adjusting my districts. Another was my deep dive into figuring out the various neighbourhoods of New York City for its state assembly districts. Distinct neighbourhoods with a well-known and strong identity are a classic case of "communities of interest" thus ensuring they should not be split between districts if possible.

Sometimes you may find yourself figuring out a banger name for a district only to realize you can't quite reasonably use it unless you make a slight adjustment. You may not have spotted them if it weren't for trying to name your districts.

<div align="center">ꙮ</div>

This is the end of part 3! You can expect yet another assortment of redistributing and redistricting in the next ~~episode~~ issue, and if any readers have decided to make some maps since part 1 of this series, please show me! I find that people have different styles and sometimes unexpected decisions made in their maps, and they're fun to spot and interesting to figure out yourself.

If you want to get started yourself and missed part 1, you can go to <u>ridingbuilder.ca</u> to make Canadian districts and <u>davesredistricting.org</u> to make US districts.

<div align="right">*boldblazer*</div>

1. In the case of Newfoundland and Labrador's commission, they provided an entire essay's worth for the electoral district of Labrador. <u>https://redecoupage-redistribution-2022.ca/com/nl/rprt/othaut/p4_e.aspx</u> *[Editor's note: Newfoundland mentioned ‼ ☝]*

DRUGS! II
CUTS, BUFFS, AND ADULTERANTS

Today we will be talking about various things added to drugs. We will separate them into three main categories: those that have no psychoactive effects, those that have similar psychoactive effects as the main substance, and those that have different/antagonistic/unexpected psychoactive effects.

CUTS

Cuts are inert substances added to drugs to bulk out the weight/volume. Cutting agents are usually cheap and easy to obtain. Sometimes cuts are also used to improve the physical properties of drugs, making them easier to dissolve, or keep pills more structurally stable. Cuts usually decrease the efficacy of a drug. Diluting the drug can also make it easier to dose.

Examples: flour, sugar, cornstarch, methylsulfonulmethane

BUFFS

Buffs are substances that enhance/complement the effects of the main drug. These are usually also cheaper than the main drug, and sometimes have more drastic effects.

Examples:

- Caffeine in stimulants (commonly seen in MDMA, cocaine, ketamine, meth/amphetamine)
- Levamisole (horse dewormer) is sometimes found in cocaine, and is rumoured to give a more intense high. Toxic in large amounts.
- Non-opioid painkillers and local anaesthetics in downs (usually cocaine). Have various side effects, and can increase risk of injection injuries.
- Fentanyl or fentanyl analogues in other opioids. These are often much stronger and can lead to overdoses if unexpected.
- Benzodiazepine (non-opioid sedative) and xylazine (veterinary tranquilizer) in downs. Very common these days, common cause of overdoses, and cannot be reversed with naloxone.

ADULTERANTS

Adulterants are psychoactive substances that act contrary to the main drug. Many of these are the same substances as buffs, just mixed into different bases. Fentanyl and its analogues are among the most commonly found in non-depressants, leading to many overdoses, but not too difficult to reverse with naloxone.

Beware of the chocolate chip cookie effect when testing your drugs — just because it's not in your sample, doesn't mean there's no impurities in your whole batch of drugs. Always start low and go slow!

<div align="right">*RapidEyeMovement*</div>

RE:RE:PORTER

APPARENTLY I'M AN AIRLINE SHILL NOW

I'm not from Waterloo or the GTA, so unlike (what feels like) around half of the students I meet at Waterloo, I can't drive to and from home from university. I am, however, from a part of the US that's close enough to reasonably fly to and from for reading weeks and inter-term breaks. It's not that cheap by any means, but Porter Airlines' flights aren't *too* pricey, and compared with the international tuition… well, that makes it feel more like a drop in the bucket.

"Porter welcomes you." I've heard that recorded audio play on landing enough times now that I know just about when they'll play it, and a good few words that follow as well (mostly stuff that everyone else disregards about remaining buckled before arriving at the gate).

I haven't always had a perfect experience on Porter's flights, but overall they've been quite good. I'm certainly influenced by the free drink on each flight: they have good wine[1] and beer[2], and that counts for a lot. But what I've always found weirdly fascinating about Porter is their bimonthly (every two months, not twice a month) in-flight magazine: **re:porter**.

I mean, first of all, what a name. It's actually perfect. It's distinct and memorable, but not cheesy or forced.

The physical thing itself takes the form of a roughly fifty-page booklet, with a large cover photo showing a happy person enjoying one of Porter's destination cities. Underneath the photo are a few teaser texts highlighting what I suppose are the articles they care to show off most. One of these articles always features the city of the cover photo.

I'll say it straight-up: the meat is interspersed with a bunch of full-page ads for grown-up things like real estate, expensive tourism, and wine. But the frequency of those is lower than I'd expect. Not sure what I base my expectations on, though.

Every article has an English and a French version, and if you look closely, you can tell that the French isn't just machine-translated garbage, but was done by a real person (I think).

As for the kind of articles, some are a bit boring (showing off fancy things you can buy at Porter destinations at prices that are probably out of range for all students reading this) but there's usually one article that gives a list of places to visit for a given city. Each place is accompanied with a description and often a bit of history. It's a fun cultural history lesson that's often (for real for real) actually interesting. There are other article formats that provide something similar as well; the most recent issue of **re:porter** describes the history and state of Edmonton's park system, as well as the author's Segway ride through one of the parks. (The author wrote that they felt "as nimble and graceful as an owl, silently gliding among the trees and paths lining the North Saskatchewan River.")

Closer to the end of **re:porter**, there's usually a cute "A Day in the Life" segment about one of Porter's employees, and it's not limited to its pilots, flight attendants, and C-suite executives.

There's also a spread showing off its planes and their environmental friendliness. They always claim that their planes are the most fuel-efficient out there. I haven't independently verified this; maybe I should.

For the kids out there (apparently including me), there's also a "Spot the Difference" in the back which honestly isn't a gimme. If you know the eye-crossing trick though, that helps. I only do that to check my answers (cheating is bad :c).

All passengers are free to keep the copy of **re:porter** from the seat back in front of them. Sometimes at the end of the flight I ask for a fresh one cause I don't want one that's been handled by others; sometimes I get one, sometimes I'm just given one from another seat instead. I have thirteen in my collection now, the oldest being the November/December 2019 issue.

What fascinates me so much about **re:porter** is its unexpectedly high quality for the airline's size. It has almost no typos, it has a generally aesthetically pleasing look that's been consistent across at least five years, they have a set of segments that are repeated across issues, and the content of the articles is frequently actually interesting. Reading it when I'm flying is nice because it helps me step back from the stress of travel and absorb info from paper for once. Meanwhile, according to Google search result text snippets from various sources, Porter has around 1500 employees. That's a lot of people, but almost everyone has to be involved with the actual airline operations. Where in the organization and the budget is there the space for the work on **re:porter**? And how does Porter do this when no bigger airline I've flown on has had anything comparable?

I only noticed in January that the answer was right there in their masthead: "**re:porter** is edited and produced by Strategic Content Labs, a division of St. Joseph Communications."

Of course they outsource the work to a marketing consultancy. How did I not consider that sooner? There is nothing holy on this good green earth.

Whatever, it's a fun read anyway.

cutlet

You can see copies of **re:porter** online here: https://www.flyporter.com/en/travel-information/inflight/magazine. Notice that just below the breadcrumbs but above the page title is the text "foobartest1." ☺

I've been meaning to write this article since February 2022, but never got around to it. I want it to be known that half of why I wrote this article was to be able to title it what I did.

1. I'm not a huge wine enthusiast so no one come yelling at me about how their wine is bad or anything. It tastes good and that's enough for me.
2. There's a kind of beer called "porter"; it was very exciting when they had the "Porter porter" for I want to say a year or so.

ELITISM? IN MY SYNCHRONIZED SWIMMING?

IT'S MORE LIKELY THAN YOU THINK

I have a complaint about the new Canadian Artistic Swimming scoring appeal system, and I'm using my platform on **math**NEWS to talk about it.

For anyone who somehow doesn't have extensive background knowledge of synchronized swimming, there have been major changes in the past few years on how routines are scored. Specifically, each routine has a "declared difficulty" score, that's based on the elements that you declare and the sum of their associated difficulty. For example, a 360-degree twirl has a difficulty score of 0.6, and a sustained fishtail height of 3 or more seconds has a difficulty score of 0.5. So, if you did both of those things in one figure (upside down underwater section), your declared difficulty so far would be 1.1.

When you swim, an official watches your routine, and "base marks" all figures in your routine where you execute your declared elements incorrectly, e.g. don't finish the full 360 spin. A base mark means that the difficulty score for that figure is replaced with 0.5 (here, it would replace 1.1). Your execution score (marked out of 10) is multiplied by your difficulty score per figure, so this is a big deduction.

Now, the issue. Once you receive the marks for your routine, you are allowed to appeal the granted difficulty if you think you executed something correctly that they marked down. They film every routine, so officials can just rewind the video and watch the element again to confirm. However, now it costs $100 to request an appeal. I don't have much to say other than it's completely unfair to add a monetary barrier to judging. It's their job to assess the correctness of elements, and I don't think anyone should have to pay extra money for them to scroll backward in a video for 2 seconds. It just adds another layer to how ridiculously expensive synchro already is, as well.

I hope everyone enjoyed this somewhat useless rant about the newest synchronized swimming policy implemented in the Canadian university league. I promise this is useful information and will show up on the midterm.

peacelovemath

TOP N OVERRATED NON-UBER RARES IN BATTLE CATS

#3 PIZZA

Pizza is very overpowered during the early to mid-game, as it is a mid-range spammable unit that has relatively high attack and defense. However, it falls off very hard late-game due to a combination of its lack of range, foreswing speed, and defense (per knockback), as enemies tend to push quite hard so Pizza can end up being juggled around without landing any hits. As such, it is outclassed by several uber rares (like Jizo and most units from Sengoku Wargods Vajiras), and even a few non-uber rares like Heavy Assault C.A.T. and Dark Lazer.

#2 CYBERPUNK

While there's a whole meta on stacking these units to perma-slow enemies, this strategy requires extreme patience as its cooldown is 3 minutes, and at least 3 Cyberpunks (2 if talented) are required to perma-slow, assuming they are timed correctly. More importantly, it becomes much less viable in the mid to late-game, as bosses would tend to spawn on a timer rather than on base hit (which in most cases would happen way before you can spawn a second Cyberpunk). And there are more fast and tanky enemies that can easily get into Cyberpunks' blind spots, while piercing backliner enemies allows them to get in by wiping out the meatshields protecting the blind spot. It will die in one hit by almost any enemy, and even with a survive talent, it does not work very well as a '2nd chance', as usually it is not knocked back enough for enemies to get out of its blind spot.

#1 SUPERCAR

Even though this may seem like a similar version of Slime, dealing the same big damage to one enemy and immediately getting killed, there are several disadvantages that makes it much worse. Even though its range and foreswing speed is slightly lower than slime, this is enough to make it significantly hit less often before dying; in fact, it usually hits too rarely to be worth using. It also lacks a wave attack and has longer cooldown, making it even more high risk and lowering its overall effective dps even when all attacks hit. Its only advantage over Slime is knockback, barrier breaker, and shield piercers, which are usually more effective on other units that don't immediately die after attacking once.

cultured Battle Cats enjoyer

Greedoids
@ **Greedoids**

oh you like **Greedoids** ? name every **Greedoids**

8:22 PM - 18 Oct 2019

SEDPUZZLE ->

SedPuzzle was a brilliant, clever, and free browser-based puzzle game, and now it's nothing. Empty. The website, `https://sed-puzzle.com/`, is still up, but it's all blank. You can try to log in, but it won't work no matter what you do. It's completely nonfunctional.

But what even was SedPuzzle? In short, it was a puzzle game based on the Unix utility `sed`, which is a tool for parsing and transforming a stream of text. One of the common uses of `sed` was to replace certain patterns in a string with another string, and it is this functionality which SedPuzzle's singular mechanic was based on.[1]

SedPuzzle puzzles present you with an initial string of text, and a set of buttons which each replace the first instance of some text fragment into some other text fragment. Your goal is to use the buttons to turn the initial string into the empty string. That's it! Simple, right? Let's take a look at an example.

Let's say the puzzle looks like this:

```
SedPuzzle
Sed  → Puzzle
Puzzle →
```

Well, it's not too difficult to see what to do here. First, you use the first replacement to turn `SedPuzzle` into `PuzzlePuzzle`. Then, you use the second replacement twice to turn `Puzzle` into nothing, one instance of `Puzzle` at a time. You're left with the empty string, so you win!

Well, how about this next one? On the original website, the title of this puzzle was "Tree Balancing."

```
((((((())))))
(() → ()(      )( → (()
()) → )()      )() → ())
((()())(()()))  →
```

Don't forget that each transformation only works on the first instance of the fragment at a time. Yeah, this is going to be quite a bit harder.

Generally, the first step to solving one of these puzzles is to figure out what the string represents and what the transformations represent. Sometimes they're just text with no deeper meaning, but other times they do represent things. In this case, the title gives it away: the initial string is a representation of a tree with 7 nodes. You start with all the nodes connected one by one in a line, and your goal is to get to the balanced binary tree via the provided tree transformations. The next step is to see what the transformations preserve. With some thought, you can see that they preserve the number of nodes in the tree, and they just rearrange them. Now you just have to solve this new puzzle about trees, now that the facade of text has been stripped away. Oh, look, it was math all along! Who could have guessed?

I don't remember my solution to that puzzle. But if you think you've figured it out, you can try it on "Tree Balancing Hard":

```
(((((((((((((((()))))))))))))))))
(() → ()(      )( → (()
()) → )()      )() → ())
((()()))((()()))(((()())(()())))  →
```

Puzzles could be really anything—simple, complex, easy, hard, short, or long. Here's one I remember enjoying in particular, called "Flatten":

```
..........?ə?ələo?əo?..........
? → .     ? → o      ? → ə
.ə. → o.o     .əo → o.ə
oə. → ə.o     oəo → ə.ə
.əə. → oooo    .əəo → oooə
oəə. → əooo    oəəo → əooə
........oooooooooooooo........ →
```

I think this one is fun enough that it deserves not being spoiled. I will say that there are essentially three "steps" to solving this one. You have to first replace all the question marks, then do a bunch of manipulation to get to the string with all the "o"s, then finally replace that to get the empty string. If you want to try out the puzzle, I recommend that you try making a simple script so you can try to play with it in a terminal/command prompt or something; it's a lot more fun that way.

Many puzzles, maybe nearly all, were user-submitted. There was an account system and leaderboard to see who could solve the most puzzles and who could solve in the least number of replacements, and so SedPuzzle was quite community-based in that way. One prolific puzzle creator had the username `snuke`, and I was told by a friend that they were pretty big in the competitive programming scene. Over its lifetime, SedPuzzle amassed at least a couple hundred puzzles, and I found that they got pretty hard. I only ever solved probably about half of them, possibly even fewer.

And now it's gone. I don't have any idea what happened to SedPuzzle, but it doesn't look like the actual puzzle part of the website still exists. I tried to do some internet sleuthing to figure out where it went or if there was any announcement regarding it, but all I found online was radio silence. Maybe someone out there knows why this fantastic little puzzle game had to go offline, but I don't have the slightest clue.

There is one remnant online, a similar, much smaller game based on puzzles where the only replacements were `A → BB` and `B → AA`. It still is fun and captures some of the enjoyment of the original. You can find it at `sed-alternating.web.app`. But as much as I wish it were otherwise, it seems the original SedPuzzle was lost to time.

It is somewhat sad that this is how it ended. Though I suppose it is only fitting that, much like the puzzles within itself,

SedPuzzle left by being transformed into nothing for the last time.

hyperlynx

1. The syntax for the sed script for replacement, `s/{from}/{to}/g`, apparently was popular enough that over the decades, it made its way through chatrooms and such and is now, in the form of `s/{from}/{to}`, a supported way to edit your last message with a single replacement—exactly how SedPuzzle works. That means you can play SedPuzzle in a Discord channel if you wanted! Although it would be pretty scuffed. Also, unrelated to SedPuzzle, but try posting a tenor gif to a Discord channel, then sending `s/e/x` to the same channel.

NEW 2024 SCRABBLE WORDS :O

PART 2: JUST THE LETTER D

This is a continuation of a series I started last issue. Look at me, actually writing a "part 2" for something! My parents would be so proud. It's almost enough to make me shed a tear. Before I get too off-topic, I'll actually start with the content of this damn article.

Oh wait, one more thing. I'm writing this article, which is due at 10 AM tomorrow, when I have a chemistry assignment due at 11:55 PM tonight. No, not 11:59. 11:55. For some reason completely unfathomable to me. So, if this article seems to have weird, sharp tonal shifts, it's probably because I took a break to work on that. Okay, now I'll actually start with the quirky new Scrabble words.

- **Dabbings**: About ten years too late and a plural no one uses, but it's fine I guess.
- **Dashcam(s)**: r/idiotsincars is leaking.
- **Datafile(s)**: It's now a compound word wooo
- **Daughterhood(s)**: These weren't words before?
- **Deadass**: Only about 3 years too late this time…
- **Dealbreaker(s)**: I support these being added; it's about time.
- **Deboard et. al**: We already had a word for this. It's called "exit." Or "get off of." Not hard.
- **Decaffeinate et. al**: This one's for all the two people out there who actually like decaf. Couldn't be me. Especially since I don't even like coffee normally, either.
- **Declaratives**: More plural forms wonderful
- **Deepfake(s)**: Something that is actually still relevant, nice.
- **Deflationist(s)**: "One that advocates deflation (a general reduction of prices)." I can certainly get behind this.
- **Deleaf et. al**: Who is out here saying they "deleafed" a place? Just say you got rid of the leaves. It's really not that hard.
- **Delegitimise et. al**: Britain is leaking again.
- **Demonym(s)**: "A name given to a geographical group of people." The word sounded a lot cooler without knowing the definition but okay whatever, I guess.
- **Denialism et. al**: Fairly topical.
- **Deplatform et. al**: Another one that's actually fairly relevant. I must say that I'm pleasantly surprised.

- **Destreaming**: Someone should really stop me before I start ranting about the Ontario education system…
- **Detritivorous**: I like this one if only because it doesn't seem like it should be real, but it is, and I'm so here for it.
- **Difficultness(es)**: ???? Difficulty???? We already had better words for this why are these being added
- **Dissymmetrical**: Again?? We already have asymmetrical this is NOT NECESSARY
- **Dogpile et. al**: Another fairly topical one.
- **Dox(x) et. al**: Who out here is using only one x in doxx? Anyways, still very relevant **cough* SSSniperWolf *cough**
- **Dumbphone(s)**: " A cell phone without email." Oddly specific but I like the idea.
- **Duodecimally**: This one is quite fun to say out loud.
- **Dystopic**: How was this not here before? Howwwww? I don't understand how this game works.

The deadline to submit is in like a minute shoot okay I gotta go byeeeee

sexy_software_babe

mathNEWS VALENTINE

mathNEWS will never reject you(r articles (maybe))

mathNEWS will give you free pizza when you hang out

There has never been a greater love in all of history than **mathNEWS** Writer and **mathNEWS**[1]

PlatypusGod

1. Unless this article is rejected, then this relationship is over *[Editor's note: this article originally miscapitalised every instance of "***mathNEWS***." You're on thin ice.]*

THE SECRET TO XIMILU IS ACTUALLY GOOD COCONUT MILK

XIMILU (COCONUT TARO DESSERT SOUP)

Serves 8

INGREDIENTS

- ½ cup uncooked small white tapioca pearls
- 2 lbs large taro root
- 1 can Aroy-D coconut milk (or your favourite brand)
- yellow rock sugar or granulated sugar to taste
- water

DIRECTIONS

1. In a large pot, bring ~6–7 cups of water to a boil.
2. Add in the tapioca pearls, turn down the heat to medium low, and cook around 25 mins, or until the pearls are completely translucent (if there's still a white dot in the centre, keep cooking). Stir occasionally so it doesn't stick to the bottom and burn.
3. Meanwhile, peel/chop the taro root into ½ inch cubes. If your skin is sensitive to taro root, try wearing gloves (some people react poorly to the sap from the root).
4. Once the tapioca is ready, pour the contents of the pot into a fine mesh strainer. Put the tapioca pears into a bowl full of very cold water until you need them.
5. In a large pot, bring 4 cups of water and half the prepared taro to a boil. Add in the sugar to taste (¼ cup sugar or 3 sizeable lumps of yellow rock sugar is a good starting point).
6. Turn down to a simmer. Simmer until slicing a cube in half reveals no white flecks, about 15 mins.
7. Add the can of coconut milk into the pot, along with the remaining taro. Turn to medium and cook about 10 minutes, until the newer taro is pierced easily with a fork or chopstick.
8. Turn down the heat to a simmer. Try the soup and see if it needs more sugar, adjusting accordingly.
9. Finally, stir in the tapioca pearls (make sure to strain out the water it was resting in beforehand).
10. Serve warm (or chilled!) in bowls.

RANT

I once paid out in the ass for this fancy-looking coconut milk at Zehrs. Okay, realistically it was only like 50 cents more expensive than my usual brand, but still. The brand was called Thai Kitchen. Now, I have great respect for Thai cuisine's ingenious usage of coconut milk in various dishes, both salty and sweet. So I thought, "why not, what's the worst that could happen."

I buy 3 cans (do NOT buy multiples of something you're trying out for the first time, even if it's on sale, as I am about to discover).

I give it a good shake to mix the cream and the rest of the liquid together, crank that bad boy open, and give the lid an experimental lick. (do NOT do this, there is the very real risk of cutting your tongue on the serrated metal edge. This is one of the few dangerous risk-taking behaviours I allow myself to indulge in, just like how some people enjoy the thrill of riding a motorcycle 20 over the speed limit on the highway. Let me have this and do not follow my example.)

It tasted… bland. Like if someone whispers "coconut" next to a can of very thick, heavy water. I was supremely disappointed. Luckily, I was making a pretty complicated curry that day, and not something like this recipe where there's only like 4 total ingredients.
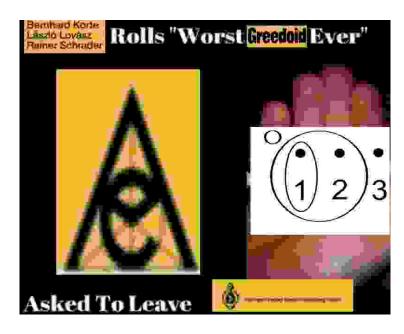
Honestly, the amount of actual English sentences on the label of Thai Kitchen coconut milk should've been a tip off to me that no Thai person would actually use it to cook. My bad.

So yeah, for a dish like this you definitely want a coconut milk that you know for sure actually tastes good. It's been about 2 years now and I still think I have a can of Thai Kitchen in my closet, whispering, begging to be used. Eventually I will dig it out and put it to rest in some dish where coconut milk is not a star ingredient, but until then it will serve as reminder of one of my earliest grocery blunders.

☙

Happy Lunar New Year to those that celebrate! ^_^

yummyPi

MYSTERY SOUP RECIPE
MAKE THE MOST OF YOUR INGREDIENTS

In the age of inflation (or just being cheap in an attempt to exercise one iota of control of your life in a world that feels like its drifting further and further out of your control…), it is important not to waste too much food. Lots of recipes, as great as they sound, always seem to require a great number of ingredients you need to buy in bulk and never use again. I do not need a metric ton of fresh dill, nor a truckload of mustard seed, only to use 1 tbsp in a recipe. Fortunately a salve has been produced to heal this great gaping wound. Soup.

So, one Friday, when I decided that that I needed to rid myself of the Naturally Imperfect carrots that have resided in my fridge for the last month, Soup came calling. Using the culinary skills I refined at Noma in Copenhagen, I typed the words "Carrot", "Lentil", and "Soup" into an obscure culinary aggregator known as Google, I came across a recipe by noted chef Elizabeth of the culinary journal Vancouver With Love[1]. Naturally, I did not have the requisite immersion or jug blender or spices to make this recipe. However, I did have a bunch of other shit that had sat too long in my fridge I needed to get rid of. I resolved then and there to get rid of all of the food I was going to throwout otherwise, no matter the cost. Drawing inspiration from my Lentil Soup recipe in **mathNEWS** 151.2, I added ginger and chipotle peppers in adobo sauce into a pot an hoped for the best.

In preparation for the monstrosity that this soup would become, I promised numerous soup shares to friends in order to lessen the burden of being forced to eat it for the next week. But, in a surprise twist, the soup tasted amazing? I received numerous compliments from the friends I shared the soup with and I actually looked forward to eating it the next day. Normally here would be a good spot for how this all relates to a life metaphor, but I am far too tired and still stunned by the soup's magnificence to come up with one. However, I will spread my "recipe" with the masses!

INGREDIENTS

- 1.5 diced onions you have been storing in the fridge
- Enough ginger to say, "thats probably good"
- 1 heaping spoon of your roommate's minced garlic
- 5 diced carrots you found in the back of the fridge
- The rest of your bag of lentils
- ½ can of chipotle peppers in adobo sauce, chopped
- 1 can of diced tomatoes
- 2 can of diced tomatoes full of water
- Vegetable or chicken stock powder
- Some milk (almond/oat/coconut is fine)
- Some olive oil
- Shakes of turmeric, cumin, coriander, paprika, salt, pepper, whatever else you want

INSTRUCTIONS

1. Heat the olive oil in a large saucepan on medium heat until shimmering. Add the onion, minced garlic, ginger and salt and stir to combine. Cover and let the vegetables sweat, stirring occasionally, until the onions are soft and translucent, about 5 minutes. Then, add the half can of minced chipotle peppers with the sauce, along with all your other spiced and stir for 2 minutes until fragrant. Then add the carrots and cook for an additional 3 minutes until coated.

2. Add in the can of diced tomatoes, lentils, milk, and stock powder. Fill the can of tomatoes with water twice to add to the pot, or however thick/thin you want your soup to be, then bring to a boil.

3. Once boiling, bring to a simmer and cover for 20 minutes. If you have an immersion or jug blender, showcase your dominance and blend this soup together. If you have a potato masher, like I did, attempt to try to mash the soup into a cohesive whole. Or if you can be at peace with the chunks, live your truth. Do whatever else you want with this soup. Let sit for 5 minutes.

Enjoy!

Lars Nootbaar

1. https://vancouverwithlove.com/lentil-carrot-soup/

Soup was too good this week to focus on achieving world peace, but next **mathNEWS**, keep your eyes peeled for a certain foreshadowed article.

ARTICLE

Daily reminder that learning is a privilege, not a chore <3

Enjoy the little things!

Remember to make the best out of the uni years as you'll only miss it when its done…

Live and learn ;)

You got this!

Invisible

HOW TO GET STARTED WITH MAKEUP: A GUIDE FOR THE MALE-SOCIALIZED NERD

So I got into makeup recently, and I've been having a ton of fun with it! But I faced a huge mental barrier with this, because it seemed so intimidating to get started with. So here's the guide I wish I had when I had started.

WHY DO I WANT TO USE MAKEUP?

- It makes you look pretty!
  - You don't have to look pretty for other people! You can look pretty for yourself.
  - You can look pretty for other people! This issue is too late for Valentine's Day, but hey, any day can be special when you're the special thing.

- It's fun!
  - Experimenting and trying different things, seeing how different you can make yourself look, is really enjoyable.

WHY DON'T I WANT TO USE MAKEUP?

- Expensive hobby…
  - I spent about $100 to start off. You can start off cheaper if you learn from my mistakes, but it still costs a fair bit.

- Kinda wasteful if you don't use it regularly…
  - Makeup has expiry dates, and is sold in quantities such that you are expected to use it fairly often if you intend to finish it before then.

- Kinda bad for your skin if you do use it regularly…
  - You can *probably* fix this with skincare but this is not the tutorial for that (I also don't know how).
  - I get around this by not using it regularly.

WHAT ARE THE VARIOUS MAKEUP THINGS I NEED OR COULD HAVE?

- **Tabletop makeup mirror:** you look at what you're doing with this. May seem unnecessary if you have a perfectly good bathroom mirror, but it's *really* useful to be able to see things close-up when you're working on your face.

- **Makeup brushes:** you apply your makeup with this. Get one big one and 1–2 small ones to start. You could also apply by hand but brushes do a much better job and are much easier to work with.

- **Foundation:** as the name implies, it's the base that you build the rest of your makeup on top of. You apply it all over your face skin, and it covers all your blemishes and contours in the skin with a flat texture. It should ideally be roughly the same color as your skin. This makes the things you apply on top of it look better, and also makes them stick better to your skin. This also means that if you apply *only* foundation your face may look kinda 2D, but that works for some people! Feel free to just apply foundation and see if you think you look good with it. Also if you have really pretty and clear skin you may be able to skip foundation. If so, I am very jealous of you.

- **Eye shadow:** this goes on your eyelids and makes your eyes look pretty. I thought I didn't want this until I tried it and it turned out I really wanted this. Also can act as "generic makeup" that can go anywhere on your skin if you try hard enough.

- **Eyeliner:** you use this to draw a line around your eyes and that makes your eyes look prettier. Anime fans, think of it as cel-shading for your eyes.

- **Mascara or fake eyelashes:** mascara is makeup you apply on your eyelashes to make them look bigger and thicker, and fake eyelashes are thicker and bigger hairs you stick on your eyelids. I use mascara because I'm afraid of glue near my eyes, but my friend who uses fake eyelashes swears by them. Easy way to make your eyes look more feminine.

- **Blush:** apply this on the part of your cheeks that collects into a ball when you smile, and it'll make them look rosy. Must-do if you did foundation, since it gives your face some depth again.

- **Highlighter and contour:** like foundation, but a few shades lighter and darker than your skin color respectively. Computer graphics enthusiasts can read this as "highlights and shadows"—you apply highlighter on places where where your skin is supposed to look brighter (e.g. tip of your nose, the cheekbone, etc.), and contour on places where your skin is supposed to look dark (e.g. if you apply it to the sides of your nose, your nose looks thinner, or if you apply it along your jawline, you can make it look more defined).

- **Primer:** you apply this before foundation and it makes the makeup stick to your skin for longer, and not melt away when you sweat or whatever. Not required if you're just experimenting or going out for a short while!

- **Makeup cleaning wipes:** for when you become Clark Kent again.

Note that I didn't mention certain things here, like anything to do with lips. This is because I'm only talking about things that I have used.

HOW DO I APPLY THESE?

Unironically, follow a tutorial on YouTube. Once you know what the words mean, you know what to look for. Search for "how to apply <thing>" for any value of <thing> I mentioned and you'll get good stuff. I don't want to tell you how to apply makeup, because it's much easier to explain visually, which is (I hope you understand) hard to do in a written article.

Practice a lot. You may like how you look the first time you try makeup, and you may not. Some stuff, like applying eyeliner correctly, comes with practice, and you get better over time. It becomes fun over time!

HOW DO I SAVE SOME MONEY HERE?

Be strategic with what eyeshadow you buy. Pink eyeshadow can be reused as blush, dark brown eyeshadow can be reused as contour, glittery eyeshadow can be reused as highlighter.

Skip primer, blush, and/or mascara if you're looking to save a buck and try fewer things. Skip the big brush and apply foundation by hand (do buy small brushes for eyeshadow though!).

CONCLUSION

It's expensive, moderately hard, and the cops can't stop you!

tendstofortytwo

HOLLOW KNIGHT CHARM RANKING
BY A CASUAL PLAYER

1. Wayward Compass
2. Long Nail
3. Shaman Stone
4. Unbreakable Strength
5. Quick Nail
6. Soul Catcher
7. Sharp Shadow
8. Mark of Pride
9. Spell Twister
10. Steady Body
11. Fragile Strength
12. Soul Eater
13. Unbreakable Heart
14. Carefree Melody
15. Stalwart Shell
16. Thorns of Agony
17. Grubberfly's Elegy
18. Quick Focus
19. Grubsong
20. Spore Shroom
21. Nailmaster's Glory
22. Hiveblood
23. Fragile Heart
24. Dashmaster
25. Deep Focus
26. Fury of the Fallen
27. King Soul
28. Grimmchild
29. Weaversong
30. Glowing Womb
31. Defenders Crest
32. Flukenest
33. Dream Wielder
34. Shape of Unn
35. Dream Shield
36. Sprint Master
37. Lifeblood Heart
38. Lifeblood Core
39. Gathering Swarm
40. Unbreakable Greed
41. Fragile Greed
42. Heavy Blow
43. Void Heart
44. Joni's Blessing
45. Baldur Shell

Fried Rice

STUDENT DEATH CENTER

Harrowing experiences awaited students returning to campus this winter.

Renovations to the Student Death Center (formerly known as the Student Life Center) were completed over the winter break. The building, a popular spot for dining and socialization, was inexplicably modified to be several times more lethal to students.

All guardrails were removed, and the stairs were reduced to a quarter of their original widths. Glass fragments were added to the Subway bread. Chairs were replaced with mechanical bulls, and electrical outlets were stripped to expose bare copper wiring. Speakers were hired to walk around and encourage recreational drug use.

"We think the new additions will provide a fresh experience for students," said university president Vivek Goel when asked about the changes.

There were no reported modifications to the Shawarma Hub.

snowdozer

IT'S THAT TIME OF YEAR
VALENTINE'S IS HERE

There's nothing like Valentine's in Waterloo

Someone under stress meets someone looking pretty

There's trouble in the air, you can smell it

And suddenly… a spark. You fall into a wormhole, sending you back to 3rd century Ancient Rome.

WHAT IS VALENTINE'S DAY?

As the day approaches, I started to wonder, what *is* Valentine's Day? We wind the clock back to 3rd century Ancient Rome, where Emperor Claudius II reigned as Emperor. Known for his military might, not only had he waged war on others, but he had also waged war on the very idea of marriage within Rome. With no wives or family of their own to tie them back, the thought was that they would become better and more willing soldiers. Because obviously in Ancient Rome, you had to choose between two mutually exclusive options — love, or war.

A WAR FOR LOVE

This is where Valentine ties into the story. Saint Valentine was a Christian priest who defied the Emperor's decree. He had continued performing weddings, in accordance to God's will, albeit in secret. However, his secret did not remain a secret for long, and he eventually ended up in a prison cell. Legend has it that he had healed his jailer's daughter's blindness, and had become acquainted with her. Before his execution on the 14th of February, he had written one last letter to his jailer's daughter — signed "from your Valentine." However, the exact contents of this letter are lost to time.

MODERN VALENTINE'S DAY

Through the blurry passage of time, the day had eventually shaped into what we now know as Valentine's Day. A day to commemorate our ideals of romance and love. But, this still doesn't answer my original question — why exactly were the day and the ideal linked?

The first explicit link I could find was by the poet Geoffrey Chaucer a millennium later, who had associated the day which birds found their mate with Valentine's Day. Eventually, the day had made its way into Shakespeare's works, which had shot it into the literary mainstream.

It turns out, playing on people's ideals of love is a profitable endeavour. In the 19th century, Valentine's Day cards became mass produced, and the mainstream use of postal services made it a convenient way to express one's affection to their loved ones.

While that explains its relevance in literature and culture, what does it *mean* to us? Was it the way Valentine had enabled others to love, through his secret weddings? Was it the

undying love Saint Valentine had for his principles, to the point of martyrdom? Or, is it a love of money — convenient marketing made to line somebody's pockets?

Or perhaps better yet — what *is* love?

<div align="right">

Pizzadonym

</div>

THE COUNTRY OF SOCCER?

This Sunday (February 11th) Brazil's Soccer National Team lost the match against Argentina in the last round of the Pre-Olympics. With this result, the two-time champion did not qualify for the Paris 2024 Olympics.

It happened while I was watching another soccer match: my soccer team, Internacional, was playing in the state's football league. (They are always my priority, even above the national team.) A match had just ended and, at the bottom of the screen, the score was shown. I didn't think much of it.

A counterattack ended with a kick way past the goal, and it was then that the narrator finally announced that Argentina had won 1–0. I asked what this meant. My brother raised his head slowly and with a serious face explained it to me. In shock, I went to check the official standings and confirmed that he was telling the truth. *What. The. Hell.*

I admit it, this past week I have been terribly busy so I ended up not following the matches very closely. I only watched a few minutes of them when I dragged myself downstairs to have some food (in between working on my long list of assignments) and my brother had the TV on.

But to be honest, I wasn't worried — although now I know I should have been — since, from a very young age, I grew accustomed to always being able to watch my country's national team play. It's even a tradition back home to go to school and watch soccer on match days.

My brother didn't say anything either and he is always going on about soccer, so I assumed everything was fine.

Or maybe I hoped everything was fine because, after everything that happened in the World Cup, thinking about the national team hurt. Soccer always provokes strong feelings in me.

Now, I am just doing my best to cope yet currently miserably falling at it. It never crossed my mind that they weren't going to be there. Who am I supposed to root for now?

<div align="right">

leah

</div>

LINUX

IT IS NOT GOOD ACTUALLY

I grew up hearing tales of how Linux is the best operating system, and how it's used by all the computer gods.

"I'm perfectly happy using [proprietary operating system]," you mumble, and the local god unfurls their scroll of 350 retorts. Not only is Linux better, they say, but they claim your operating system is objectively bad in ways that you're too obtuse to even notice.

"But Linux is scary and confusing!" you mumble. University doesn't really help with that. For most students, the first introduction to Linux is mixed together with Bash terminals and Git and Vim and compilers—a whole world of software tools each named more ridiculously than the last.

"And the GUI looks bad—" you mumble, but the god interjects[1] an overly-technical explanation about Linux distributions. *Linux is just a kernel*, they say. You don't even know what Linux is, so you're not entitled to have an opinion on it.

With little other option, you grit your teeth and make your way through undergrad, surviving a chain of Linux encounters. CS student environments and research clusters. Docker containers and virtual machines and Windows Subsystems. Until some day, you no longer have to Google how to copy a file, and you finally feel entitled to have an opinion about Linux:

it's not that good actually.

A little-advertised perk of being a CS grad student here is that you get a laptop (not to keep, of course) provided by the university. After getting fed up at Microsoft, I asked them to put Linux on it instead of Windows. *I can handle it*, I thought. The machine came fully loaded with default Ubuntu. Great, I could finally run my code on the system that the tech gods intended.

And then it crashed. Not even for any good reason. The graphics sometimes just fails to start when waking up from hibernation, so you're left staring at a blank screen until you force-kill and reboot the entire machine. Thank goodness for open source graphics drivers!

Number of deaths: >40

Middle-clicking in general is a stupid feature, because pressing the scroll button is one finger slip away from scrolling off the very thing you're trying to click on. Sensitive mice also have a bad habit of triggering middle-click by accident. So guess what middle-clicking is bound to? PASTE! When I scroll through a document too quickly it gets splattered with whatever piece of text I had highlighted three windows away. Somehow, many Linux gods think middle-click paste is the best feature ever. The default is so ingrained in the system that the official solution on the Ubuntu Wiki is not to disable the feature (you can't), but rather to disable that mouse button entirely.

Time wasted trying to fix it: 11 hours

Anyways, once you wade your way through all of the dumb quirks of Ubuntu, you can finally move on to installing apps—if they're supported at all. Often times, the Linux version of an app is just a crappy web browser in disguise that loads the app's website instead. For example, if you search "Outlook" you'll find not Outlook, but a small smattering of third-party email clients, each with a rating of 3.x out of 5 because all of them are sitting on a laundry list of unfixed bugs. I don't think a single one supports the authentication method used by uwaterloo.ca, so they're all useless to me.

Failed login attempts: 7

Before the gods shout back with all their various ways to fix these problems, I'd like to remind them that my job is to study and do research. This machine is a tool, not my wife. Writing an article complaining about my problems is *still* faster than learning how to install a different distribution and dealing with the potential consequences of it going wrong on a laptop that I don't own.

(I haven't even mentioned the swap thrashing and the emoji keyboard and the paywall for security updates…)

It's a toxic relationship—no matter how badly Linux fucks up, it's still somehow your fault for not trying hard enough to configure things or code the solution yourself. And when you want to quit, you're pulled back by the thought of all the time you already wasted trying to make things work. They should really make that a warning when you start going down the rabbit hole of Linux:

it's not that good actually.

water

tendstofortytwo has also written a great review of their attempts to get started with Linux, which you can find in **mathNEWS** 141.3.

1. https://stallman-copypasta.github.io/

> # If you look at the kernel, it's 90% drivers, and most of them are absolute crap.
>
> **EMIL TSALAPATIS**

WATER COMES OUT OF THE TAP FOR FREE

Alright it isn't 100% free but it's basically free. In Waterloo, the cost of a cubic metre, which is 1000 litres of water, is $2.32. Since most readers of this publication don't have a strong inclination for math, that's 0.232 cents per litre. At Costco, you can get thirty-five 500 mL bottles of water for $10. That's 57.143 cents per litre.

Somehow, despite this cost discrepancy that overwhelmingly suggests that you should get your water from the tap and not from bottles, I see people lugging home flats of water bottles *all the time.* Every time I do, I lose more faith in humanity.

If you buy bottled water you are stupid and I hate you. I understand it's everyone's right to make poor financial decisions but holy shit you guys are gonna be the cause of a real life Mr. O'Hare from *The Lorax* rising to power and selling bottled air because you are clearly stupid enough to spend real money on something that is basically free if it's sold in a bottle.

The only reason I can imagine that someone wouldn't want to drink the tap water here is because of the composition of the water. First of all, I'd like to say that, if it were unsafe to drink, then they would probably say something. Also, if you become sick from drinking it, you can take the Region of Waterloo to court and get money. There's no losing if you drink tap water.

And if you can't be bothered to participate in a legal battle, just get a fucking Brita! I am also deeply against filtering water pitchers because they are a pain in the ass to refill, but that's another conversation entirely. The Brita thing is also a solution to the cold water argument. Some people like drinking cold water, and I can respect that, but that doesn't necessitate buying bottles and putting them in the fridge when you can just as easily fill a pitcher and put it in the fridge.

There are only two reasons to buy bottled water. The first is so you can do bottle flips, and I think it's safe to say that people are not bottle-flipping in 2024 at the same rate that I see people buying bottled water, although I would love it if bottle-flipping made a comeback. The other reason is to do that thing that I wish I could do but can't where you crush the entire bottle of water and force it down your gullet in half a second.

Let's not forget that water bottles are a massive contributor to the plastics piling up in our landfills and oceans. Yes, recycling exists, but in a lot of cases plastic that's recycled just ends up in the landfill anyway. Wouldn't it be easier to just not have the single-use plastic bottles at all? Maybe if you morons would stop buying plastic bottles we wouldn't have to use paper straws. Perhaps we should replace plastic bottles with stupid paper ones and then nobody would want those, and the plastic straws which were making my drinks significantly better would still be around.

I hope you all develop mineral deficiencies from drinking that dumbass bottled water with none of the delicious stuff that the wonderful Waterloo Region's water system provides to me. I hope your bones crumble and fall apart due to a lack of calcium, while my bones are strong enough to bear the weight of watching you stupid idiots carry home cases of water. I drink the tap water here and I am healthy and full of vigour.

I am the Chad tap water drinker and you are the Beta cuck bottled water drinkers.

Yamnuska

A MESSAGE FROM MATH ORIENTATION

Hey Mathies!

Are you interested in getting… CPR-trained? Perchance… spreading joy like confetti? Helping others earn their Pink Ties? You're in luck: Math Orientation is hiring Coordinators!!

We're looking for:

- Devisors
- Teamsters
- Media Directors
- Choreographers
- Head Tie Guards
- Tie Guards
- Head Pink Ties

Don't miss out on the chance to add some "x"citement to your university experience — apply now and make Mr. Goose proud!

P.S. Applications are due February 26th!

<3 Math O-Team

ADVICE I DON'T HAVE THE GALL TO GIVE IRL
THIS BLOG POST WAS VOTED "MOST EDGY," SO I'M SHARING AS PROMISED

TO THE PERSON WHO FINDS THEMSELF LYING IN SOCIAL SITUATIONS, BUT THEY DON'T WANT TO.

The main reason people lie is because they are trying to maintain an image. Take a look at what sorts of perceptions you're trying to maintain in your relationships. Do you want people to think you're smart, or knowledgable, or funny? Your lies are going to support these perspectives! The best way to solve this problem is to understand that you are who you are right now, and that you can't manipulate people's perceptions as much as you think. The only real way to manipulate their perceptions is to actually *be* a different person.

> *What you are shouts so loudly in my ears I cannot hear what you say.*
>
> Ralph Emerson

TO THE PERSON WHO FINDS THEMSELF BEING MORE RUDE THAN THEY WANT TO.

There's a good chance you are seeing social situations as battles, where you have to get your position up higher and higher, on whatever attribute you've identified as being important. Unfortunately for you, that's not how social situations should work, and that leads to conflicts between parties; one party (you) is trying to "win" while the other party is just trying to have a fun, informative interaction. It's not going to work out, and since this is a deep underlying difference, feelings are probably going to get hurt. The best way to solve this problem is to let go of your desire to always win — and the idea that social situations are a zero sum game along with it — and replace it with a desire to make people happy and to be a good person!

TO THE PERSON WHO FINDS THEMSELF WITH INCREASING DAILY ANXIETY IN THEIR LIFE.

Anxiety is a serious thing, and often there's nothing we can do. But, the following advice is still helpful for people whose anxiety is tied to things they do or don't do, like forgetting to lock a door. If the anxiety is starting to pervade your life, then there is a reason.

> *Behind every emotional problem is an unsolved technical problem.*
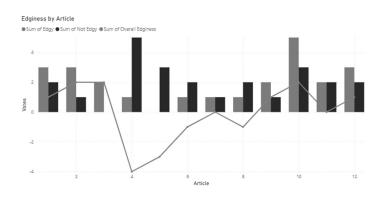>
> A Vedic Monk I met

One factor could be a lack of consistent emotional experience, leading to a lack of self-trust. If you are worried about the door being locked then, essentially, you're anxious because you don't trust yourself to have locked the door. There are many solutions proposed in modern CBT and exposure therapy, but I have one that's worked for me, so here it is: do away with distractions that divert your attention, because then fewer things, small or large, will slip through the cracks.

no pun indented

IRREFUTABLE DATA DEMONSTRATING I'M EDGY

The votes are in. The twenty-three votes on how edgy my personal blog posts are have been analyzed. Here is the data that shows that people think some of my blog posts are edgy, which means I'm edgy. Map (and idea for this article) courtesy of to Not A N*rd's plotting plan and plotted graph.

In fact, I'm not sure why I'm making this article. This was 100% their idea and they did all the work.

Edginess by Article
● Sum of Edgy ● Sum of Not Edgy ● Sum of Overall Edginess

Blog post titles for reference:

1. Rejection Sensitivity Isn't a Thing
2. Why You're Not Interesting to Talk To
3. How to Not make a Difference in the World
4. How to Cure your Narcissism
5. There are No Bad Reasons Why This Title Should Be Clickbait
6. An Explanation for Everything You Hate In The World
7. Two Reasons Why Your One Friend Sucks at Conversations
8. How to Trick Everyone you Know
9. Is Everyone Lying All the Time?
10. Society Discriminates. Accept It.
11. Our Intellectuals have Failed at Life: Why Effective Altruists are Dumb
12. Advice I Don't Have the Gall to Give IRL

no pun indented

OBJECTS FROM THE mathNEWS OFFICE

VI: LETTERS TO mathNEWS

Over the years, it's no surprise that the **mathNEWS** editors have gotten plenty of letters in the mail. Fan mail, messages of unrequited love, hate mail, and so on, to be sure. Lucky for you, I've gained access to the hallowed "Letters to **mathNEWS**" folder of their filing cabinets. Let's read one together:

They're all from Iran. There are about 50 letters, all from Iran, all from the late '90s and early '00s. All of them express a shared interest — in very broken English — in having samples of the magazine/journal "**mathNEWS**" mailed to them for the sake of their mathematical pursuits. *All of the letters are from Iran.* There is no fan mail, no message of unrequited love, and certainly no hate mail. Just an overflowing envelope of nearly identical letters each beginning with "Dear Sir." And, look, I don't want to point any fingers, but almost all of the addresses point to nondescript warehouses on Google Maps.

My guess at what happened is that some folks over in Iran got their hands on Library and Archives Canada's catalogue of "journals" in the '90s and started writing letters to the editors of each "journal." My friend speculates that it might've been an intelligence operation to obtain coveted Western academic research or something. Who can say for sure? In any case, I'm flattered that they consider this publication to be in such high mathematical esteem, but I can't help but fear that some wires got crossed somewhere.

No, there aren't any other letters in the folder. I found some presumably-expired(?) C&D coupons that got mixed in somehow, but that's it. There are a few "real" letters to **mathNEWS**, and they're all pinned up on the wall. And to be honest, I've read them, and they don't make much more sense than the ones from Iran.

With all that being said, next time you're away for that plush co-op in California, consider: what better way is there to spend your excess of disposable income than postage for a letter to **mathNEWS**? Just don't send any letterbombs or anything, OK? I've got enough on my plate and I don't need to get caught up in that sort of thing.

jeff

N THEORIES ON WHAT HAPPENS TO GEESE WHEN THEY DIE

"IT WAS ONE OF THE MOST DISTRESSING THINGS I'VE SEEN IN MY LIFE" — LARS NOOTBAAR

have you ever questioned what happens to a goose when it dies? wonder not. here are some possibilities:

- they are collected and transported by city people to a mass goose burial
- they are collected and transported by city people to a garbage (this one makes me sad)
- their goose friends and family drag their corpse to a goose-regulated grave area
- their body disappears as the goose transcends to the afterlife
- they get EATEN

nike

UNTITLED DOCUMENT

I have made a grave mistake. Some of the people I know are now aware I have written a few articles for **mathNEWS**. While this could easily be dismissed (as the chance of being pinpointed in issues of over thirty pages is small), my writer's name was divulged in an unfortunate turn of events. This is a tragedy since every poorly-written article I have hitherto published (i.e., all of them) is identifiable to me. My options are as follows:

1. Change my pseudonym. However, I'm quite fond of this name since it's in every article since **mathNEWS** 153.1, for anything I have written.
2. Indirectly call out these people in a formerly subtle editorial.

Anyway, I must keep this short lest it be too eye-catching.

Whole Number Haver

N GROUPS OF M ANIME CHARACTERS THAT ARE VOICED BY THE SAME JAPANESE VOICE ACTORS

- Yotsuba from *Quintessential Quintuplets,* Fiona from *Spy x Family,* Gabi from *Attack on Titan,* and Yae Miko from *Genshin Impact.* (All voiced by Ayane Sakura)
- Levi Ackerman from *Attack on Titan,* Saiki from *The Disastrous Life of Saiki K,* Ego from *Blue Lock,* and Neuvillette from *Genshin Impact.* (All voiced by Hiroshi Kamiya)
- Anya Forger from *Spy x Family,* Vivy from *Vivy: Fluorite Eye's Song,* Rio Futaba from *Bunny Girl Senpai,* and Frieren from *Frieren: Beyond Journey's End.* (All voiced by Atsumi Tanezaki)
- Tanya from *Tanya the Evil,* Madoka from *Madoka Magica,* Tatsumaki from *One Punch Man,* Maomao from *The Apothecary Diaries,* and The Traveller from *Genshin Impact.* (All voiced by Aoi Yuuki)
- Emilia from *Re:Zero,* Megumin from *Konosuba,* Ai Hoshino from *Oshi No Ko,* Tomo Aizawa from *Tomo-chan is a Girl! (can you believe that!?)* and Hu Tao from *Genshin Impact.* (All voiced by Rie Takahashi)

- Tanjiro from *Demon Slayer,* Ken from *Tokyo Ghoul,* Falco from *Attack on Titan, and* Arima Kosei from *Your Lie in April.* (All voiced by Natsuki Hanae)
- Kirito from *Sword Art Online,* Inosuke from *Demon Slayer,* Sora from *No game, No life,* Petelgeuse from *Re:Zero,* and The Pig from *The story of a Man who turned into a Pig.* (lmao) (All voiced by Yoshitsugu Matsuoka)
- Yor from *Spy x Family,* Jabami Yumeko from *Kakegurui,* Shinobu from *Demon Slayer,* Shoko from *A Silent Voice* and Ayaka from *Genshin Impact.* (All voiced by Saori Hayami)
- Naruto from *Naruto,* Gon from *Hunter × Hunter,* and Red from *Pokemon.* (All voiced by Junko Takeuchi)
- Himeno from *Chainsaw Man,* Killua from *Hunter × Hunter,* Ray from *The Promised Neverland,* and Reg from *Made in Abyss.* (All voiced by Mariya Ise)
- Mikasa Ackerman from *Attack on Titan,* Violet from *Violet Evergarden,* 2B from *Nier: Automata,* and Stella From *Honkai: Star Rail.* (All voiced by Yui Ishikawa)

Lupical

UNTITLED POEM 0

I'm eighteen with my back to my leather jacket to the
space between the ION crossing at Waterloo Park—
the southern one, by the water.
The dark is unassuming, with a rougher voice, a face
not as blinding, and freckled with stars.
She is whole in herself, and uncontained,
and I am barely my container,
a sight that does not fill the skin and
an eye that cannot read the constellations
spelling out my fate.

I wish I could prove the sun will rise forever:
if it rises today it will rise tomorrow,
if it rose, once.
I wish I could find the infinity I cannot map my infinity to;
I wish I could prove how the irrational consumes the rational
to my mother,
when she's scared of losing me to who I am.

To whom I love:

Red lights and candy cane stripes.
I left the asphalt; I'm twenty now.
The grey still bites, but no more than the cold.
No matter what, I promise I'm coming home.

tomatoes

FASS WINTER 2024 REVIEW

Disclaimer: FASS had zero editorial power over this article and I am not being paid by anyone to write this.

There is a local theater group loosely associated with the University of Waterloo called FASS, which stands for Faculty, Alumni, Staff, and Students. They give a role to everyone who auditions and make a new musical every term in a month or less.

As such, FASS productions are an experience. They start by getting the audience to do funny poses while singing the song "Singing In The Rain" so you can tell it's not normal.

In terms of quality, it's surprisingly good. There were some lines that were stuttered out, but honestly that wasn't much of an issue from my perspective. The props were also low-budget but convincing enough. I'm not going to criticise a production for something that is not its goal, but I must say that I was not disappointed by the quality. The costumes were quite good.

The music was great. They had a band to perform almost everything live. All the songs were parodies of pre-existing songs, so the songs were strong. The lyrics were also quite good. I am quite picky when it comes to lyrical aesthetics, but it was more than decent.

The story was all over the place, as one would expect with something written in less a month to include exactly the number of people who auditioned. I'm not going to say it was good. However, I will say it was *fun*. The point of this is not to have a good story, but to be a good time. And boy. was it a good time. It took a while for me to get in the mood, so I only really got into it in scene 4 of 6. But from that point on, it was the best thing I've ever seen.

Finally, I will do a scene-by-scene one-sentence review of the production.

SCENE 1: COUNCIL OF EVIL

A slightly rough start that set up the rest very well.

SCENE 2: TROUBLESOME CO-OPS

Definitely the most grounded of all the scenes, being too accurate to real life.

SCENE 3: NOTHING'S GOING ON HERE....

An alright scene and I have nothing to say.

SCENE 4: WOMBATMAN

Imagine if Batman built walls of poop and destroyed public infrastructure.

SCENE 5: ACCIDENTALLY LEARNED STUFF

A completely self-contained heist story that could have worked on its own.

SCENE 6: SPASEX

A bit sexual for what I like, but it was unironically (and non-vacuously) the best BL I've seen in the last 3 months. (Also the best scene here.)

In conclusion, this musical was a great time and you should go. It's funnier than almost anything professionally made and clearly had a lot of love put into it.

<div align="right">別</div>

DISINTEGRATION BY PARTS

In your Calculus 2, you may have proved a theorem (proving the integration by parts formula) that goes something as follows:

Let f and g be such that f' and g' are continuous on an interval containing a and b. Then

$$\int_a^b f(x)g'(x)dx = f(x)g(x)|_a^b - \int_a^b f'(x)g(x)dx$$

In this article, the integration by parts formula will be disproved by contradiction.

Proof:

Assume the integration by parts formula is valid.

Consider the following integral:

$$\int \frac{1}{f}\frac{df}{dx}dx$$

Applying integration by parts we get:

$$\int \frac{1}{f}\frac{df}{dx}dx = \frac{1}{f}f - \int f\frac{-1}{f^2}\frac{df}{dx}dx$$
$$= 1 + \int \frac{1}{f}\frac{df}{dx}dx$$
$$0 = 1$$

<div align="right">*a_very_true_prover*</div>

N RESPONSES TO "HAPPY CHINESE (LUNAR) NEW YEAR"
IN ORDER OF INCREASING CONCERN

- Happy New Year to you too!
- yay new year woo
- 新年快乐！(Happy New Year)
- 新年快樂！(The one above but in traditional Chinese)
- 新年快乐这隆重的甲辰龙年，祝您万事如意、大吉大利，身体健康、龙马精神！(Happy New Year. In this grand Year of the Dragon, I wish you all the best, good luck, good health and the spirit of the dragon and horse.)
- 新年快樂！這隆重的甲辰龍年，祝您萬事如意、大吉大利，身體健康、龍馬精神！(The one above but in traditional Chinese)
- dragons more like dragon deez nuts
- rawr
- dragons more like dragon deez nuts all over your face
- rawr uwu
- dragons more like dragon deez nuts all over your face lmao dab get rekt fam
- rawr uwu :3
- is it whitewashing if me, an Asian, prefers the style of Western dragons over Eastern ones?
- why do we even have a dragon in the Chinese zodiac, and why did it lose a race against a rat and an ox?
- this is secretly communist propoganda wake up sheeple
- i love how americans will look at this and say this is a psyop then go watch the superbowl the very next day — awED
- I like [insert any other of the 11 zodiac here] more
- Dragons are lame!!!111!!11!!11
- xinniankuaile[gantanhao]
- YDHML OQ PDK VID! YYMR NHLEM HJWG HAPI WL MMMV YBYSP OQ，IFHRU OFP TWLB JLLN VR VTAP、K GR K HDLN，HXH BBTWT ONKQ ILE、YBYSP SQSF FDQMB IFLWL! (10 cool points to whoever figures out what this is)

andoiii

ON NAMES

I had a great idea.

Recently, my student society launched candygrams. They're pretty basic — just tags of urban planning jokes printed and taped around lollipop sticks. (It's no secret I'm not of the Math Faculty.) Of course, I wanted mine to stand out from the other cohorts — it's my last semester! Why not end things off with a bang and personalize each and every one of them? I have a class list of everyone who would be attending the class where they would be handed out, so that's about less than 150 (Official Count: 133, minus the two test students). I've written more words trying to notate the nuances of housing issues in Canada. What could go wrong?

Turns out, a lot.

The following text exchange happens between me and my friend, Reasonable Voice (RV).

Me: hey what if i wrote EVERYONE's name on the Valentine candygrams

RV: That's a little absurd

Me: when have i not been absurd, it's just <120 names

RV: Bruh

Me: I see no way this can go wrong!

Cut to — many things going wrong. First off: I can't guarantee everyone will be in attendance. Second off: what if I miss someone?? Third off: HOW AM I GOING TO HAND THESE OUT?! Not only is this in a lecture hall of 130 people, I'm going to have to hand these out to literally everyone. I could organize by name, but no one sits by name. I could organize by friend group, seeing as my cohort is basically high school all over again with how cliquey it is, but I can't exactly sort by that on a Learn Classlist. And that's assuming all 130 are going to be in attendance in the first place!

I write and write and write. My hands cramp and by the fiftieth name, I'm already getting cramps. Why am I rushing?? There's plenty of time before the class. Half these people I either don't recognize the name or face of. I'm in infinite pain. Release my suffering.

Why did I think this was a great idea?

Skit

MATH SNEW47
A GLIMPSE INTO THE MIND OF SOMEONE WHO DEFINITELY ISN'T LOSING IT

I was at a basketball game last Saturday, in my usual capacity as a trombonist with the Warriors band. It was pretty great, actually — our team sank a buzzer beater right at the end of the fourth period to tie the score and then went into overtime and proceeded to win 73–68 against Windsor. But in spite of how captivating the game was, there was a certain question that I couldn't stop thinking to myself:

"Do you think you're the only person here thinking about Cauchy sequences in $\mathbb{R}^\infty$?"

You see, I am one of exactly 10 students who have the distinct honour of being in the current offering of MATH 247, Advanced Calculus III, with none other than Professor Stephen New. Many an analysis enjoyer will come to this school and take MATH 247 at some point in their journey, but few will experience the rare celestial event that is MATH Snew47™. For all I know, it may never happen again.

Perhaps you're wondering what's so special about this *Snew* character. While some professors have slides and some others have lecture notes they refer to, Snew goes against the grain by showing up to class empty-handed, simply knowing all of mathematics, and saying stuff. Sometimes he even writes it down on the chalkboard. You may think you know what I'm talking about if you're in his offerings of PMATH 340 or 333, but due to their larger sizes, there's a good chance that Snew is only using 10% of his true power there. The intimate confines of 247 are where he is truly in his element — like Plato at his Academy, our lectures are simply erudite discussions about calculus, topology and, occasionally, the foundations of mathematics.

So, what do basketball and Cauchy sequences in $\mathbb{R}^\infty$ have to do this? Well, Stephen New is a man who likes many things. Among them are coffee, triangles, teaching, travel, and making hard assignments. *Really* hard assignments. We're given two weeks to do them, and I usually need almost all of it. Even with the four other math and computer science courses I have this term, the assignments for this one alone are single-handedly taking up at least 65% of my free time on the weekends. If working through them means scouring Wikipedia articles for better intuition about compactness, making a bunch of Desmos plots to figure out how small of an open ball to take, and spending every waking moment contemplating how a Cauchy sequence can fail to converge in infinite dimensions, then so be it.

For better or for worse, this course has changed the way I engage with math. Which is to say that I engage with it a lot more, because I have to if I want to finish this assignment early enough to have time to review for the CS 251 midterm. (If you're reading this on the day it comes out, that midterm was yesterday. I hope it went well.) But I think that's a good thing — the point of studying mathematics, for me, is to be able to use mathematical concepts and modes of thought to solve different kinds of problems, and the more I read and think about math, the more I can see the connections between its different areas. Beyond that, there's a kind of satisfaction you get from finally triumphing over a difficult problem that's hard to find elsewhere. As Richard Rusczyk of AoPS fame once wrote, "Brilliant 'Aha!' moments almost always spring from minds cultivated by long periods of frustration. But without that frustration, those brilliant ideas never arise."

Or maybe I have Stockholm syndrome. Who knows?

yalevoylian

I AM BAD AT MAKING CONVERSATION, BUT COULD NOT POSSIBLY HAVE CHOSEN TO BE THIS WAY

Starting my coop job this term has brought more of my attention than ever before to how incompetent I am at making conversation with people. I cannot, for the fucking life of me, just "chat" with someone who I don't know. The only way that I've talked to people at this job is if they absolutely carry the conversation, either by talking at me a bunch or by asking me questions so that I have almost no agency as to how i respond.

It's unbelievably hard to come up with things to say to people, which is crazy because I see everyone doing it constantly, I just have no idea how to do it. One day when I was reading a philosophy textbook my boss gave me a pdf file of on my first day, I realized that I find philosophy interesting, and maybe should ask people about it when I don't know what to say. This is how i discovered the incredible new socializing tech: "do you believe in free will?"

Anyone who has dabbled in philosophy will understand the question and we'll have a conversation about their take on it, which is fucking awesome, and anyone who hasn't will think I'm deranged, but I can explain arguments for both sides and see what they think. Either way, I can actually feel like I'm contributing to a conversation (even if I do so by derailing it), and the topic often leads into other interesting discussions.

Unfortunately I can only ask someone this question once, so it's kind of a band-aid solution. Oh wait i think i was gonna say an argument against free will in this article so the title would make more sense. I'm tired tho fuck it I'll do that next issue
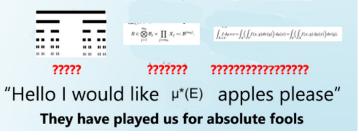
nazz

PMATH 451 LIVE REACTION

MnO4

N GROUPS OF M ANIME CHARACTERS THAT ARE VOICED BY THE SAME ENGLISH VOICE ACTORS

- Miyuki Shirogane, Senku Ishigami, Alphonse Elric, Yasuchika Haninozuka, Twelve, Hibike Lates. (Aaron Dismuke)
- Yu Nishinoya, Bido, Kaoru Hitachiin, Leo Kakinoki, Kaoru Yamazaki, Koji Koda, Ganta Igarashi, Ayato Naoi, Youhei Sunohara. (All voiced by Greg Ayres)
- Mikoto Misaka, Camie Utsushimi, Hitch Dreyse, Ryou Fujibayashi, and Yuri Nakamura. (Brittney Karbowski)
- Lelouch vi Britannia, Vash the Stampede, Ichigo Kurosaki, Genma Shiranui, and Yusaku Kitamura. (Johnny Yong Bosch)
- Okabe Rintarou, Erwin Smith, Kraft Lawrence, Kyoya Otori, Shuu Tsukiyama, Vincent van Gogh from *JJBA Stone Ocean*. (J Michael Tatum)
- Kiriya Ubuyashiki, Madoka Kaname, Shiemi Moriyama, Minori Kushieda, Erica Brown, The Poplins from *Super Mario Bros Wonder*. (Christine Marie Cabanos)

yalevoylian

N THINGS TO DO IN SASKATOON

- Try to go to a well rated restaurant. It is busy ☹ Go to a fancy steakhouse instead and get chicken.
- Have the nicest hotel breakfast of my life! It has 2 separate toppings bars: one for eggs and one for yogurt.
- Visit the Canadian Light Source (CLS). It is a particle accelerator in Saskatoon. Specifically, it's called a Synchrotron which is the same type of accelerator as CERN, but much smaller.
- Spend 16 hours at the CLS because you are on a work trip ;-;
- Play with liquid nitrogen!
- Go to Olive Garden for lunch.
- Apologize to East Side Marios for your hatred of them. It turns out Olive Garden is so much worse.
- Try to eat your cold Olive Garden with coffee stir sticks because you don't have utensils.
- Go on a Utensil Quest TM to the lunchroom to get a fork.
- Have an okay latte from the machine they have in the CLS lunch room.
- Sleep for 6 hours.
- Spend 8 more hours at the CLS.
- Slowly go mad.
- Get Banh Mi for lunch!

- Contemplate spending your incredibly necessary four hour nap break to go to a sports bar and watch the superbowl.
- Have the nap. It was perfect and I hate sports.
- Get woken up halfway through your nap by someone delivering wine.
- It's not for you. Its for someone at the hotel with the same room number as you. Because the hotel that you are at is actually TWO hotels. In the same building. With the same room number. OWNED BY THE SAME PARENT COMPANY.
- Go back to the CLS for 4 more hours.
- Make friends with the dead bug on top of the cryostat <3 *Bestie* <3
- Sleep for 5 hours,
- Go back to the CLS for 2 more hours to clean up.
- Get CLS merch.
- I spent 30 hours at the CLS and all I got was this really cool shirt.
- Go to the aforementioned sports bar for lunch.
- Write article in taxi back from the airport to prod night.

I'm so tired goodnight <3

rockfacts

WHY IS PI IRRATIONAL?

Many of you may know that π is an irrational number, but can you justify this?

This was a claim first proved by Lambert (I think), but he used some continued fraction nonsense. This article will show a simple(r) proof. (I don't know whose proof this is but maybe someone important.)

It goes as follows:

Assume, towards a contradiction, that there exist positive integers a, b such that π = a/b.

Define the following:

$$f(x) = \frac{x^n(a - bx)^n}{n!}$$
$$F(x) = f(x) - f^{(2)}(x) + f^{(4)}(x) - \cdots + (-1)^n f^{(2n)}(x)$$

for some positive integer n.

Consider multiplying f(x) by n!. This product is a polynomial with integer coefficients and all terms have degrees greater than or equal to n.

As such, f(x) and all of its derivatives have integer values when evaluated at x = 0.

Also, given that f(x) = f(π-x), the same holds. So for x = π,

$$\frac{d}{dx}[F'(x)\sin(x) - F(x)\cos(x)] = F''(x)\sin(x) + F(x)\sin(x)$$
$$= f(x)\sin(x)$$

Also,

$$\int_0^\pi f(x)\sin(x)dx = (F'(x)\sin(x) - F(x)\cos(x))|_0^\pi$$
$$= F(\pi) + F(0) \in \mathbb{Z}.$$

From the above, we know that

$$F(\pi) + F(0) \in \mathbb{Z}$$

Notice the following:

$$0 < f(x)sin(x) < \frac{\pi^n a^n}{n!}, x \in (0, \pi).$$

This induces a contradiction, which is left as an exercise to the reader.

a_false_prover

N READINGS FROM MY ENGLISH LIT CLASS

- lab rat pleads for its life using heartfelt appeals for understanding and empathy
- crazy man lives by a cliff, but does he even exist?
- farmer apologizes for destroying mouse's little house
- twist on Christian mythology but made confusing as hell
- a love so strong that it filled the angels with jealousy
- grieving while listening to (mythical?) bird's song, but was it real or only a dream?
- trying to reason the unreasonable, and almost getting killed in the process
- fully grown man can't deal with little girl's perception of death being different than his

leah

LICKING THE LIBERTY BELL

like taking shoes off after a long day
like a rest day after five days of gym
like waking up on sunday morning at 2 PM
like peeing after a road trip
like listening to stairway to heaven after 2 full days
like walking out of the MATH 148 final after leaving it half empty
like catching the bus you thought you'll miss for sure
~~like stabbing that one noisy child on the flight~~
like writing QED after proving "all cyclotomic polynomials are irreducible over $\mathbb{Z}$"
that's how dropping PD 11 felt
like licking the liberty bell
(you know, because the taste of liberty)

0.423

A SHORTER NAME FOR MEXICAN COKE

We all love Mexican Coke; it's objectively better than Canadian and American Coke. We usually default to "Coke" when we are referring to Canadian and American Coke, and specify "Mexican Coke" when we aren't. I think you see the problem: that's too long of a phrase. Think about it, it's a 4-syllable-phrase. Who even has time for that? In this economy?

So, I've been cooking recently, just to think of a better, shorter name for our Lord and Savior, Mexican Coke. I drew inspiration from how the main distinction between regular Coke and Mexican Coke is that the latter is made out of cane sugar instead of corn syrup. Hence, I propose the new name for Mexican Coke: *Coke Cane*™

-rwxr-xr--

> # I want to defeat you.
> PROF. JASON BELL

N PIECES OF HUMBLING ARCHITECTURE AROUND CAMPUS

- the mc/dc bridge's water fountain
- chem 2 water fountains
- cracks in bathroom stall doors
- the dc automatically sliding door that opens a second too late after sensing you
- desk outlets that don't work
- Porcellino
- classrooms with the door at the front of the room. Excuse me walking in five minutes late to (a) squeeze behind the prof with my massive backpack, (b) cast my shadow across the projector screen while I search for a seat and (c) sit down in what just happens to be the squeakiest chair on campus
- the m&m machines recording my lustful gaze as I pass by
- the dripping brown stain on the lecture hall wall in RCH
- big staircases that expose anemia
- all of PAS
- the entrance to the tunnels I found that's too small for me to fit through

nike

HOW TO NO DAMAGE CHEESE DMD/HAH M19 (VERGIL)

1. Have at least 150,000 dollars.
2. Equip DSD and Faust, then spam trickster dash to avoid all his attacks.
3. Wait for him to do a combo B (it's usually the string where he teleports right next to you).
4. Immediately dash away and start charging red hot night (lock on + forward + gun style button).
5. If he does anything other than teleport away and shoot summoned swords, cancel with guard (RG style) and wait for another combo B.
6. When he starts shooting summoned swords, use DT and switch to gun style (the summoned swords will block his).
7. 100–0 him.

warrior1rules

DEAR KARACHI

Dear Karachi,

I have visited four of your gas stations, three of your gardens, two of your mosques and one of your homes.

I have broken a dozen of your gullaks and nearly drowned in your sea. I have sang in your narrow streets and tasted your rain. I have sat in your silent nights, dripping sweat, three dead mosquitoes on my palm. Your cats are safe with me. I will feed your dogs and care for your year-round blossoms. I will nurse your dying birds. I will buy every peach from your street vendors and I will carry your call to prayer with me.

I will love you in the way a child loves their absent mother. You gave birth to me, but I left your arms at seven. I visit during winter break, and for a moment it feels like I never left. In the warmth of your embrace, you are family. You are my home. And yet, when it's time to leave, I tell myself it's for the best. I wish you knew me as much as I know you.

One day, when I'm older and you're dying, I will come back and take your hand into mine. I will recite a short prayer and assure you I have forgiven you.

I will not attend your funeral.

So before that happens,

Please, have me. Call me home.

Moon

N HAIKUS FOR YOU

BUTTERFLIES 🦋

Those fluttering wings
name of my sanitizer
such beautiful things

STUDYING IN SUMMER

Going to campus
shining sun in the summer
waiting for the bus

HAIKUS ARE LIKE ME

Haikus are like me
low maintenance and chill vibes
not for everyone

RAIN

I look up and see
shimmering raindrops gently
falling from the sky

PASTA

I like to eat food
my favourite dish is pasta
so many options

[insert pen name here]

KING STREET MARCH

you are here, but you are in your head,
plotting bitterness calculus,
posing sour, unheard things.

each step we can see announces
the tick of your secret motor,
looking cold, running hot

composing lines in sand, those fractal coastlines
mutating themselves to survive,
moral gerrymandering, mental compromise.

shed it now like a childhood snow coat,
bare what you've neglected to the warmth.

rub, press, hold, feel, take, share, squeeze.

there are good things to be considered too,
and kinder ways to go on living.

hotfemoid

SOME VALENTINE'S DAY STATISTICS

Those who have wished me for V day:

- Supercell (for Hay Day)
- KFC
- Porter Airlines
- W Store
- Supercell (for Clash Royale)
- Doordash
- Instacart
- Uber
- Cineplex
- Popeyes
- Apple
- WUSA
- Some random AI company
- Laurier Computer Science (???)

Those who have not:

- Real people

0.423

HAPPY VALENTINE'S DAY

wax

RANKING THE NAMES OF HEAVY METAL SUBGENRES BASED ON HOW UNHINGED THEY ARE

1. Pornogrind (do I need to explain?)
2. National Socialist Black Metal (eq)
3. Italian Occult Psychadelia
4. Unblack Metal (Christian Black Metal)
5. Kawaii Metal
6. Mathcore (so me!!!)
7. Neue Deutsche Härte
8. Baroque Pop (these just don't belong together?)
9. Florida Death Metal (knowing Florida, this is probably unhinged)
10. Midwest Emo (the name isn't actually that unhinged but the MUSIC)
11. Wizard rock (Harry Potter fans rejoice)

Battlestar Galacticumguzzler

CODEY IF THE CSC WEREN'T ALL COWARDS

hyperlynx

FAVOURITE NUMBERS

Here are the favourite numbers of the writers of **mathNEWS**:

- 0 (2)
- 1
- 2 (2)
- 3
- π
- 4
- 5 (2)
- 7 (2)
- 8 (3)
- 9
- 13 (3)
- 24 (2)
- 27 (2)
- 42
- 666
- 2520

mathgeek

N UNDERRATED HIDDEN GEM STUDY SPOTS ON CAMPUS

- SLC after 6 pm
- MC basement
- DC beside the washrooms
- Outside during winter term
- E7 6th floor
- PAC basketball court
- CIF ice rink
- V1 game room
- CMH cafeteria
- SLC tims: group study with the rats
- Group study with the rats II: DC group study
- RCH basement
- The tunnels between RCH and DWE

three generous upper-year students

To misquote Bertrand Russell, "I would advise you not to follow this advice."

PROF. KEVIN HARE

GRIDWORD

SQUEEB (gridWORD)

gridCOMMENT *154.3*

hello to the gamers,

new **gridWORD**!!!! this time in the theme of **gal**entines day!! ;0000

last time, i asked "what are your valentines day plans?" and you all responded:

- mobpsychofan: *who want me*
- Lars Nootbaar, aphf, and peacelovemath: *Grad House trivia*
- yourbloodyvalentine: *going to a concert by myself*
- Coda (with special thanks to GG): *Leetcode and chill with Mr. Goose*
- FRED: *Econ 101 Midterm*
- Manfred, butler of Bryce Dwayne: *To go rock climbing cause my girlfriend is on a coop term and in Toronto*
- DeceptionGBclub: no response 🫠
- awmlet: *denouncing corporate holidays under consumerism*

- denko: *having my boyfriend for dinner (he is a lobster)*

denko, that sounds like a lovely plan, and i'm sure your boyfriend is tasty, but please use your prize of a $5 cnd gift card to get a donut or something instead (my treat!!!!!!) come by the **mathNEWS** office in MC 3030 or email <u>mathnews@gmail.com</u> to collect :)))))

i am once again announcing how proud i am of u all, it is always wonderful seeing so many awesome gridWORDers every two weeks :oooo

this time, i ask you, "who is your favourite musical artist?" please send **gridWORD** solution along with **gridQUESTION** answer and your pseudonym to <u>mathnews@gmail.com</u> by feburary 26th at 6pm.

bye !!!!!!!!!!! :)))))))

Wink wonk

ACROSS

1. Go over and over and over
7. Double standard?
10. Norway's capital
14. Means of access
15. Chance
16. Declare openly
17. Legal assistant*
19. Chopped down
20. Altar vow
21. Pizazz
22. Gloomy
23. Born, in bios
24. Pack animal
25. "It's no ___!"
27. Gunk
30. Formerly, formerly
32. Stationed
34. King Kong, e.g.
35. German sub
38. Pistol-packing pacer
40. Situated between two or more galaxies*
43. Excite
44. Sheets and stuff
45. Romanian money unit
46. Home Depot purchases
48. Boosts
52. An end to sex?
53. Sixth sense, for short
54. Average
57. Caribbean, e.g.
58. Conclude
60. Overweight
62. Cereal grain
63. Blue potion
65. To a wasteful degree*
67. "C'est la vie"
68. Broke bread
69. Common allergen
70. Apple variety*
71. Neighbor of Swed.
72. Respect them

DOWN

1. Pillage and plunder
2. Dodger
3. Medal winners
4. de Armas, of Blade Runner fame
5. Infection fighter
6. Ends of bread
7. Bangkok native
8. Bewhiskered beast
9. Photo ___
10. Home to Honolulu
11. Hypnotist of fiction
12. Fan setting
13. Hold title to
18. Chatterbox
22. Figure out
26. Roomy vehicle
28. Oil cartel
29. "___ the fields we go"
31. Ballet attire
33. Ever
36. Beat
37. Nabisco cookies
39. 11,000-foot Italian peak
40. Angers
41. Knowledge posited as an object that exists independently of human sense
42. Used "th" in place of "s"
43. Muhammad ___
47. Portuguese port
49. King Mark's bride
50. Vegas employee
51. Lecherous goat-men
55. Comment to the audience
56. À la king?
59. Astronaut's insignia
61. Afrikaner
63. Kind of wheel
64. ___ mode
65. Kitchen item
66. "Go on…"

CRIDXWORD

lookAHEAD

MATH ENDOWMENT FUND NEWS

FUNDING COUNCIL APPLICATIONS

Want to make a meaningful impact on the UW Math Faculty? Apply to the MEF Funding Council! The position involves listening to proposal presentations and discussing how to allocate funding between all proposals. Applications are open until Friday, February 23rd, at 11:59 PM. The application form can be found at https://uwaterloo.ca/mef/funding-council-0. Not yet convinced to apply? What if we told you that dinner will be provided… for all meetings!

PROJECT FUNDING PROPOSALS

Need funding for an idea that will benefit undergraduate UW Math students? Apply for MEF Project Funding! This term, we have over $137,000 available for allocation. Proposals are due by Friday, March 1st, at 11:59 PM. The application form can be found at https://uwaterloo.ca/mef/funding-grants/project-funding.

EXECUTIVE DIRECTOR & BOARD OF DIRECTORS APPLICATIONS

Interested in improving the overall student experience for UW Math students? Apply for the position of Executive Director for the Spring 2024 term! The Executive Director is responsible for processing reimbursements of granted funding, organizing Funding Council meetings, communicating with project organizers, and much more! Applications will be open from Monday, February 19th, to Sunday, March 10th, at 11:59 PM. Applications for MEF Board of Directors will also be open during that time. The application forms will be available at https://uwaterloo.ca/mef/board-directors.

Mathematics Endowment Fund (MEF)

LAST ISSUE'S gridSOLUTION