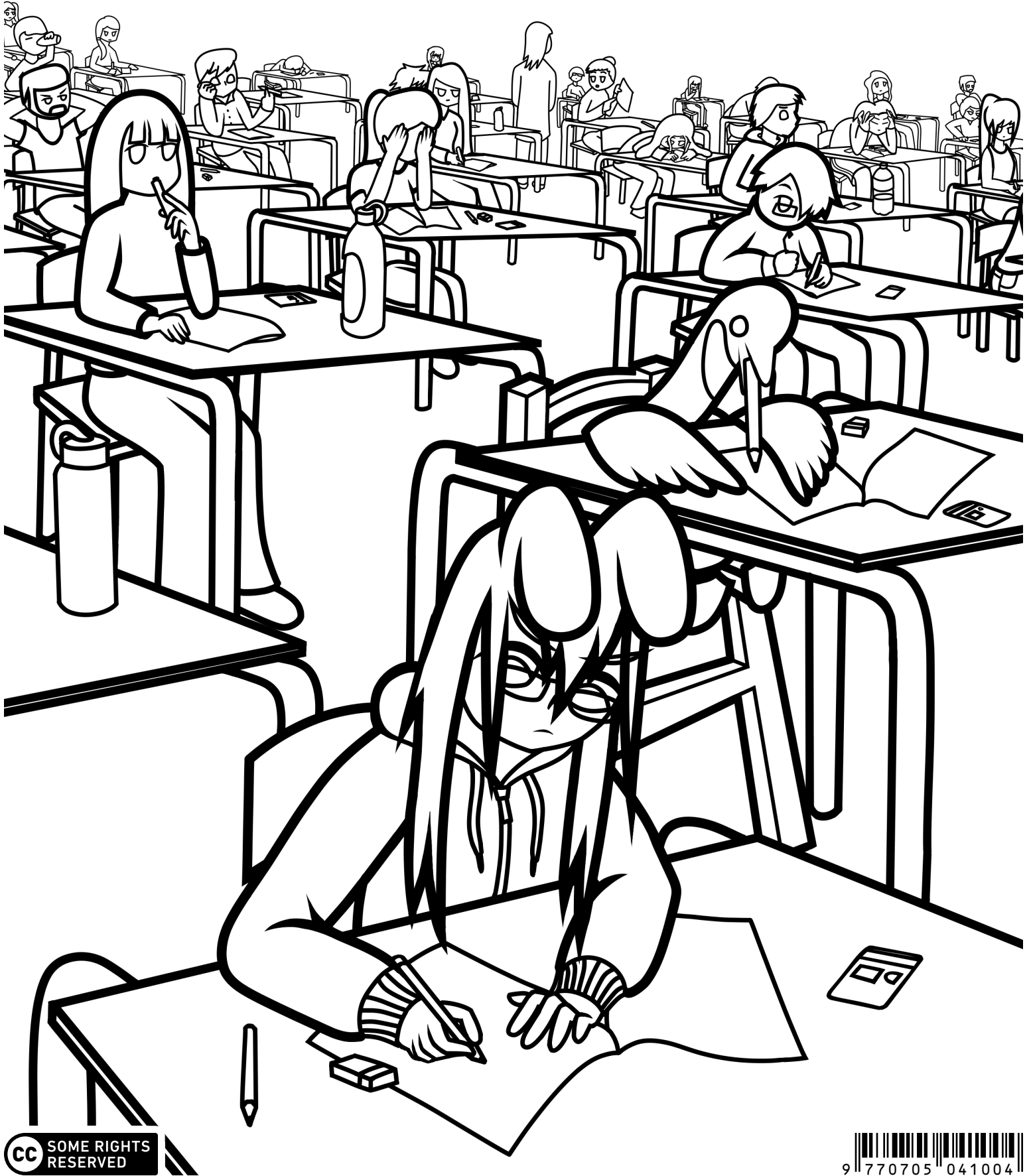


snowdozer



## “IT’S A SNOW DAY! WHAT SNOW ITEM/STRUCTURE ARE YOU BUILDING?”

Happy December, my loveliest readers!

Well, it’s November as I write this **mastHEAD**, but given that this issue comes out on December 1<sup>st</sup>, you can’t possibly be reading this before then. As we know, **mathNEWS** issues appear out of thin air, as if by magic, precisely at midnight on the Friday of each Production Week. Rumors of readers picking up copies on late Thursday night are, of course, false.

*(clears throat)* Anyway! We have another fantastic issue lined up for you all, and it’s a fantastic time to read it as well. My favorite way to read **mathNEWS** has always been to go to Williams/Tims/my kitchen/any other establishment that serves hot coffee and has a seat right next to a window, grab said coffee and said seat, and sip coffee, turn page, sip coffee, turn page... all while the winter snow falls over unsuspecting cars. Sounds delightful, doesn’t it? I urge you to try it as well.

Anyway, as I flip through this issue on the upcoming weekend, I expect to find gems like:

- return of the “what your major says about you” article format,
- Avatar: The Last Airbender fanfiction (pogging rn),
- plans for world peace,

and much more. It’s gonna be awesome, enjoy!

caffeinatED  
Editor, **mathNEWS**

## ARTICLE OF THE ISSUE

In these difficult times, it is important for us to stand by our friends, our families, and ~~our megacorps~~ Our Independent Grocers. And that’s why Somebody Hurt My Independent Grocer by h is the Article Of This Issue.

Drop by at MC 3030 to collect your Conestoga Mall gift card whenever you want!

caffeinatED  
Editor, **mathNEWS**

WINK WONK	yellow snow
ANDOIII	The Snow Tower of Babel
BOLDBLAZER	<i>looks outside window and sees Vancouver</i>
FINEGEOMETER	The trivial sculpture, consisting of zero snow.
NOT A N*RD	Snow biblically accurate angels
JEFF	Snow <b>mathNEWS</b> issue (the cover is yellow)
AMIRDADP	You mean it’s a SNEW day?
SEXY_SOFTWARE_BABE	a better sleep schedule (it will melt away tomorrow)
NAZZ	snowpen ball
YET ANOTHER WATERLOO GOOSE	snow armchair (100% genuine leather)
HYPERLYNX	A snow empty set
YALEVOYLIAN	A snowpen ball
TENDSTOFORTYTWO	fried snow
SOMEBODY	Trebuchet
SNOWDOZER	A dozer
MOLASSES	all of the nazca lines
SHAHABEE	I’m going to make a hole and sit in it
POPCORN ROCK EATER <3	AOMGUS !!!!!!!!!!!!!!!!!!!!!!!
APHF	The Library of Alexandria. Good luck burning it down this time, Theophilus
DICK SMITHERS	I’m imitating the February 18, 1992 strip of Calvin and Hobbes
BLINCHIK	a lil snow slide through a snow tunnel
CHERRY ♡	a lump designed to look like a human buried under snow
RAPIDEYEMOVEMENT	Statues of the editors
MATHGEEK	Snowballs, lots of them. Maybe a tiny snowman
UW UNPRINT	Snow Great Wall of Snow China
WATER	ice
COMMONDIYAR	Cube
LARS NOOTBAAR	The 3 Gorges Dam
AWED	Pizza Nova pizza box (with none pizza inside!)
CAFFEINATED	snowed coffee (like iced coffee but using snow instead of ice)
DISTRACTED	hilltop snow tunnel to sled through before going down the hill (at my elementary school)
CLASSIFIED	a snow fortress

# What? No, I don’t have time to do the blackBOX.

EVAN GIRARDIN, **mathNEWS** EDITOR FOR FALL 2023  
ALONG WITH DANIEL MATLIN, AWAB QURESHI, NAMAN SOOD, AND ISABELA SOUZA

# mathASKS 153.6

FEATURING PROFESSOR RAHIM MOOSA

**JEFF: I KNOW JUST ENOUGH FIRST-ORDER LOGIC TO GET BY. WHAT'S MODEL THEORY, AND WHAT DOES YOUR WORK IN IT FOCUS ON?**

Model theory is a branch of mathematical logic. I think of it as an approach to mathematics, a way of doing mathematics. The idea is that you fix a class of structures you are interested in studying (integral domains, say, or complex varieties), and then you fix a formal language in which to study them, restricting thereby what you can say about these structures. The constrained formalism allows you to apply the intuitions and techniques from logic. It is surprising how far this can take you. My own work focuses on applications to algebraic geometry.

**NO PUN INDENTED: WHO IS YOUR FAVOURITE MODEL?**

Oh, I'm not picky. Any  $\kappa$ -saturated strongly  $\kappa$ -homogeneous model of a stable theory will do—as long as  $\kappa$  is big.

**YALEVOYLIAN: WHAT'S YOUR FAVOURITE HOT BEVERAGE?**

Coffee. (And I don't trust anyone who would answer otherwise.)

**HELI×2: WHAT'S YOUR FAVOURITE COURSE TO TEACH?**

I haven't taught it very often (and maybe that's why) but I enjoy teaching Algebraic Geometry (PMATH 464) very much; you get to do some deep and beautiful theory development while at the same time studying natural and concrete objects.

**HELI×2: WHAT'S YOUR FAVOURITE QUICK DISH TO COOK?**

It's called kadhi and khichdi. I guess it is Gujarati? I learned it from my mom when I was a student (more on this below), though I've added my own flourishes over the decades. Khichdi is boiled rice and split mung beans, and is related to—and indeed the origin of—the British Raj breakfast dish called kedgeree. Khadi is a spiced yogourt dish with fried tomatoes. I add fried green beans and herring. Easy peasy, and delicious.

**TERMINAL: CAN YOU RANK THE STARBURST FLAVOURS?**

No.

**LAYTH: EVERYONE SHOULD DO RESEARCH FOR PROF. MOOSA IF HE'S WILLING AND ABLE! FANTASTIC SUPERVISOR :) THAT IS ALL, THANKS PROF. MOOSA!**

Thanks Layth, you are very kind. (And the cheque is in the mail.)

**NOT FAILING FR FR: WHAT COURSE DID YOU ENJOY LEAST AS AN UNDERGRAD? WHAT WAS YOUR WORST COURSE?**

First year biology. Actually, I enjoyed the lectures and reading the texts. But the labs! I hated every minute of it. Somehow stressful and time consuming while having no intellectual content (that I could decipher). At some point I realized I could get by with a decent grade even if I skipped all the remaining labs, and I have never seen the inside of a lab since.

**BOLDBLAZER: DO YOU LIKE SOUR GUMMIES? WHAT ABOUT OTHER SWEETS? ARE THERE ANY OTHER TREATS YOU LIKE TO ENJOY?**

Does beer count?

**BOLDBLAZER: WHAT DO YOU FIND VERY POGGERS ABOUT YOUR WORK?**

That, even as I age, I have enough contact with young people to learn words like “poggers”. Also, being paid mostly to think is pretty poggers.

**BURGER 🍔 : ANY INTERESTING STORIES FROM WHEN YOU WERE A STUDENT?**

In third year I moved into a student house. There were five of us and we lived communally; that is, all food was shared and we each cooked one dinner a week for everyone. I was thrilled to move in with this group, they were a very interesting bunch, and indeed several of them have remained lifelong friends. But there was a big problem: I could not cook.

Like most East Indian men of my generation, I had hardly spent any time in the kitchen growing up. And these new friends were foodies who were not going to accept frozen pizza. On top of that it was a vegetarian household. So my mom cooked with me! No, she didn't show up at the house, but every time it was my turn, at least for the first semester, I would call her (on a landline phone, of course, long distance) and she would tell me what to do, staying on the phone with me throughout the process. It was remote cooking lessons without video. It was actually a lot of fun; a new kind of interaction with my mother that I think we both enjoyed. And the distance meant that she couldn't slap me whenever I messed up. I learned four or five dishes, which is more or less all I make on a regular basis now, thirty years later. Near the end of her life, my mother grudgingly admitted that at least with respect to one of the dishes (a dal curry) I had surpassed her.

But there is a funny story about the dal curry. Making the dish starts with soaking overnight and then boiling four different kinds of lentils. (Aside: it is a bit weird that we use only four kinds as there is a common five-lentil curry—panch dal—that many people know. I don't know why ours has only four. My own conjecture is that when my mom was learning it

from her mom—or maybe in an even earlier iteration—they happened to be out of one of the kinds of lentils. It got dropped from the recipe and the error has propagated through the generations.) Anyway, this preparation takes a long time, and my mother offered to pre-soak and boil and then freeze the lentils for me. I would take a yogourt container full of the frozen lentil mixture from the freezer on my way back to university after a weekend at home, and use that to cook my dal curry. One day the dal was exceptionally good: rich and flavourful. My housemates all commented on the noticeable improvement and I soaked in the praise, humbly asserting that I didn't know what I had done differently but that I guess I was becoming a natural chef. Suddenly, one of my housemates starts screaming as she pulls a small bone out of her mouth! Yup, I had taken the wrong yogourt container from the freezer—a different lentil dish that my mother had frozen for other purposes, a dish that includes pieces of meat (I think goat) that is simmered for so long that the meat itself more or less dissolves leaving only bits of bone. It was the goat fat and bone marrow that my vegetarian housemates were so thoroughly enjoying.

#### **EVALUATED: WHAT'S IT LIKE EDITING FOR A MATH JOURNAL?**

It's fun. I only started doing it a couple of years ago. Besides editing for the Canadian Journal of Math and the Canadian Mathematical Bulletin, I am involved in a new journal called "Model Theory", the first of its kind. Maybe I should clarify what being an editor in this context means: it does not involve any manipulation of the text, so not like "editing an essay". Rather, it is the job of selecting what papers get accepted into the journal. This is done by both making your own judgements about originality and importance, but mostly by finding appropriate experts to give their opinions and referee the submissions. In some very small way you get to influence the direction your field is taking; you become an arbiter of taste and quality. Of course, most of the work is administrative and managerial, but even that is satisfying as it feels like a concrete service to the mathematical community.

#### **JEFF: WHAT'S YOUR FAVOURITE BATHROOM ON CAMPUS?**

There used to be a small one on the second or third floor of the Physics building whose sign read something like "Staff Washroom. Men". It reminded of high school, but now I was on the other side, allowed to go in. I used to get a kick out of using that one whenever I was teaching nearby. I think the sign is gone and it is no longer exclusively for staff. I miss it.

#### **NOT\_A\_UW\_STUDENT\_(YET): YOUR FACIAL HAIR LOOKS AMAZING! ANY GROOMING TIPS FOR AMATEUR BEARD GROWERS?**

Thanks. The trick is spending at least 45 minutes a day growing your beard. (Oh, and avoid shaving.)

#### **X: WHAT'S SOMETHING YOU ENJOY DOING OUTSIDE OF MATH?**

I don't really have any all-consuming passions. But I do have a number of long standing non-mathematical interests. Reading, for example. I also enjoy classical music concerts, and especially the opera, though this came later in life, only once I had some disposable income. For something like the last ten years I have had a standing weekly tennis match with Jason Bell, itself a heroic exercise in humility. And I have always enjoyed the outdoors, especially canoeing, hiking and cross-country skiing.

#### **0.423: FOR SOMEONE INTERESTED IN FURTHER STUDIES IN LOGIC, WHAT UNDERGRAD COURSES WOULD YOU RECOMMEND TAKING?**

We have recently reconfigured the logic curriculum. There is now (or soon will be) one general introduction to mathematical logic (PMATH 432) that should be offered every Fall and includes a bit of everything (proof theory, model theory, set theory, computability theory). And then there are two follow-up courses, one in model theory (PMATH 433) and one in set theory (PMATH 434), that will be offered in alternate Winters. (There is also the occasional PhD-level topics course, that is often accessible to advanced undergraduates.) A strong background in third-year abstract algebra (PMATH 347 and 348) is certainly useful, if just for mathematical maturity.

## ISSN 0705-0410

**UW'S BASTION OF ERUDITE THOUGHT SINCE 1973**

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# ON WORKING ALONE

profTHOUGHTS 153.6

Once, when I was in grad school, I complained to my supervisor about a technical problem I was stuck on. His advice to me was to “stay up one night with a bottle of Scotch and a pack of cigarettes and figure the bloody thing out for yourself”. (In case Dean Giesbrecht is reading this, I want to assure him that I have not emulated this pedagogical style.) I can’t remember how literally I took his advice (what grad student can afford a bottle of Scotch?), nor whether the problem eventually succumbed to my efforts, but the core of the advice, stripped of its endorsement of unhealthy lifestyle choices, is, I believe, a good one. I think it is correct that most of the learning we do comes from extended periods of focused solitary effort.

I know that this is a bit against the grain of how we do things at Waterloo. We value group work here. Students are encouraged to collaborate and to make use of whatever resources are available to them. While we are careful to warn against plagiarism and to emphasise academic integrity (for example, students are told to give credit to those they work with), we are on the whole convinced that students learn a lot from each other, and that problem solving in groups is beneficial. And I think we are basically right in this. The proof, after all, is in the pudding: we have an outstanding undergraduate programme with many excellent and successful graduates.

Nevertheless, it strikes me that students are often too quick to seek out external sources of inspiration and information. I would like to see students begin with a more serious effort to sort things out on their own. Not only because this tests their knowledge better, and in the long run sharpens their problem solving and abstract thinking, but also because that is a big part of the joy of doing mathematics. Of trial and error and eventual discovery. One of the advantages, in my opinion, of mathematics over other sciences (and one that it shares with certain humanities like philosophy) is that the core challenges in mathematics are purely intellectual. It is possible in our field to get somewhere, to make actual progress, without looking outside of ourselves. Pen and paper, and a few books, are really all that you need, and ultimately even the books are extraneous. Mathematics is one of the few disciplines where “working” and “doing” is really mostly “thinking”. (That clip of Raj and Sheldon working hard comes to mind.) And we probably do our best thinking offline and alone.

The value of talking with peers about mathematics is beyond doubt. Besides giving us exposure to other approaches and insights, the very act of organising and articulating our thoughts pushes our ideas forward, makes them concrete and gives them shape. But solitary work is a precondition for this; you have to bring something to the conversation. And that something is forged on your own.

Prof. Rahim Moosa

# THE LEFT WALL

ALL ROADS LEAD TO E2

On a free morning before the start of term, I had an idea. I started in the bridge to nowhere from the DWE building. Then I followed the left wall, skipping classrooms, but taking every corridor and staircase I reached.

The tunnel connects to the DWE staircase. From there, I went into CPH, down a staircase, and into the E2 building. Then things got interesting.

Up, down, and around. Down and out of the building, only to loop back in another door. Retracing my steps, one floor higher or lower. I must’ve followed half the walls in the building!

Then I reached the tunnel to RCH. Closed for construction work. But from my memory of the building, I think I’d end up leaving through the tunnel to DWE.

Up some stairs, and down the corridor to an exit. Only to loop around outside, and hit the same stairs a floors higher!

And then, through the connecting tunnel, I went *back* to E2.

Somehow ending up on the other side, I found myself at a staircase to E3. Except the top was in the middle of the room, so I was sent right back down!

Instead, I left the building, and followed the outside wall to a strangely hidden staircase in the side of E3.

Disaster! A locked door. I don’t know E3 like I know RCH, but after way too much searching, I found the corridor on the other side.

Back to E2, then E3, then E2. At long last, I made it back to CPH, and out the front door. But that just led to following the outside wall.

Another locked door. This one turned out to be an emergency exit, so I skipped it. After more CPH wanderings, I returned to the DWE staircase.

Was I done? Nope! Back down the hallway to E2!

But I was close. That path took me straight to the DWE connection, and back to the tunnel. After an hour and a half, I had returned to where I started.

But this is **mathNEWS**, so having completed this hour long loop, I have but one question.

Which knot is it?

*finegeometer*

# SANRIO CHARACTERS AS MATH MAJORS

**Actuarial Science:** Chococat. Actuarial science is the closest thing to AFM, and people in AFM backstab each other. If actuarial science people were able to pick up information like Chococat's whiskers, they'd be more able to backstab.

**Applied Mathematics:** Chibimaru. Chibimaru is a brown puppy that spends time inside his owner's bag, similar to how the Applied Math Club got absorbed by the Pure Math Club.

**Biostatistics:** Mimmy. Mimmy is Hello Kitty's cute twin sister, slightly less outgoing, but with a more polite and thoughtful personality than Kitty. She's also the forgotten character. No one knows who Mimmy is. Just like how no one knows what biostatistics is.

**Combinatorics and Optimization:** Chibimaru. Chibimaru is a brown puppy that spends time inside his owner's bag, similar to how the Combinatorics and Optimization Club got absorbed by the Pure Math Club. *[Editor's note: hey that's just not true]*

**Computing and Financial Management:** Garnet. Garnet is a pink female Persian cat Jewelpet, a sassy and fashionable cat who cares about her looks. To some, she is too prideful, but she is actually very hardworking, just like all the CFM majors I have met.

**Computer Science:** Hello Kitty. Hello Kitty is the main character, just like how everyone I've met in computer science has main character syndrome even when they should be the side character in an irrelevant story. (Also known to say "Hello Kitten" a lot.)

**Computational Mathematics:** I've literally never heard of computational mathematics 'til writing this article, but I'll give you guys Macaroon. She's cute and has a good spirit, and I assume most of you guys have a good spirit.

**Data Science:** Dear Daniel. Dear Daniel is Hello Kitty's friend and boyfriend, and they've known each other since they were babies. Data science and computer science are inseparable; you can't have one without the other.

**Double Degree (Mathematics/Computer Science):** Kiki and Lala (Little Twin Stars). Can't have one without the other.

**Mathematics/Business Administration:** Kuromi. Kuromi is basic and I see no difference between most math/business majors therefore you guys are getting assigned Kuromi.

**Mathematics/Chartered Professional Accountancy:** Cinnamoroll. Cinnamoroll is shy but friendly and always wants to help out his friends when needed. Being a CPA will help you in your career path, just like how Cinnamoroll will help out his friends when needed.

**Mathematical Economics:** Kuromi. Kuromi is basic and I see no difference between most math/business majors therefore you guys are getting assigned Kuromi.

**Mathematical Finance:** Badtz-Maru. A common expression of Badtz-Maru is pulling one eye down and sticking out his tongue, a gesture equivalent to blowing a raspberry. This gesture reminds me of cocky finance bros therefore you're getting lumped in with finance bros.

**Mathematics/Financial Analysis and Risk Management:** My Melody. I have no other reason aside from that I'm in FARM and she's my favourite Sanrio character.

**Mathematical Optimization:** Pochacco. Pochacco has a difficult time walking, usually resulting in head injuries and will sometimes be seen with bandages. You guys put in a lot of effort trying to become combinatorics and optimization, but it will often result in head injuries, just like Pochacco.

**Mathematical Physics:** Keroppi. Keroppi loves adventure and has a bubbly personality, making him popular around Donut Pound. Almost everyone I've met in mathematical physics has at least a somewhat bubbly personality and is somewhat popular.

**Mathematical Studies:** Mocha. Mocha is a kind and caring friend and an older sister figure to Cinnamoroll and their other friends. Older sibling figures almost always have a broad range of knowledge, just how mathematical studies has you study a broad range of topics.

**Mathematics/Teaching:** Pompompurin. Pompompurin is a good-natured golden retriever dog, and I assume most people going into mathematics/teaching are good-natured since teaching (usually) doesn't pay well.

**Pure Mathematics:** Deery-Lou. Deery-Lou is social and has friends, and I often see pure math majors interacting with others.

**Software Engineering:** Charmmy Kitty. Charmmy Kitty is Hello Kitty's pet cat; she looks like Hello Kitty but with more cat-like features. At this point, software engineering is just computer science but with an iron ring since UW has removed so many of the engineering requirements.

**Statistics:** Mogura. Mogura is a little introverted mole character, and I've never met an extroverted statistics major, therefore I'm assigning you Mogura.

cherry ♡

pls dont eat me alive lol this is all for jokes

# BE BALD, SHOOT GUYS

It's the kind of thing you can't say out loud: it's fun to shoot guys.

I know, I sound like the guy in *Pumped Up Kicks*, but it's true. I don't know if it's historical accident or evidence of base human nature, but enormous amounts of the gaming industry are based around giving you, the player, a permission structure to Shoot Guys.

Maybe the guys are zombies, so it's ok to shoot them. Maybe the guys are Nazis, so it's ok to shoot them. Maybe the guys are squid human things and also it's ink, not bullets, so don't worry about it.

This is great fun. But maybe we've lost something along the way—loot boxes, celebrity voice actors, unwelcome platforming sections—the Shooting Guy supporting cast has overtaken the Shooting of the Guys, so to speak.

What if I wanted a game that knew I was *just* there to Shoot Guys?

Enter *Max Payne 3*.

*Max Payne 3* is a continuation of the *Max Payne* series by Remedy Entertainment. For the third installment, the series has been taken over by Rockstar Games (the GTA people). You can tell they've done it, since it has a (very) slimmed-down version of the GTA V weapon wheel and the ragdolly physics we know and love from GTA car accidents.

In *Max Payne 3* you play as Max Payne, a washed up cop turned private security guard who descends into the São Paulo underworld after one of his protectees is kidnapped by a gang. You are betrayed by your friends, disillusioned with the corrupt system. You reach rock bottom (and shave your head) but eventually get revenge. You get it.

It's a classic noir story (like the previous games in the series), for good and ill. The game literally hits you in the face with the story. Choice lines will appear on the screen one word at a time. You get the atmospheric world-weary inner monologue, but also a bunch of similes that are *this* close to being parody.

*The guy was smoother than a oil slick on an iceberg, and about as toxic.*

MAX PAYNE

To be fair, this is the only one that made me laugh out loud.

Enough about the story though, you're here to Shoot Guys.

Since Shooting Guys has such a storied gaming history, it's hard to break new ground. We've settled on "use mouse to aim at guy and click to shoot", and this can really peril a shooter with samey gameplay, especially if your protagonist isn't, like, magical, or a cyborg.

The *Max Payne* series has always had a solution for this: bullet time. You can press one button to slow down time and shoot. Press another button and you'll perform a shoot dodge: time slows down, you dramatically jump (optionally over an object) and you start shooting.

This is really the key point of the series, and Rockstar has added their own stamp on it by letting you ragdoll during this process. This either leads to very cool moments where you brush over a table while killing three mooks, or accidents where you crumple up like a shrimp and are shot in the kidneys.

This really livens up gameplay, and allows the game to put you on relatively equal terms with your enemy (at least on hard mode). Your sole advantage over your enemies is bullet time. You shoot them a few times, and they die. They shoot you a few times and you die. This makes you think more and means that you can't just blunder around corners without paying for it.

The bullet time isn't a free lunch either: it's enabled by a limited bar that regenerates with kills. The shoot dodge leaves you on the ground after, so you have to slowly pick yourself up (you are middle-aged in this game) to keep shooting. You have to pick your spots: and you can't just shoot dodge into the open, without having an idea of where you're going to be afterwards.

Rockstar also hasn't neglected the feel of Shooting Guys either. The game is designed to give you action movie worthy moments, like scripted sequences where you get a really long shoot dodge, usually as stuff explodes behind you. There's also a fun little addition where the last enemy in an encounter goes into slow motion as your bullets hit him.

Finally, you get a Last Stand mechanic where if an enemy kills you (and you have health packs left) you get one last chance to kill your attacker in slow motion. If you pull off the shot, you consume a health pack and save your life. This whole sequence also happens in ragdoll mode, so it's either really cool, or really funny as you struggle for life with your gun hand stuck behind a light pole.

In short, *Max Payne 3* is a shooter game that has focused on making Shooting Guys fun and unique, with an emphasis on those movie moments we all want to relive in our games.

It's on sale on Steam for \$8.99 but the sale will be over by the time you read this. Just pirate it—Rockstar prints like 86 million dollars a year from GTA Online anyway.

UW Unprint



# TRYING TO SELL YOU ON INNER TUBE WATER POLO

Inner tube water polo. The *people's* sport.

Any devoted fan would attest that there's simply no greater thrill on Earth than sitting on the edge of the PAC stands, watching the waves roll in our non-regulation size pool, feeling the tubes of the champions crash against each other, and hearing the thunderclap of shots sent and saved.

Those who say that would be wrong. A greater thrill is playing.



For those who haven't been exposed to the sports sensation sweeping the school, inner tube water polo is an intramural that Waterloo Athletics runs every term. It features the general structure of water polo—that you're in a pool and you have a ball you need to get into the other team's net—but with a single new addition: the tube.

Yes, you play inner tube water polo entirely from inside the titular inner tube. Some people look at that rule and see a game that's neutered, or less skilled in some way, just because you aren't physically moving around and tackling the other players. Those people are only sort of right.

The floor for the amount of physical athleticism is much lower than in regular water polo, helped by the ability to “rest” and float passively on the water in a way you can't during the non-tubular version of the game. But the ceiling of talent is as high as any “real” sport you can play.

You need speed and strength, sure, but that's just the surface. You need to be able to read your enemies, and have the game-sense to position yourself right where they need to be, or slip behind them without them noticing—a difficult thing to do when propelling yourself requires you to splash.

See, the tubes themselves change the dynamics of the game completely. If you're on defense, it's much harder to strip the ball or make an interception, so the ideal tactic is strategic positioning. Conversely, if you're on offense, it's almost impossible to make a shot if you're surrounded by defenders, so the ideal tactic is nimbly passing the ball around to the least defended player, positioning yourselves so that someone is open at all times.

Even if you don't have the physical stamina to play football, basketball, or even dodgeball, you can still easily be competitive playing inner tube water polo. A smart player is much more dangerous than a strong one.



When you slip into the tube, you can feel the rest of the world slipping out.

It almost acts like a sensory deprivation experience. Besides your complete mental focus on the state of the game, the

noise generated by 12 people smacking the water as hard as they can will allow you to tune out the noise of the crowd, the sidelines, and your thoughts. If you need to take off glasses to participate, you get the further effect of having the entire world other than the boundaries of the pool literally melt away.

You focus on speed, and position, and analyze, and execute until you blink and realize that it's been fifteen minutes and your legs and arms are sorer than they've been in months. You swim off to the sidelines, and only then does it hit you that you're up a point.

Some inner tube water polo players say that the greatest thrill you can have is playing. Those people are wrong. A greater thrill is winning.



I think the thing that surprises people the most about this sport is how seriously everyone takes it. At first glance, it can seem pretty silly: a dozen college kids flailing around in inflatable floaty tubes, bouncing off each other and yelling at the top of their lungs. But look any closer and you can see that these people *care* about what they do.

Teams have rehearsed strategies and coordinated cheers and matching branded shorts. You can feel the tension in the sidelines—not to mention the crowd—as the ball goes back and forth and again.

It's a give and take situation, of course. Everyone on some level knows that these sports don't *really* matter: they aren't matters of life and death, nor even a matter of personal prosperity (like getting an education or a job). In order for you—or anyone—to feel like this, you need to take the first step to make it matter to yourself.

If you want to create a world in which people care about anything, you need to believe in it too. While this confidence is irrational at start, rationality often grows *around* your own beliefs. The most reliable way to create the world you want is to pretend you're finally there.

It's shocking how effective a change strategy “intensely believe in something unrealistic” actually is, y'know?



You slip out the backdoor of PAC and step into the biting, punishing Waterloo air. It's a night with clouds and a slight sprinkle of snow—the first of the year—but the sky is considerate enough to give you a full view of the moon. You're wet and it's cold.

Walking back, you can feel a repressed frustration. You had fun, of course, but you *wanted* to win. It's intensely petty to admit it, but it bothers you.



But there's no time for frustration to fester into self-pity, as the people around you start directing that frustration by colluding about what's next. Making plans to dominate next season, which turns into eagerly making plans on how we'll fill our lives beyond the game.

You count yourself incredibly lucky.

Some people say the greatest thrill you can have is winning. Those people are wrong. The greatest thrill you can have is losing, because it means you still have something to play for.



Do you feel me? Are you in?

Dick Smithers

## CYNICAL

I'm an optimist, and it takes a lot for me to become cynical about a topic. What about you? What does it take for you to stop seeing the bright side, the side that has a simple and non-malicious (albeit maybe unpleasant) explanation? When does your trust boil enough into distrust that you know you can't go back?

What does it take for cynicism to develop regarding your own government? Your own country? For some people, this distrust and skepticism is available almost immediately from birth. For others, it never develops at all. For me, it develops slowly over time on a case-by-case basis.

But it's when my own country's policy is set up in a way that bars me from a certain type of happiness—almost as if it was written to strike down specifically my hopes and dreams—that I now become cynical quickly. Occam is fully shaven, not a hair on him, but there's no way that here, the simplest explanation is true. Certainly, the policy is written with me and those I may love in mind.

Except it's not just a policy that affects me; it affects so many millions of others! What can you even do with this information?

It really is something to become cynical.



I don't mean to vaguepost or to hint, I just think it's inadvisable to get into the specifics here. The truth is that you can plug so many policies into the above depending on who you are and what you are facing. But I guess it was just my time to encounter such a problem that really cannot be worked around without pain and difficulty, no matter what I try.

blinchik

## AN ACTUAL TOUGH gridWORD

*"OH THIS gridWORD IS PRETTY TOUGH" — SOMEONE WHO DOESN'T KNOW THAT ALL OF THE ANSWERS ARE EASILY GOOGLEABLE*

I suppose if you are a romantic for times when dysentery was a concern, maybe doing these puzzles without googling is appealing to you. For the rest of us, I have created a real **gridWORD**. A challenge of a **gridWORD**. A **gridWORD** for our modern times, for our modern worries and concerns, for our modern hopes and modern dreams. A **hardMODE gridWORD**. There is a singular correct solution, and the theme of this puzzle is "Things that only aphf could possibly know and very questionable answers". In another revolutionary upgrade over not just traditional **gridWORDS**, but also traditional crosswords, 100% of the words in this puzzle are themed. If anyone submits a complete correct solution by v154i1 prodnight, I'll give you 500 dollars (monopoly).

In the theme of this being a **hardMODE gridWORD**, the **gridQUESTION** is also **hardMODE**. "What is a joke that will make me laugh?" Incorrect answers will not be considered.

### ACROSS

1. My starting Wordle word
6. What I think is the silliest NHL team name
7. Ugly Apple device?
8. What the big concrete wall north of my hometown would be called if we had cars capable of flight
9. The third verb I learned from Mr Farquarson

### DOWN

1. Quand les personnes \_\_\_\_ se plaignent, ma mère répondrait avec une réponse succincte incluant les jours de la semaine
2. Stay back, \_\_\_\_ go on ahead
3. My grandfather's middle name
4. What I think would be a good topic for another game theory sister channel
5. Acronym taught to me by the first upper year math student I met in Waterloo

1	2	3	4	5
6				
7				
8				
9				

# OBJECTS FROM THE mathNEWS OFFICE

## III: THE RAW STUFF

The **mathNEWS** in front of you is the product of an enormous amount of effort, dedication, and love from the **mathNEWS** editors. *However*, it's also the product of fifty years of technological development from thousands of people in Silicon Valley or whatever. Point is, issue production wasn't always an all-digital feat.

Suffice it to say, though: **mathNEWS** has some *really fucking good* archival practices.



FIG 2: RAW STUFF

On one hand, this is kind of uninteresting—like, yeah, of course **mathNEWS** has **mathNEWS** issues—but these are the *originals*. The source code, if you will. There were thousands of copies printed, but just *one* original. And, by some absurd miracle, most of them still exist, mostly intact.

These sheets of paper were run through analogue machines, beaten by typeballs, and sometimes written to directly in pen; the **mastHEAD** was usually handwritten directly onto the backing sheet, giving the poor editor writing it a bit of flexibility with its shape. And they're still here, forty five years later. The pressure applied to the pen is recorded on the paper.

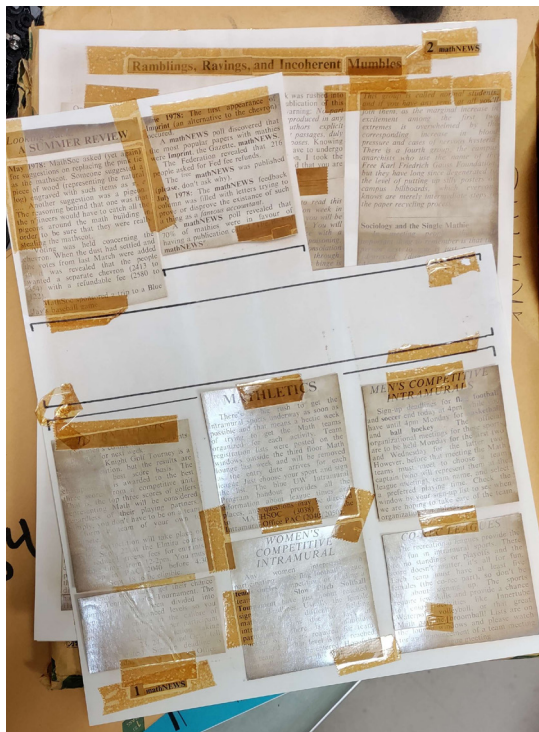


FIG 1: **mathNEWS 18.1** BEFORE BEING PUT IN THE OVEN

The musty smell of decades-old paper and kraft envelopes is intoxicating. In each envelope is yellowed pages, brown cellophane tape residue, and white-out that's somehow retained its brightness. The sheets are stored in used envelopes that **mathNEWS** sourced from generous professors of the time.

**mathNEWS** holds the vast majority of the flats (affectionately called *raws*) dating back to the fall of 1978. There are filing cabinets *full* of these. Patched together at some ungodly hour in the morning, sent off to Graphic Services, and later returned to the editors along with the completed print order. Some of the *raws* are a little skeletal; layoutists of the day had a habit of cannibalising bits and pieces from previous issues for re-use: things like filler and **mathNEWS** logos.

In the beginning, articles were typeset an IBM Selectric II typewriter, later typeset instead with a Photon 737 Econssetter hooked up to a Honeywell Level 66/60 mainframe running UNIX.<sup>1</sup> [Editor's note: It's a UNIX system!] After a great amount of struggle, articles would be printed in columns, ready to be cut out and taped onto a backing sheet.

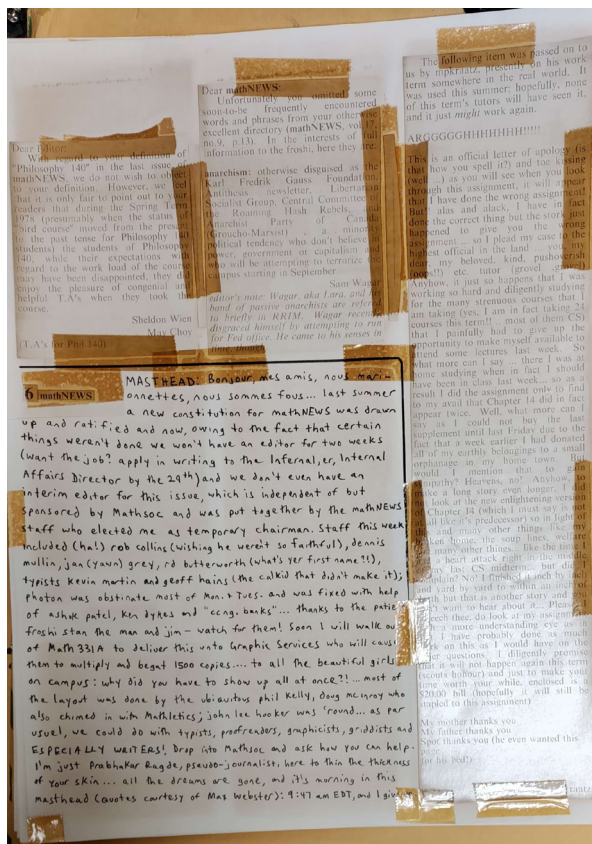


FIG 3: A **mastHEAD** WRITTEN BY PRABHAKAR RAGDE

A bunch of the original Graphic Services print requisition forms are still around too. The handwriting is a little light on some of them, especially the older ones. Not much has changed; the form is hosted on the web these days, but the options are mostly the same. Print doesn't really change.

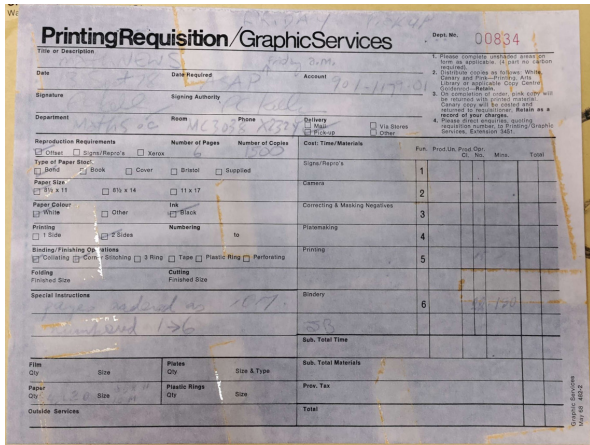


FIG 4: SEPTEMBER 13, 1978; 6 PAGES; 1,500 COPIES

Floppy disks, also in the filing cabinet, hold a bunch of the roff and TeX source files for articles going back to 1980. As decades rolled on, more and more of production came digital: eventually, the only things added in the “cut-and-paste” stage were photos and filler; probably not because they couldn't do it digitally, but more because it was easier or otherwise more practical to do it that physically. Another few years, and that went away too. The last few paper raws trail off around volume 80 in 1999. No brown tape residue; twenty-five-year-old PageMaker documents, image links missing, rejected layout configurations stuffed away beyond the margins.

Anyway, that's all from me. If you're in Waterloo next term, you'll see a few more of these then. Otherwise, that's it. See 'ya.

jeff

1. <https://www.cs.ubc.ca/~ksbooth/PUB/docs/JHBuccino1980.pdf>

**YOU'LL NEVER BELIEVE  
WHAT JUST WENT OUT OF  
STOCK AT EVERY GROCERY  
STORE I'VE GONE TO IN  
THE PAST MONTH**

molasses

# R PLACES IN SASKATCHEWAN

THAT ARE ACTUALLY JUST ONE OR MORE ENGLISH WORDS PUT TOGETHER

- Antler
- Antler
- Elbow
- Eyebrow
- Smiley
- Climax
- Forget
- Love
- Success
- Alsask
- Atwater
- Mankota
- Mantario
- B-Say-Tah
- Choiceland
- Radville
- Wee Too Beach
- Cut Knife
- Mazenod
- Netherhill
- Uranium City
- Big Beaver
- Big River
- Big Shell
- Crystal Lake part A
- Crystal Lake part B
- Evergreen Brightsand
- Goodeve
- Goodsoil
- Goodwater
- Nut Mountain
- Potato Lake
- Yellow Creek
- Yellow Grass
- Pelican Cove
- Pelican Narrows
- Pelican Point
- Pelican Pointe
- Pelican Shores
- Porcupine Plain
- Turtle Ford
- Turtle View

And of course,

- Moose Jaw

Whole Number Haver

This would be an N Things article but these places are real

# GET OFF YOUR DAMN PHONE

Trying to exist on the UWaterloo campus is a nightmare, and it's all your fault. The average UW student is so chronically online and so socially inept that it impacts my ability to effectively live my life.

If you're going to be on your phone, get the hell out of the way. The number of times I have been trying to walk down the hall and there is some dumb idiot standing in the middle looking down at their phone, completely oblivious to the world around them is astonishing. It's even worse when there are multiple people and I can't get past.

What's even more egregious is people who are walking and also looking at their phone. If you're going to go on your phone, at least pull over so I can get by. Unfortunately, everyone would rather just slow down (so they don't crash while distracted) right in the middle of the hall and stay in the way.

What's even crazier is that people do this shit outside on the street! I hope you walk into traffic. If I have to change my course while walking on the right side of the sidewalk to avoid your dumb ass, then we have a problem. Some day I think I'll sit and watch and wait for two people to just crash into each other because both of them are so glued to their screens.

I recently saw someone who was on their phone while *riding a bike*. At some point this has to count as distracted driving. You could hurt someone if you crash into them on a bike. You'll probably hit one of the idiots I've seen literally streaming a show on their phone while they walk through Waterloo Park.

In this age of perpetual connection, we miss out on the world around us completely. People would rather put earbuds in for a 30-second walk than just enjoy the sounds of God's beautiful Earth. By always being connected on our phones, we have become disconnected from what matters most: our planet.

If I ever have to ask someone for directions, I'm shit out of luck. My choices are to suffer and guess where to go, or upset someone by making them pause their playlist for 5 seconds only to look at me dumbfounded that I would be asking them something like that, rather than googling it. The only reason looking it up might be quicker is because I have to wait for you to take your earbuds out, pause your music, check your DMs, and post a tweet before I can ask my question. I love asking old people for help because they help me then and there, not in 7–10 business days. I would literally have an easier time asking a homeless crackhead for directions than asking a UW student with earbuds in.

There are so many sounds that you people are missing out on because you insist on always having music pumped into your ears. We have red-winged blackbirds that live in the wetland next to the ION stop, but I'm the only one who hears them because I am the only one who doesn't have my ears closed off to the outside world.

I was walking from uptown to campus through Waterloo Park and passed a man playing the piano across the train tracks. Despite there being plenty of people walking by, I was the only one who was appreciating his music because everyone else was lost in their own world with their own music in their ears.

Not only are people missing the sounds of the world, but they're also disturbing others by not hearing. I was once waiting for my tutorial to start in the bottom of MC and there were people sitting around studying. One guy sitting at a table was listening to music and tapping his stupid-ass feet on the base of the table which was clanging against the floor and he was none the wiser, while ruining the quiet study of everyone else there. I was there for 10 minutes and he was just tapping away the whole time and everyone hated him.

In conclusion, please just take a moment of your life to take out your earbuds, put down your phone, and appreciate the world. Oh, and also make sure you aren't completely in the way you stupid idiot.

Yamnuska

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## LARS NOOTBAAR'S PLAN FOR LONG-LASTING WORLD PEACE

### *BRIDGING THE DEEPEST DIVIDES IN THE WORLD*

I regret to inform you that Lars Nootbaar's Plan For Long-Lasting World Peace will have to be postponed until **mathNEWS** 154.1. I was really hoping to put this plan out for implementation this term, but circumstances beyond my control (namely a group assignment, a 5-hour brisket preparation, a gingerbread house, and drama related to infighting within student societies) have intervened.

In accordance with this, Lars Nootbaar's Plan For Ending World Hunger will be postponed until 2026.

Let us hope that the world continues to remain afloat until around mid- to late January, so we can put this plan into action.

Lars Nootbaar

Please do not get too excited about Lars Nootbaar's Plan For Long-Lasting World Peace, as this article may create expectations the initial article I planned to write (at 2 AM on a Tuesday) may not fulfill.

# THE MOUSE, THE BEAR, AND THE STORM

There had never been a mouse inside a great Arctic rainstorm. Mice are small, flimsy, and lack the fins or gills to allow them to swim proficiently, and should they try to stay out in a storm, they are sure to be swept away. This was to Mouse's great dismay, who was ever an explorer in any other weather. When Owl told of the great coming rainstorm, Mouse was heartbroken that he could not see the storm himself. Bear often worked alone, but when he saw Mouse so dismayed, he resolved that he would change the world. He would show a mouse a storm.

Three days before the storm, while the other animals built shelter and hunted meals under the last hours of sunlight, Bear's weathered claws dug into the permafrost-shielded ground. The animals lived on the flattest part of the land turtle's shell; when the stormwaters came, the icy plain would become flooded over, with all small creatures washed out to sea. With a mound of dirt free, Bear padded the dirt into a small hill, sure to crest above the floodwaters when the storm beckoned them to rise. Bear said to himself, "This is how I will keep Mouse dry."

But as Bear lumbered home that day, he realized that water would come from above as well as below. Mouse could not stay dry alone, yet, so long as Bear could shield against the rain and wind, Mouse could see the storm. Two days before the storm, Bear sought branches under a boiling grey sky. He set them around his hill as supports, so he could lean in any direction from the hilltop and feel the Earth hold him upright. Bear said to himself, "This is how I will keep Mouse dry."

But as Bear lumbered home that day, he realized that he had never seen underwater, and as his face fur got wet in the storm, he would be completely blind. On the last day before the storm, when the plains grew quiet and the skies grew dark, Bear ventured to the sea. From morning into twilight, he brought his head in and out of the water, each time opening his eyes wider. And when he could look into the depths, unafraid of the water, Bear said to himself, "This is how I will keep Mouse dry."

Bear returned to the cave that evening, and only hours after he returned, the animals heard the rain begin. The other animals cowered, but Bear found Mouse peeking out from the cave entrance. "Come," rumbled Bear. "I will show you the storm. I will keep you dry."

Together, Mouse and Bear left the safety of the cave. With the rain building around them, they reached Bear's hill, the branch supports around it sticking out as a crown. Mouse scampered up onto the hill, Bear stood firmly above him, and the two began to feel water.

In a growing chorus, the storm fell upon them. Rain fell in heavier and heavier sheets, and what had once been Bear's hill became an island in a dark and unforgiving sea. Lightning crashed down to the plains around them, and where trees could once be seen in the far distance, only stumps remained.

Winds screamed in their ears, as the sonorous beats of the Great Birds' wings thundered across the land. But Mouse was dry. As the waters rose higher, from the dirt watchtower, Mouse looked out across their boiling waves as no other mouse ever had. As the winds grew stronger, safe under Bear who leaned against his branch supports, Mouse saw sheets of rain as no other mouse ever could. As the lightning grew more constant, Mouse looked to the sky to see brilliant green and purple magnetism intermix with lightning's harsh strokes, drawing a canvas no other mouse would ever see.

Mouse could see the storm.

*Crack.* Mouse jumped, searching in the darkness only to see one of Bear's supports snapped and swept away. *Crack. Crack.* With the first branch gone, more soon followed, snapping and sailing away until only Bear and Mouse remained. Both looked into the dark, and as the rain dampened for a brief moment, a web of lightning broke across the sky. Wings of electric light stretched as far as the eye could see, the aurora become feathers viridescent and rose, the moon and brightest star become a pair of eyes.

*SHELTER*, commanded the wings in the sky. The lightning vanished, and as its thunder arrived, a great gust of wind blasted Bear into the sea.

Mouse flew.

The hill was empty.



Bear's head thrashed out from the floodwaters, and he clawed back atop his overlook. Mouse was gone. Bear searched the darkness, seeking some sign, a claw, a tail, any hint of a mouse. He submerged, and amid the rushing floods, a hint of fur shone out before disappearing out of sight. Bear charged, fighting the water's current, each step a battle as he chased signs of Mouse along the flooded plain. Closer, closer he came, until he had Mouse within striking distance. Bear opened his jaw, and ripped Mouse from the waves.

Bear sprinted back to the cave, and with the other animals gathered around in shock, he coughed up water, ice, and a wet, saliva-coated mouse.

Mouse's eyes shot open. The animals of the cave gathered around him; Elk directed animals to get food and warm leaves to nurse Mouse back to health. Soon, Mouse was carefully wrapped in leaves with berries aplenty to nurse upon. Hearing Mouse quietly chattering, Bear lumbered to the back of the cave. With a sigh, he dropped to the cave floor, lying his head flat against the stone.

"I'm a failure," thought Bear. "I couldn't keep Mouse dry."

# WATER WATER WATER (FIRE FIRE FIRE)

## THE ZUTARA WATERLOO AU OF YOUR DREAMS

it feels like she's fighting a war.

the landing between the ninth and tenth floor of dana porter stairwell b belonged to *her*—she'd spent a good portion of her first year perfecting the choice; whether it was finding a floor where she could avoid even the most dedicated stair-climber outside of pac, or switching to the side away from the elevators in case anyone ever got frustrated by the delay it took to reach the upper levels. it might not have been easy, but katara was used to testing her code. she tested this until it worked too.

(and it *had* worked. when she got stuck on a particular error, when she was down to the wire before a quiz, when she just wanted some space to breathe. she knew where to go, because it was hers—she hadn't even shared the location with her friends, no matter how much aang asked.)

when second year closed its grip around her throat and dragged her back to waterloo and an apartment that was much too small to hold both her and sokka and everything they disagreed on—though it *was* only a five-minute bus to campus—she found herself packing up her laptop on a tuesday night and walking into the warm september air. it hadn't been a conscious decision, really, but there she was waiting for the elevator, watching the electronic numbers tick up until she was crossing the eighth floor and vanishing through the door to stairwell b.

it isn't even until she looks up from the stairs under her sandals that she comes back to herself, because her spot is, impossibly, taken. by a boy she's never even seen before—dark and lanky, a shiny new computer balanced recklessly on an outstretched leg while a notebook tips out from his crossed arms—head dropped low as he leans into the back corner.

he doesn't even react to her.

(it's not her proudest moment, then. but the hour is late and sokka had been particularly annoying as she'd been on her way out and it's only two weeks into the term so it's too soon to be falling behind in her assignments, and she can't help but bristle at the sight of him. here. *napping*.)

“hey,” she snaps, stomping closer. he does move at that, chin lifting slightly at the sight of her like it's a challenge. “what are you doing?”

he stares back at her. blinks, behind the dark hair in his too-bright eyes. “are you a librarian?”

“what?”

his lips curve up slowly to the left, the wry motion almost blurry compared to the tilt of his head to the other side—his hair shifts enough with the movement, exposing more of the scar tissue running along his cheek towards the device in his ear. “are you kicking me out?”

that pushes her back into action. “yes,” she says without hesitating. “that's what i'm here for.”

he lets a sigh, plucking the laptop off his knee. “yeah, thought so.”

the tiniest bit of guilt nudges at her, but she tightens her grip on her messenger bag—it's not like she can back down now. and it's *her* spot. “just don't let me catch you here again.”

the boy gives her another of those tiny smiles as he leaves. she finishes her assignment in the opposite corner once he's gone.



he's typing the next time she sees him, fingers flying over his keyboard and a screen illuminating his expression. she barely gets a glimpse before he glances up, any of the fatigue found in the blue light tracing the scar and bags under his eyes immediately drained in the next breath. a scowl blooms across his mouth instead.

“you.”

so maybe it isn't the best start.

“me,” she answers, an apology already forming in her head—his perspective of her has clearly changed since their last encounter, and it's a friday this time. she isn't looking for a fight before her weekend starts—she just has some work to be done before aang's last class, and they're heading over to meet with sokka afterwards. “listen, about before—”

“you're not a librarian.”

katara can't stop herself. she laughs. “no, i'm not.”

he squints harder at her, practically glaring. “i'm not moving, you know.”

“i wasn't going to ask you to,” she says defensively, “i just wanted—”

“to trick me again, right? do whatever it is that you do, even if you're a liar?”

“it wasn't like that,” katara says. he laughs at her, drier than the leaves dropping to the ground outside, and she frowns, setting back her shoulders. she knows guys like these—they're all over her program. angry, accusatory. more arrogant than anyone deserves to be. “you left voluntarily,” she states, biting out the words. “i didn't even say much, you went without arguing.”

“i *thought* i was following orders,” he returns, “i thought you—”

she huffs out a heavy breath, crossing her arms. “quit overreacting.”

if she thought he'd been glaring at her before, she'd been wrong—whatever stare he has for her now is new, and *worse*.

“forget it.” despite his warning earlier, he pushes quickly to his feet anyway, shoving his computer roughly into his bag. “enjoy *this* while you can, ice princess.”

the door swings shut before she can even set her things on the floor.



he'd meant it. the next time she finds her way there, there's a yoga mat unrolled on the floor and a boy sprawled across it

with a blanket, headphones on and eyes closed. it's her turn to scowl at him as she approaches, but he only blinks up at her—that same smile she'd almost started getting used to tugging across his lips, echoed in smug amusement she *does* know too well.

“whatever you're looking for,” he says, waving a hand, “you won't find it here.”

she walks away, this time. she hears his laugh ring behind her.

it's war, and they both know it.

big a

ps guys i don't even ship them

## N THINGS THAT I, A NON-DRIVER, WOULD DO WITH A CAR IF I HAD ONE

Why do people own cars? They're too expensive and yeah, I go to a lot of places, but most of those places are accessible by bus and when you're riding a bus you can look at the fun and interesting things by the side of the road instead of the boring things on the surface of the road. Of the non-bus-accessible places, small towns are too weird, farmland is even more unpleasant, and all the other places are too far away. And if I'm going far away anyway, I might as well get on that 10-hour train to New York or something. But, fine, as someone who has never touched a steering wheel in my life, here are some of the things I think I would do if I owned a car:



- Reenact the above image
- Drive to the Bloomington GO station (the new one with the giant fancy parkade in the middle of nowhere), take the last inbound train of the day to Toronto, wander around for exactly 6 hours and 40 minutes, take the first outbound train of the day back to the Bloomington GO station and drive home
- Drive in a circle around the roundabout at Laurelwood Drive and James Downey Way over and

over again until somebody stops me or I run out of gas

- Go to the middle of nowhere and look at stars I guess?
- ~~Go to the Halton County streetcar museum~~ (I already got a friend with a car to drive me here one time and it was cool but I don't need to go again)
- Go to Windsor and try to walk across the border and probably get arrested, either because I'm walking in an area where you're supposed to drive or because I forgot my passport
- Go to a city I don't like and drive really slowly on the highway to annoy people
- Drive at the speed limit because apparently, people don't like that even though it's the law
- Try to drive onto the Burlington Canal Lift Bridge right before it goes up
- Park on the top floor of an otherwise empty parkade
- 9/11
- Get one of those co-ops in that one industrial park outside Ottawa and finally figure out why so many offices are there and why they don't seem to have any decent transit routes
- Buy a Very Large Item from a suburban IKEA and then try to return it to the Yonge and Gerrard IKEA
- Try to successfully (unlike the recent guy) fly from the US to Canada in a car
- Find a new, innovative way to crash into an ION train
- ~~Park in the unpaved parking lot next to ECH~~ I'm being told they are currently paving it 😊
- Press the go pedal and the stop pedal at the same time

# REVIEWING SEVERAL RELATIVELY UNKNOWN BOOKS

## BASED ON HOW WELL I REMEMBER THEM

Okay, so it's pretty obvious at this point that I've run out of ideas. The evil capitalist story arc is done (although capitalists still exist and are inherently evil) and my life hasn't been interesting enough lately for me to have anything new worth writing about. So without further ado, here are my thoughts on some (mainly YA<sup>1</sup>) books, in no particular order, based on what I remember about them:

### DOUBLE THREAT BY F. PAUL WILSON

Apparently the author turned this book into a series and it was made into a movie last year? I started reading this book to reach a reading quota for my grade 11 English class, and I thought the premise was interesting, but then the author just... didn't go anywhere with it? I got, like, a third of the way through the book and was bored out of my mind, but I kept going because I'd already committed at this point and thought *surely* it had to get more interesting.

I read the whole thing, and spoiler alert: it didn't. It ended on a wishy-washy cliffhanger which I assume leads into the rest of the series, but I could not bring myself to try to follow through on it. There was also this extremely mind-numbing romance B-plot with the main antagonist's son that the book definitely could have done without. The fact that this is really the only thing I remember along with the fact that the first scene involved a slug tells you all you need to know. 3/10.

### THE AURORA CYCLE SERIES BY AMIE KAUFMAN & JAY KRISTOFF

I started this series much the same way as Double Threat, but the results of this adventure were much more fulfilling. To begin with, the premise is much more interesting, seeing as it is mainly set far in the future. The first book in this trilogy is very refreshing, as we see this world through the perspective of someone new to it and get to learn about the world as our protagonist does. The series has satisfying arcs for most, if not all, of its' main characters, and a lot personality comes through for the side characters as well.<sup>2</sup>

This series isn't entirely without flaw, as it does use the "chosen one" trope as well as having a "childhood best friends to lovers" arc for one of the main characters. The "chosen one" trope is done relatively well though, all things considered, and doesn't consume the entire story. However, the "childhood best friends to lovers" arc is another story entirely. It only truly starts after one of the characters involved is killed, and so it's mainly done through the surviving character's memories. It has a tendency to come off feeling both as though the surviving character is simply romanticizing the dead character, and also as though it is only being developed to cause drama.

Overall, though, I very much enjoyed this series and would absolutely recommend it to anyone who enjoyed Star Trek, The Hunger Games, or any other future/space-based media. 9/10.

### THE THOUSANDTH FLOOR SERIES BY KATHERINE MCGEE

You want angst? I'll give you angst: this series. Fun fact: I read the second book in this series first and was very confused as to what was going on. Every single character in this series<sup>3</sup> has intense personal drama going on, and it's basically just teenagers over-exaggerating their own problems. This continues throughout the series, and it sounds like it could get exhausting. One of the main character's arcs does; but surprisingly the rest of them *actually develop* and they grow as people.

Now, from this description, it may sound as though I hate this series, but I actually find it to be a mostly well-executed take on common teenage issues mixed in with a wider overarching story that involves all of the main characters in some way. The one character I have gripes with is very much the Mary Sue of the story, who has pretty much everything: naturally, she wants the one thing she can't have. This is very frustrating to read when juxtaposed with one character who is dealing with the fallout of her mother's cheating, another who is trying to keep her scholarship while also raising her younger sister, along with other characters who have actual problems to deal with in their lives. This is probably the point of the character; this does not make her any less infuriating.

I keep describing the bad things about this series. I swear it's good! In the second book we get a new main character who's a con artist, and it's intriguing to see the rest of the trilogy explore her struggles with trying to truly belong when she has had to move and change identities every few months for what is basically her whole life. The overarching story involves all the main characters in one way or another, and the individual stories are (with the exception of the Mary Sue previously discussed) enjoyable and fulfilling in their own ways.

If you can get past the Mary Sue's contrived struggles, I highly recommend this trilogy. 8/10.



That's going to be a wrap for this article, along with this term's **mathNEWS** articles from me! I hope you've enjoyed the ride. If this is the first article of mine you're reading, I recommend you go back and read my previous articles. Good luck on finals, have a great winter break, and I hope you keep reading in the winter term!

*Sexy\_Software\_Babe*

1. I haven't had a lot of time to read recently and also adult fiction tends to be depressing. I know that's the point but I'm still a child at heart (N things list about why next term maybe??)
2. This is *very* high praise for a YA series
3. There are 5 per book and one of them leaves after the first book so you end up with 6 main characters to keep track of. Writing a book report on this thing was a nightmare.



# WHAT IS PELL

(TAYLOR SERIES' VERSION ♡)

[Lemma 1]

You walked me through the proof again, this one by induction  
But somethin' bout it felt like an incorrect deduction  
And I left out  $+C$  on my calculus quiz  
'Cause I still don't know what an integral is

[Lemma 2]

Oh, another contradiction, more binary strings  
We're moving onto groups, but I still don't get rings  
Racket comments useless now, lookin' so out of place  
But I still write 'em in, after all these days

[Lemma 3]

And I know it's long gone and  
That Desmos ain't here no more  
And I might be passing but I can't  
Code at all  
Oh, oh, oh

[Theorem 1]

'Cause there we are again, in MC CnD  
You couldn't get the proof 'cause you were lost at " $Z \bmod 3$ "  
Difference of squares, oh who cares  
Can't remember it, what is Pell?

[Lemma 4]

Algebra notes on the counter, they still don't make sense  
Used to be your high school's math champion, writing all the contests  
Now our prof's tellin' stories 'bout Gauss, and his work as a child  
Tells us 'bout the past, not knowing our code won't compile

[Lemma 5]

And I know my assignment's wrong  
No more problem sets that I could do  
And I forget about Calc 1 long enough  
To forget that there's still Calc 2

[Theorem 2]

'Cause there we are again in the middle of the night  
We're wonderin' why we can't use the derivatives of " $\cos$ " or " $\sin$ "  
It's not fair, oh who cares,  
Can't remember it, what is Pell, yeah

[Corollary]

Well, maybe we got lost at "summation", maybe I'm overthinking too much  
But maybe this proof was a masterpiece, 'til I wrote it all up  
A lecture with flair, I was there  
But I can't remember it, what is Pell?

And I code the whole damn function just for Marmoset to hate it  
So casually cruel, just 'cause of one incorrect "if-statement"  
I'm a horizontal asymptote lyin' here  
'Cause I can't remember at all, all, all...  
What's Pell?

[Lemma 6]

Squeeze Theorem won't work, I'm stuck with Epsilon-N  
I'd like to go back to Grade 12, do basic limits again  
After pink tie days and nights when division got long  
Now I just take a guess, even though it's all wrong  
But I keep my old proofs from that very first week  
'Cause it reminds me of innocence and the letters weren't yet Greek  
I can't get rid of it  
Or I won't remember it, what is Pell, yeah

[Theorem 3]

'Cause there we are again when I didn't get inversion  
Back before we failed the one assignment on recursion  
In despair, unaware  
Can't remember it, what is Pell?  
Difference of squares, oh who cares  
Can't remember at all  
It's not fair, oh who cares,  
Can't remember it, what is Pell

[QED]

In despair, unaware  
Can't remember it, what is Pell  
?

□

rickyspin

# NOBODY BY MITSKI

This song speaks to my soul. If someone asked me what song I relate to, this is the song.

Mitski's disco-pop song is an ode to loneliness. Themes of alienation and estrangement lace the song. This song depicts the feeling of being alone in a crowd. Yes, I am surrounded by people, but why do I feel like I'm the only one here?

Overall, I love listening to "sad" songs for their slow beat and passion. I usually never relate, but this one is different. I encourage you to listen.

panda1

P.S. The Hello Kitty content will come back!! In my next study term, I will write about my journal and Hello Kitty.

## AN $N > 0$ MESSAGE

Look, I get it, finals are coming up and you're burnt out with calculus proofs. You spherically huddled all weekend waiting for the clock to tick faster closer to December 22<sup>nd</sup> yet you feel guilt over not touching your laptop in hours. Even feeding yourself Kraft Dinner feels like too much to you at times with deadlines approaching.

I'm here to remind you of a few things.

1. There are campus resources out there to support you. I'm not the most knowledgeable on them, but we want to see you succeed, and your mental health is vital to that in the long-term, so please reach out if you need the help.
2. You are more important than your grades. If you fail, you can redo the course. Yes, it's a setback, but not a barrier to success. Besides, remember how far you have come! You're talented and you worked so hard for this, so don't be too discouraged by an unexpected result.
3. You are not defined by a bad grade. You aren't a subset definition, so be aware that your final mark isn't what matters about you. Like I've said, you're talented and amazing and a number doesn't even sum that up; it just tells you how well you did in that subject.
4. Take a break! There is such thing as too much studying, even when the campus culture stereotype is exactly that. Try to prioritize your mental health every now and then, whether that's a walk, a shower, or making yourself a lovely meal. You deserve it.

5. Talk to someone. Have a laugh with a friend or call your mom. Watch cute cat videos. You'll feel a little bit better with some oxytocin (at least that's what the science says)! It also serves as a reminder that you are not alone in this world, people are also feeling and struggling with you too. They are here for you.

Finally, this might be a bit of a tangent, but early in my MATH 135 lectures, to explain the importance of order of quantifiers, my professor gave these two examples.

*For all persons  $p$ , there exists a person  $q$  such that  $q$  loves  $p$ .*

versus

*There exists a person  $q$  such that, for all persons  $p$ ,  $q$  loves  $p$ .*

Regardless of their different meanings, they're both true as I am  $q$ . I am here for you (albeit through a **mathNEWS** article but I'm on Discord, you can find me). I care for you and your well-being so I wish you all the best this season. I just know you're gonna do great things, including on those finals, essay and outstanding assignments. Just make sure to put yourself first <3

Happy holidays, reader. I will hopefully see you more in the winter term :)

Dollar Store Person

## THE BEST ARTICLES

The best articles are the ones that make you laugh. The best articles are the ones that make you cry. The best articles are the ones you read first. The best articles are the ones you read last. The best articles are the ones you read multiple times. The best articles give you an existential crisis.

The best articles are the ones you share with your friends. The best articles are the ones your friends share with you. The best articles are the ones that you see other people reading. The best articles are posted on Reddit. The best articles are posted on the **mathNEWS** Instagram. The best articles get cut out and taped to a wall (or a piece of door). The best articles get framed. The best articles still get referred to years later.

The best articles are rewarded articles of the issue. The best articles are the ones that say hi to the editors. (Hi editors!) [*Editor's Note: OMG HII!*]. The best articles are "the" and "a". The best articles are meta and self-referential. The best articles reference other articles. The best articles are referenced by other articles.

The best articles are the "N things" ones. The best articles complain. The best articles lament. The best articles brag. The best articles parody other articles. The best articles are poems. The best articles are jokes. The best articles are the ones that can be read in a minute. The best articles take up an entire page. The best articles are shitposts. The best articles are high effort. The best articles are the ones that are written when the writer is panicking about not having any article ideas.

Initially, I planned on ending this article with "The best articles weren't written by me" but I think what I really mean is this: The best articles are written by you!

terminal



# MY YOUTUBE CONSPIRACY

## OR MAYBE IT'S JUST A GIANT COINCIDENCE INSTEAD

I use YouTube a lot and during all those years, I have noticed this one particular similarity or pattern way too often for it to not just be a coincidence. Weirdly, I have encountered way too many YouTubers or channels in general that are all linked to Vancouver.

Let me specify this further. I watch content from all over the world. English is a widespread language so all the anglophone countries get involved, and also the occasional videos in other languages, but almost always it's an English-language channel. Additionally, this doesn't come from me going out and specifically choosing channels or YouTubers to watch, who are in Vancouver or nearby. Sure, there are channels I subscribe to, which I did because they are specifically making content around local things, such as About Here or RMTransit, but I'm not counting these ones, since I started off already knowing they are from around Vancouver.

Instead, there are way too many channels or YouTubers whose videos I've watched for their content and only after some time has elapsed, I discover that they are from around here. Every single one of them was recommended to me in some way by whatever algorithm of the time. I did not go ahead and search for these channels myself. Let me give some examples.



I remember when JJ McCullough's channel was recommended to me, it was just like any other typical educational channel out there, and so it became a part of my subscriptions. Only later, via his video where he did a presentation at a Coquitlam library, did I find out he lived around here.

Electroboom is a channel I've also subscribed to, because channels that do cool stuff like that are apparently another thing I like. Again, I didn't know he was from here until much, much later. Interestingly, a little while back, one of his videos showed the view outside his window, and it was possible to find out where that was based on local map knowledge.<sup>1</sup>

Useful Charts is a channel run by people who indeed make useful charts and make educational videos out of them. At first, this was just another channel that could have been from any place in North America. A long while later, it turned out that one of them was Canadian. It's not a surprise. Turning out to be a Canadian rather than an American YouTuber does happen. You know, sometimes, differentiating based on accent can get a little harder between the two. But what sealed the deal was in this one recent video where the other one straight up said that he lived in the Vancouver region. That was a shocker. I was not expecting that to happen yet again. Then, it turns out that he now runs a Useful Charts store in Vancouver, open 4 hours a day every day of the week except holidays. I think I will definitely give this store a visit.

There was a period of about 2 weeks where for some reason the YouTube Shorts algorithm began to give me videos of people

riding their bikes down a mountain slope. At first, these videos seemed to be similar to each other. One channel's mountain bike Shorts was similar to another's. It could have been on any mountain for all I knew. Then one day I noticed in one particular video, some location details. These bikers were going down the side of Cypress Mountain! That got me really curious and I dug around their channels and found that these YouTubers seemed to ride their bikes often with each other. So, in the end, they were all from around here.

I think the biggest shocker was finding out that the Voros Twins are from the region. Who'd've think that the twins from that "Da Vinki?" meme would be from around here. The only reason I checked is when they posted a picture from Twin Falls (get it?) and it looked too similar to the one in the region, and only then I realized.

Of course, to end this non-exhaustive list, there's Linus Tech Tips. Now, I don't watch their videos often at all. Throughout the years, it was just a couple videos here and there. For this channel, I found out from my friends that they were based in Surrey. This one isn't quite like the others, but I'm including it anyway!

There are also other examples where YouTubers mention that they're from some other locale in BC, or channels that operate from somewhere in BC. Though, the rate of that happening is much lower. So far, it's just a couple of occasions. It's still less compared to just the region though.



This can't all be a giant coincidence, right? This happens often enough for me to think it is not. I think YouTube may be trying to recommend local YouTubers. It's not like Google doesn't know where you live, right?

Although, I have no idea how much perception gets involved. Perhaps someone living in Toronto instead finds themselves encountering a lot more YouTubers and channels based around Toronto instead? Perhaps this wouldn't be as surprising if I only mainly watched media of a different language instead. If I were to only speak and consume Swedish-language media, it wouldn't be surprising to be mostly encountering YouTubers and channels from Sweden. So, I guess it being English makes this more surprising than not.

...or Google is all-seeing and omniscient at this point and we should all be scared.

**boldblazer**

1. I'm really good at GeoGuessr specifically for the Vancouver region too. Also, this reminds me of another time, when news of a French-Belgian border stone being moved made the news, I managed to find the exact spot on Google Maps after carefully combing through French-language news footage.

# N SLEEPER PICKS FROM MY STEAM LIBRARY

I have many awesome games in my Steam library. So many that I can't possibly write about them all, so I thought I'd focus on some games that are really really good, but that I haven't really heard anyone talk about (outside of my high school friends, with whom I share a brain cell). These are my sleeper picks that you probably haven't heard about, but that you should check out!

**West of Loathing:** This game is a turn-based RPG where you play as a stick figure on a Wild West-themed adventure! It has a charming, drawn black-and-white art style, and wacky humour, and simple yet satisfying gameplay. Along with its recently-released sequel, *Shadows Over Loathing*, it's one of those games where I just have a blast every time I sit down to play it. It's also super light on the brain and doesn't require a lot of time for one sitting, so it's a great game to play even if your brain is tired and you don't have much time.

**Everhood:** This *Undertale*-inspired pixel graphics RPG takes on the tried-and-true strategy of plopping you down into a world with absolutely no information about who you are or what your goal is. All you know is that your name is Red and someone stole your arm. Obviously, a game that starts off this way has a banger story which I can't talk about without spoiling the game, but its main draw is its combat, where the attacks are in time with the music and every fight is a treat for the eyes and ears. It's also trippy as fuck and the people who made it were definitely high on shrooms.

**Inscryption:** It makes sense that people don't talk about this game too much, since there's not much that can be said about it without spoiling the experience. It presents itself as a deck-building roguelike with a morose, eerie feel. But it's so much more than that. Let's just say that the creators made an ARG outside the game, that should tell you what you're dealing with. Oh, you have no clue what I'm talking about? Only one way to find out! Go play it.

**To the Moon:** This game was recommended to me by my 7<sup>th</sup> grade teacher Mr. Godfrey, and that guy is an absolute legend. In this game, you play as two scientists from a company called Sigmund Corp, and your job is to go into the minds of people who are on their deathbeds and alter their memories to fulfil their greatest wish. In this game, you enter the mind of Johnny, whose greatest wish is to go to the moon. It's a more story-focused experience, and the gameplay is relaxing and mostly consists of walking around and looking at stuff. And crying. It is a story-rich, emotional experience that I can guarantee you'll never forget until you're dead. There are also two more games after this one, *Finding Paradise* and *Impostor Factory* (sus?????) both of which are incredible as well.

**Fez:** This is a cute puzzle adventure game where you play as a little guy with a fez who gains the power to be a 3D boi in a 2D world. Fill out your map, decipher secret codes, and solve puzzles. If you can beat it without looking anything up, I will be extremely impressed because some of the stuff in this game is incredibly difficult to figure out.

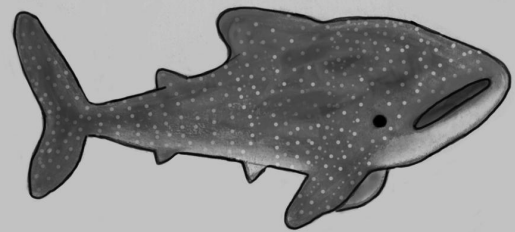
**Bombe:** This game makes me feel like a fucking moron. Fuck this game. I love it! It's Minesweeper, but you don't actually solve the levels like some plebeian. Instead, you create rules to get the computer to solve it for you. Some rules can just clear or mark cells, but you can also create rules to mark how many mines are in a certain region, which can then be used in future rules. As you complete more levels, you can unlock more game mechanics, and some levels have literally not been solved by anyone.

**Human Fall Flat:** In this game, you play as a lil guy walking around in a low-poly world, and the gameplay is very silly. There's a button for each of your arms to reach out and grab stuff, and you can interact with anything. Each level has platforming and puzzle challenges that are super fun to complete. It also has multiplayer, a soundtrack that has absolutely no business being as good as it is, and the game is regularly updated with new levels to play, meaning you'll always come back to it eventually!

**Tunic:** This game is fucking incredible. It's a *Zelda*-inspired adventure through a strange world. Throughout the game, you collect pages of the game's instruction manual. That's right, the instructions for the game that you are playing... in the game. It's as weird as it sounds. Also, it's written in a language you can't read. The atmosphere and combat are incredible, and my friends all say they wish they could play it for the first time again. But you can do that right now!

someBODY

## WHALE SHARK!



Moon

# TROMBONE SUPERIORITY

In contrast to what the title suggests, tubas are better than trombones. However, trombones are much more thoughtfully designed than any other brass instrument, and here's why.

First of all, trombones are simple: they're just really long tubes with a section that can be moved back and forth to make the tube longer, so it intuitively makes a lot of sense how it works. With other brass instruments, especially larger ones, you have to follow the tubing to find the amount of tube length each valve increases the length by, and no one wants to do that. Also, those instruments require so much looping and turning of tubes, adding extra air resistance with every corner the air has to turn. Trombones have two 180° turns in total (bass trombones have more, but it's so worth it). Trumpets, baritones, tubas, ophicleides, and especially French horns, have way more, but we'll get back to French horns.

The main benefit of trombones, however, is way more important than that. It's that trombones don't have issues with pitch variance as the notes get further from the center of its range. To explain this, we'll have to go through some high school physics, but don't worry, it's not anything too difficult to understand. Firstly, we have to understand the frequencies of pitches that are used in Western music. Instruments are typically tuned to  $A_4 = 440$  Hz, and each note is double the frequency of the note an octave lower with the same name. The pitch of notes then follows a logarithmic scale, with  $F(n) = f \cdot 2^{n/12}$  where  $F(n)$  is the frequency of the desired note,  $f$  is the frequency of a reference note (usually  $A_4$ ), and  $n$  is number of semitones above the reference note that the desired note lies. So as the pitch goes up, the difference between the frequencies of notes increases, and as the pitch goes down, the difference between the frequencies of notes decreases. Most brass instruments try their hardest to accommodate this, but they fail after a while. Not trombones. While other instruments are stuck trying to find a combination of preset tube lengths that gets close to a harmonic series with the note they want, trombones just move their slide a tiny bit farther to get closer in tune.

Many instruments have tried to mimic the amazingness of the trombone's tuning, but they all break down at some point. Many instruments just add another valve with a length that's carefully chosen to increase the accuracy of as many higher/lower pitches as possible but, of course, there are extreme notes that still aren't pitched properly. Many trumpets take the approach of mimicking trombones by adding their own slide to the first and sometimes third valve's tubing. However, in my experience this is just a pain to use properly because you have to press valves and simultaneously remember when to move the slides and exactly by how much; but, also, that you sometimes have to do that with two slides at once, which have to be moved to a precise position that is different for most notes. Trombones are much easier to use: you can very easily find the position of the slide by estimating based on the regular position plus a bit extra or a bit less depending on how much higher/lower the pitch is from the instrument's center of range.

I think by this point it's very clear that the trombone is a superior brass instrument in terms of how its sound, and that other instruments can only try to mimic its amazingness.

If I got you hooked on trombone superiority, then here's a few super cool recommendations of interesting trombones to look into. Bass trombones are cool because they have key(s) to help them achieve lower and more convenient notes; they also fill a gap in the range of a typical tenor trombone which can play as low as  $E_2$  but no more notes until  $Bb_2$ . There's also the contrabass trombone, which has two keys to increase the trombone's range, allowing many scales to be played with only three slide positions. Soprano trombones are cool because they're small, but probably also kind of hard to play. A valve trombone kind of defeats the purpose of a trombone because it's basically just a long trumpet. The superbone is cool because, aside from its cool name, it plays like a combination of a tenor trombone and a valve trombone for a more diverse playing experience. There are also cimbassos, which are giant bent trombones that use rotary valves and sound like tubas; they're forgiven for having valves because they're just so cool. The tenor valve trombone is a super rare type of trombone that I'll just let you look into for yourself. Finally, we have the *tromboon*, which is a combination of a trombone and a bassoon. You can make one by sticking a bassoon bocal into the hole for the trombone's mouthpiece. There's no comfortable way to hold it (trust me I've tried a lot), it makes a very screechy timbre, and it's very inconvenient to use. As a bassoon and trombone player I've had the absolute pleasure of playing the tromboon in the past and I truly believe that it's something that every bassoonist must play at least once in their life.

Mediocreasgold

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## POLORIZERS APPRECIATION POST

Thank you to an awesome inner tube water polo team! I'm definitely feeling sentimental after our last game and an incredible season. We improved so much since the spring term and I'm very proud of everyone on the Polorizers. While I think we're pretty good, even during our worst games, I had so much fun taking a sport where people paddle around in inflatable tubes super seriously. Some people may say that it isn't a real sport, but some people also haven't known the triumphs and defeats, the epic highs and lows of intramural inner tube water polo. If you're reading this and are intrigued, I implore you to consider trying the sport, it's a lot of fun. Looking forward to next season! We'll polarize the fuck out of you!

*Disclaimer: the last sentence is our team cheer and not a threat directed towards mathNEWS readers.*

peacelovemath

# profQUOTES

## ECON 101: MIKAL SKUTERUD

- “ There’s a prime business opportunity here. You merge the Pita Pit and the Tokyo Smoke into one store, call it the Pita Smoke. People will come to smoke a joint, and then they’ll think, “I should buy a pita!”
- “ Nobody’s tried mushrooms? Really? I thought all the teenagers were doing mushrooms these days!
- “ So the government was like, “we gotta help these people or the whole economy could crash if all of a sudden people have—” Wow, there are two massive turkeys in my backyard. This is crazy, I have to show you this, guys.
- “ Wow. This is really a strange day. There are two big, wild turkeys in my backyard here. Maybe I should let out my dog and see what happens. I have never seen that before. What a strange day. Holy moly.

## STAT 240: YINGLI QIN

- “ You will receive your midterm 2 tonight. Whatever happens, do not cry.
- “ The class size is 67... for now.

## ECE 105: MATTHEW ROBBINS

- “ Are you a point mass?
- “ Cylinder, cylinder, cylinder, cylinder, and a sphere for a head is a reasonable approximation for a human.
- “ It’s an inelastic collision: the child is colliding with and sticking to the spinning metal disc.
- “ I have a baseball bat... that is either a threat or a statement of fact. I’m gonna swing this baseball bat, and I will hope nobody will walk in the door.
- “ I am going to... no, I am not going to do that, there’s liquid in it.
- “ I know, I’m really sorry, I’m not gonna put my life in danger this time.
- “ If I have 27 hinge forces... at that point I break down and I don’t want to solve the problem.

- “ Give up... that’s always an option.

## MATH 115: RUIKUN ZHOU

- “ If you do not write this, the TA will not know where you got it from—probably from someone else’s paper.

- “ If you master this, you are guaranteed one mark on the final.

- “ You will be able to factor it into linear terms. But if we want to lower the average...

- “ I don’t like this RREF stuff.

- “ I guarantee some of the students in this class will get this wrong on the final exam... I was one of those students.

- “ Your feedback is important for me, just to improve myself... probably.

## MATH 117: ELANA KALASHNIKOV

- “ Things have gone from bad to worse.

- “ They are equally difficult, or optimistically, equally easy.

## CS 137: VICTORIA SAKHNINI

- “ Python moment.

- “ There’s nothing we can do about it.

- “ You can easily prove it by induction. [*Students groan*] I will give you a moment to release some steam about MATH 135.

- “ I thought you wanted to see how I look when I’m angry, but maybe not.

- “ I could easily look at the first row and figure out who is the most handsome person.

- “ Please tell me if I make a mistake. Don’t be that mean—I haven’t finalized the final exam yet so I can still retaliate on that part.

- “ So we kill the children first and then we process them.

## SE 101: PAUL WARD

- “ It’s important to get drunk.

- “ You will not get negative marks on an exam, even if the instructor looks at it and thinks, “Oh my god I wish I could give negative marks”.

- “ Is anyone planning to work for the rest of your life? Apart from me. [*Student: “Why?”*] I’ve got a wife and kids to avoid. What’s your excuse?

- “ Nowadays the correct solution is you stick your phone in a Faraday cage.

“ Clippy has died but he lives on in our memories... Why do I get the horrible feeling that Microsoft is going to resurrect Clippy and make him part of ChatGPT?”

“ Our IT staff cost at least \$3 an hour, and we don't like paying people \$3 an hour, so we're going to fire them all.

“ Some of you students slightly terrify me.

“ Nothing in life is worthwhile.

“ Set up a meeting with me in which I will get my role of “daddy” on... if you've been naughty.

#### CS 245E: SHAI BEN-DAVID

“ If you make this mistake in the exam, you'll get punished heavily.

“ To go back to my favourite example, you go to a dating application and you list all the requirements you want—*all* of them—and you find someone that satisfies them, but then you meet them and you're like [*gagging noises*].

#### CS 246E: BRAD LUSHMAN

“ I've ruined these students.

“ Here we discover how much of the code we've built amounts to absolutely nothing.

“ You really only want to make friends with someone that can do something for you.

“ If I say that you're my friend, that doesn't also make me your friend.

“ Let's say you and your friend are sitting on a couch, where, in this context, you and your friend denote functions. But anyways, you're having a pleasant conversation, and at some point—I'm sure it was entirely accidental—you say something that deeply offends your friend, who yells “I take exception to that!” Rather than have a civilized response, your friend grabs the nearest thing to them they can find, which hopefully is something light, and not... like, I don't know, a statue or something, and throws it at you. You have a relatively strong sense of self-preservation, so you duck, but the problem is that next to you is the end of the couch, and next to that is a table which has a fairly expensive lamp on it, which falls onto the floor with a crash, at which point you are removed from whatever establishment you were in, so the interaction is over. The point is that the object was difficult to ignore.

“ The voice in your head might say to you, “come on, you know in your heart of hearts you're a Racket programmer.”

“ Everything we do is a concept—but not a concept concept, just a *concept* concept.

“ This is the point where the course stops being CS 246E and starts being CS 246D, where the “D” stands for “difficult”.

“ Rather than confuse myself, I'll confuse *you*.

“ The minute they do that, C++ becomes an interpreted language which is kinda funny.

“ [*Neighbouring room starts clapping*] I don't know what they do in that other room, but it must be pretty awesome.

“ What if I hate languages that start with J so much that, in my constructor I replace any topics starting with J with “garbage”?

“ If a class has no objects and falls in the woods, does it make a sound?

“ Compilers don't actually have conversations with me.

“ There are very few people who understand multiple inheritance, and by the end of this class you won't be one of them.

“ If you're on a weekend and have some free time, and you would like to consume some entertainment, you do not say “I would like to see an abstract source of events.”

#### MATH 249: DAVID WAGNER

“ The proof of this is an *exercise*: my favourite proof technique.

“ Its like ten years ago everything was quantum, and now it's exponential.

“ I used a fountain pen in undergrad, but only because I had a crush on a girl who used a fountain pen.

“ This is gonna be a monochromatic talk.

#### MATH 247: SPIRO KARIGIANNIS

“ I just need two more lines. It would be a tragedy to stop here.

“ I did not want to let you guys know how I was up from 3:55.

#### CS 341: RAFAEL OLIVEIRA

“ You need to figure out the existential question: “Am I stupid?” If we're all collectively stupid as a human race, that's fine.

“ Make this abstract nonsense into a concrete somesense.

“ I need my two for loops for breakfast.

**CS 245: LILA KARI**

“ I’m the problem, it’s me.

“ I don’t know about you, but in grade 5, we had to formally prove geometry using Euclid’s postulates. It was so bloody hard.

**CS 241E: ONDŘEJ LHOTÁK**

“ Whenever something is hard, you just put it in a procedure, and leave it to someone else to implement that procedure.

“ And then we get to Assignment 11. Sorry, that wasn’t supposed to be an evil laugh.

“ Before you do the assignment, just look it up on Google so you don’t have to do the work. (Don’t try this at home.)

“ What I need is an infinitely tall blackboard. I’ll make a virtual infinitely tall blackboard by moving sideways.

**PSYCH 101: TONI SERAFINI**

“ Should I put “learned to walk at 6 months” on my resume?

“ I’d like to think I suffer from sleep deprivation, but I don’t think I do.

## HOW MANY ENGINEERS DOES IT TAKE TO CHANGE A LIGHTBULB?

**NONE; THEY’RE TOO BUSY ENGINEERING PEACE WHILE THE REST OF US ARGUE IN THE DARK.**

The darkest place on all of Waterloo’s campus is the bathroom in E2, room 2162; it’s the most haunted attraction of the modern world. This bathroom houses three luxurious showers, lockers, and a lightswitch, that with one flick, unleashes the darkest darkness imaginable. Previous visitors have likened the gloom of this void to that of a blackhole. If it weren’t for engineers, everywhere—MC, Paris, the Great Hall<sup>1</sup>—would all be as gloomy as that dreaded washroom in E2. Everywhere. I’m serious.

Yet, these engineers can’t do everything! Certain places are still dark because they’ve yet to be touched by an engineer—showers, for instance. If there were no engineers, there would be no E7 bridge! Imagine that! I’m shivering in my boots just thinking about it.

What’s more, darkness doesn’t only manifest itself in physical ways. There’s plenty of internal heart-wrenching<sup>2</sup> darkness in people’s lives that is illuminated by the wonders of engineering. Look at social media!!! It makes us *so* happy; with all the detachment from reality that it offers, we can fulfil any fantasy<sup>3</sup> we want—and share it with others across the world.

There are so many types of engineering: reverse engineering, sanitation engineering, social engineering, and more! Each one contributes in different ways—sanitation engineering helps ensure that sewage isn’t on our streets! They also engineer cost-efficient and environmentally sustainable solutions to promote sanitary waste management for those in countries with fewer resources. Imagine if you didn’t have access to toilets and bathrooms!<sup>4</sup> We take these things for granted. *That* is peacebuilding.

For the mathematically inclined, consider the following proposition:

$$\forall x \cdot \text{changeInWorld}(x) > 0 \implies x \in \text{Peacebuilders.}$$

If you just barely passed MATH 135, the statement reads: anyone who causes a positive change in the world is a peacebuilder! In fact, we’re all peacebuilders,

$$\mathbb{U} \subseteq \text{Peacebuilders.}$$

That’s right.  $\mathbb{U}$  are a peacebuilder;  $\mathbb{U}$  rock!



Humanise Chisel

1. In Grebel, obviously
2. Get it? 60” wrench
3. Even *dark* ones!
4. SHOUTOUT WORLD TOILET DAY: November 19, every freakin’ year

**Send more profQUOTES.**

THE ENTIRE mathNEWS READERSHIP



# JUST ANOTHER WESTERN VICTORY!

## VERITAS ET UTILITAS

Ross Willard is retiring! Rumour has it that this is his last teaching term :( I totally did not spend hours of my life reading every **mathNEWS** issue published in the past 20 years collecting his best Quotes about the University of Western Ontario. Anyway, here are his best quotes about University of Western Ontario:

- “ Western is known for its, well I don't know, relatively wealthy students—and relatively vacuous brains.
- “ At Western, hands will go up—“uh, sir, can you explain that?”
- “ You learn this in kindergarten. Students at Western might learn this in grad school.
- “ *[on linear combinations]* Western students would be trying to parse, “What chemical compound is  $0 \cdot v_1$ ?”
- “ You all know what this means right? You are not students from Western.
- “ I think Western students can do that.
- “ I will, from now until the end of the term, bash Western repeatedly.
- “ What fuels your disdain for Western? ...C'mon, are you serious? It's WESTERN!! Sheesh.
- “ If you're at Western, you give up now.



While I was going through all the **rossQUOTES** from the past 20 years, there were some amazing quotes that I really didn't want you to miss. As a reward for you reading this, I put them here.

- “ *[Comes to class wearing a T-shirt with the words “mean little man with no teaching or math skills”]*
- “ How many of you have heard of Pavlov and his dogs? You will become Willard's dogs. 🐕
- “ Are you pro-choice or anti-choice? Are you pro-axiom of choice or anti-axiom of choice?
- “ I can pull off this lecture! It's my birthday! *[Writer's note: He later gave 100 to everyone because it was his birthday. Based.]*
- “ Students: But sir, how many children HAVE you sired?  
Willard: It depends on the definition. Somewhere between 2 and 6.
- “ Sorry I'm late. Professor Jao accosted me in the hallway.

- “ Oh my God! I'm brilliant! I set this up that way, didn't I?
- “ I made **profQUOTES**! Yay!
- “ I will tell you the truth. Some pure math profs are evil. Fortunately, I'm not one of them.



Capt. Benjamin L. Willard

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## LAST WEEK I BOUGHT MY FIRST MENSTRUAL CUP

and I don't think I am ever going back to wearing pads.

At first, it felt like it was too much. On my first time inserting it, I was nervous and thought that not feeling it bother me at all while I stood up, squatted down, moved around and whatever, meant I had done something wrong. *[Author's Note: It didn't.]* Then when I tried to “fix” it, I spent terrifying minutes without being able to take it out and thought it got lost somehow. *[Author's Note: It literally had no place to go, lol.]*

But by day 3 of using my menstrual cup, I had become a master of inserting, making sure it had properly opened up, and taking it out. I even felt comfortable with cutting off the stem entirely, which used to hurt a little. This did make it harder to localize it sometimes, but when I couldn't reach it, I simply “birthed” the cup out, using my pelvic muscles, which sounds worse than it actually is. Staying calm is key, but then it really is a painless and easy process.

As someone not easily grossed out by my own body—having no problem with pouring my own blood in the toilet or putting my hand “up there”—it feels really good to be more environmentally friendly and simultaneously make an investment that will save me money for a decade<sup>1</sup>.

BiMath

1. Yes, menstrual cups last for about ten years! I am going to save so much money 🙌

# WHY YOU SHOULD HATE GLENCORE

## FEATURING ACTUAL NEWS!

The headline “**Teck Resources to sell BC coal mines to Glencore**” is not the most intriguing one. The coal mines part may stick out to any environmentalist among us or those who care about climate change. However, upon reading this, I was filled with so much rage I could only contain it by writing a **mathNEWS** article. Together, we are going to pick apart this sentence to really understand what is going on, and I will endeavour to make you hate Glencore.

### WHO IS GLENCORE?

The name sounds innocuous enough. It's giving generic corporate entity. Glencore is a Swiss multi-national commodity trading and mining company.<sup>1</sup> Basically, they own a BUNCH of mines and sell all kinds of minerals and metals. They're absolute bastards. Here are all the controversies of Glencore.

### THE SELECTED CONTROVERSIES OF GLENCORE

When I say “all,” I lied. Here is only a selected amount of the easy to find controversies. There are so many more that I could add. (Like the Columbia paramilitary stuff...that's wild and there wasn't enough room for it.)

- Since 2010, Glencore has been involved in over 70 allegations of human rights abuse according to the nonprofit Business and Human Rights Centre.<sup>2</sup> This includes hits like corruption (more on that later), dangerous working conditions including extreme heat in its Congolese cobalt mines, and not providing sufficient water for its workers in said mines.
- It owns the Mopani Copper Mines in Zambia. In 2013, this mine was caught polluting at over 70× the limit for sulfur dioxide. Yet Glencore received no fines or disciplinary action. Again in 2014, 7 people were hospitalized from sulfur emissions.<sup>3</sup>
- In 2013, Glencore signed an agreement with the Moroccan government to drill for oil offshore in the Western Sahara. However, Morocco does not control this region and the UN does not recognize Morocco having sovereignty over the area. This made the offshore oil claims illegal and highly controversial. Glencore owned 2 licenses and explored for oil in the areas until 2018.<sup>4</sup>
- An Australian subsidiary of Glencore was implicated in the 2018 Paradise Papers. The subsidiary converted over 25 billion dollars of currency to avoid paying taxes in Australia. While this technically isn't illegal, it's super sketchy. Interestingly, Glencore is one of the largest clients of the main company indicated in the Paradise Papers, Appleby.<sup>5</sup>
- In 2022, Glencore pleaded guilty to artificially manipulating fuel oil prices in some of the busiest shipping ports in the US. According to the US

Justice department, Glencore “agreed to pay a criminal fine of over \$341 million, pay forfeiture of over \$144 million, and retain an independent compliance monitor for three years.”<sup>6</sup>

- Last, although certainly not least, Glencore pleaded guilty to a bribery charge in 2022. This included paying over 1.1 billion dollars to multiple governments over the world. Once more, the US Justice Department states, “the charges in the FCPA matter arise out of a decade-long scheme by Glencore and its subsidiaries to make and conceal corrupt payments and bribes through intermediaries for the benefit of foreign officials across multiple countries.”<sup>6</sup> Fucking yikes.

You may say this is just the price of doing business. Does it have to be? I believe that a company that made 31.4 billion USD in 2022<sup>7</sup> can afford to better monitor the working conditions at its mines and subsidiaries. And ideally not commit crimes.

### WHAT IS ACTUALLY IN THE NEWS

Now for the actual news section.

The coal mines that Glencore is looking to purchase are located in the Elk Valley. These are a series of metallurgic coal plants in British Columbia. Metallurgic coal is not actually used to make energy or heat homes. Instead, it is used for creating steel and other metal alloys. Don't be fooled, the coal is still being burned and polluting the environment. What is interesting (read: awful) about the Elk Valley coal mine is the rock the coal is hosted in contains minerals with large amounts of selenium in it. Selenium is element 34 on the periodic table and it is needed in very small amounts for human life. *However*, it very quickly becomes toxic to human, plant, and animal life in larger amounts.<sup>8</sup>

When the rock is mined for coal, the selenium in the waste rock gets exposed to the weather. It is especially soluble, so rainwater easily washes the selenium into the nearby rivers. This greatly impacts all species that rely on the river. Birds in the area have weaker shells and more of their young die. Excess selenium can cause deformities in baby fish. Even plants are affected, since too much selenium can cause aquatic plants to grow brittle and slower.<sup>9</sup>

You may be thinking, “This is awful,” and “Nobody should be allowed to do this.” Let's get into some legal guidelines. The government of British Columbia recommends that selenium be no more than 2 parts per billion (ppb). However, a recent study by USGS found the selenium levels downstream from the mine to be 5.77 ppb. Considering this was far downstream, the actual water near the mine is much higher. But that doesn't even matter! The BC government actually allows the river around the mine to have 19–63 ppb of selenium<sup>10</sup>. And yet! Teck Coal paid a 16 million CAD fine last year for failing

to have a water treatment plant built for the mine discharge water.<sup>11</sup>

This isn't even a Canada problem, the river goes straight to the United States! And *they* have issues with us polluting the water!!

### SO NOW WHAT?

Glencore sucks and we should all hate it. Sure, many mining companies are unethical, but this one is a top-tier bastard. Can we trust a company with such a poor ethics record to take over ownership for a massive contamination problem in the making? I wish I had something you could do to help, but at least we can all be angry together.

### rockfacts

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4. <https://wsrw.org/en/a105x4043>
5. <https://www.theguardian.com/news/2017/nov/05/glencore-australian-arm-moved-billions-through-bermuda>
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7. <https://www.glencore.com/media-and-insights/news/preliminary-results-2022>
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9. Eteieb, S., Magdoui, S., Zolfaghari, M., Brar, S., 2020. Monitoring and analysis of selenium as an emerging contaminant in mining industry: a critical review. *Science of the Total Environment* 698, 1–14 <https://doi.org/10.1016/j.scitotenv.2019.134339>
10. <https://thenarwhal.ca/glencore-teck-elk-valley-coal-mines/>
11. <https://www.cbc.ca/news/canada/british-columbia/teck-coal-administrative-penalties-fording-river-pollution-1.6741917>
12. woah you read all the citation that's wild tysm <3 also shout-out to USGS and The Narwhal for being the best

## THINGS THAT I HAVE DONE INSTEAD OF STUDY FOR FINALS

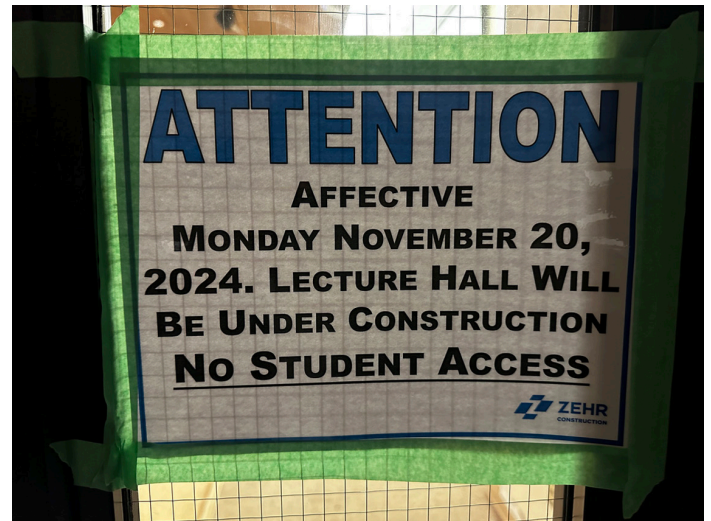
- develop a crippling addiction to Old School Runescape with their limited-time Leagues event
- help

## THE HOUSING CRISIS HITS UW

Monday, November 20. It was a regular Friday when we saw it. The sign in front of our home(s) saying that students cannot access the room anymore. MC 206x, our favourite lecture halls, our homes are gone. Ever since 1A, they were the place my friend group hung out at. The rooms were great for the following reasons:

1. Proximity. MC is like the best building to be at for objective and subjective decisions and the rooms were just right there.
2. Great Blackboards. Best on campus.
3. Always available. The rooms had technically been "in construction" for a few years so there were no lectures there ever.

Even though they were isomorphic in spirit, 2066 was slightly superior than 2065 (but that doesn't mean we didn't love it). We have a 206x channel in our group server where you can just put in which room you're in and people will join you. It was our go-to spot. But now it's gone.



They actually started the construction. And we see the rooms being ripped apart more and more every day. And the worst part is, they are not coming back the same way. After construction, they will actually host lectures in there and they will lose their best quality.

It is ripping us apart. We don't know where to hang out anymore. The amount of time we spend together has decreased significantly. And I don't know what's gonna happen. All I know is, I hate this.

List of affected writers: amirdadp (of RAC2), terminal, hyperlynx, RapidEyeMovement, thirdoffive, nazz, aqsr, and of course:



# THE LEGENDARY MECHANIC SPOILER-FREE REVIEW

## SYNOPSIS

The *Legendary Mechanic* is a Chinese web novel about a player getting transported into the world of a popular video game called *Galaxy* as an NPC with a player interface. Using the knowledge that he has about the game, he levels up, clears quests, and interacts with players as an NPC.

## REVIEW

Although the premise sounds boring and overdone, TLM is executed extremely well. Although its main genre is action/adventure, it has a ton of comedic moments that made me laugh insanely hard. It's not a story to be taken seriously, so there aren't many deep or dark underlying tones prevalent in the story.

One thing about this story that stands out is the main character. As someone who is transported into a video game, he doesn't really take any form of relationship very seriously. In fact, he sees everyone as leeks, where he can help develop them, then use them for his own benefit. There were many times in the story that the main character uses an NPC for his own benefit and then suddenly leaves to go to another place, throwing all of his burden onto someone else to take care of. The MC also treats the actual players the same way. By getting players to buy goods off of him, he can take their gold and experience for his own use. Because of that, he tries to fatten the players up by giving them quests, then selling tons of goods to the players. Although the MC seems like an asshole, his calculative and shameless personality makes some hilarious moments at times, and seeing how he interacts with other people is one of the best parts of the novel.

Because the MC has a video game system where he can level up, there isn't much suspense in the story. In *Galaxy*, if you kill a powerful enemy, or a boss, you get randomly get one of their abilities or skills. And there are "character summon cards" where you can temporarily use an NPC's skills and abilities. Since the MC gets his levels and skills so easily, we know that he won't lose nor face a setback, since he has endless trump cards. Some might find the lack of suspense with regards to the main character as a downside, but the plot itself was really intriguing due to the conflicts in the world and the suspense coming from the side characters.

One critique that I do have is about the side characters. Although I do really like how some side characters who you are introduced to in the first ~100 chapters are relatively prevalent in the story until the end, there isn't much character development among the side characters in general. Sure, their plot lines get resolved, and they do develop in terms of power scaling, but their personality doesn't change much or at all throughout the story. There are a few exceptions of course, but that isn't true for the majority of the side characters.

The world itself is structured similarly to a normal power fantasy novel. You start off in a small place, then the world

gets bigger. And bigger. And bigger. In TLM, you start off in a country, then the MC travels the world. Then he leaves to go to space and the solar system. Then the galaxy. Then the explored universe. As the scope of the world gets larger, that doesn't mean that the quality of the world building decreases. As the setting gets bigger, the time spent in the enlarged setting also increases. Because of that, the author is able to fully flesh out the world, characters, and various conflicts within it.

As the world increases, so do the stakes. One thing that I like about this novel is that it's not all about fighting. Although fighting is a major part of the novel, as the world gets bigger, the MC stops trying to do everything alone and starts relying on other people and building an organization. Because of that, he not only has to fight, but also interact with various government officials and corporation executives to grow his organization. This leads to a lot of political tension and drama going on in the novel, as each faction has their own particular set of interests in mind. Although there are a lot of people that are high-level and strong, it doesn't mean that they are invincible. An incredibly high amount of spaceships and low-level enemies can still wear down and kill a high level combatant. Thus, even though the MC and people on his level are incredibly powerful, they cannot do everything alone and have to act with both their organizations and the enemy organizations in mind.

However, since the world and plot continually increases, this makes the novel fairly long. TLM is about 1460 chapters long, with each chapter consisting of ~2000 words. A lot of my friends found this a bit off-putting, but in my opinion it's so enthralling and captivating that you just cannot put it down, so I have no complaints about the length. Not only that, unlike other web novels, the author doesn't dump a bunch of information or try to stretch the word count by repeating the exact same thing over and over again. Because of that, it doesn't get boring or repetitive. And because its only 1460 chapters, you don't really get burnt out from reading it, as opposed to if it was 2000+ chapters.

In conclusion, TLM is an amazing novel, with an expansive world, an intriguing plot line, and interesting and hilarious characters. There aren't many complaints that I have about the novel, with the exception of the side characters. On the contrary, I have a ton of things that I love about it. I think this is definitely worth a read if you are bored and want to kill some time, since time absolutely flies by when you are reading this novel, and you cannot put it down.

## VERDICT

9/10.

Fried Rice

# A LOVE LETTER TO SEASONAL ANIME

Most people who know me know that I watch a lot of anime. I also watch a lot of anime at once, and yet I don't stay up late binging or lose sleep over my seeming obsession. The secret? Seasonal anime. For those who are unaware, the anime industry works on a schedule of four seasons in a year, conveniently called winter, spring, summer, and fall, with individual animes being broadcasted weekly during their airing season. In other words, whatever is coming out right now is seasonal.



## THE BENEFITS

There are many benefits to almost exclusively watching seasonal anime. One of the main ones is that it prevents binging. It is physically impossible to binge a show when half the episodes haven't even been made yet. Another benefit is having something to look forward to on certain days of the week. Right now I'm writing on a Wednesday, and I cannot wait to get to my Wednesday show. Next prod night will be a Monday, and I will have probably already seen my Monday show. It adds consistent variety to the week.

One thing that I also love about it, which others may consider a downside, is waiting. Now, I love to think about what I'm watching. I love looking at what I consume critically, and also the suspense. I find that binging means that everything goes by so quickly it's hard to process the thematic and subtextual material, so the week of breathing room gives me plenty of time to ponder what might be interesting to focus on in upcoming episodes. And the suspense. Cliffhangers don't hit as hard when you can just move on to the resolution in less than 20 minutes. Some people hate waiting, but I personally enjoy not having all the tension released instantly.

Another surprising benefit, reduced watch time. It is just really hard to watch more than seven shows at a time while maintaining investment. This means that watch time is naturally capped at about three hours a week. I know people who can watch three hours in a day. Heck, I can watch three hours in a day when I have something that has already come out. But when I'm watching seasonals my consumption is regulated, which leads to it being quite a healthy and sustainable relationship with media consumption.

## THE DRAWBACKS

I just don't really watch the classics. Now, you can easily remedy this by just watching things that have already come out. But I do not. This means there are things that almost everyone has seen... except me. It also means that watching something that isn't a seasonal takes longer, but I'm perfectly fine with that.

Sometimes you also get duds when choosing what to watch, but you can always switch those out if that bothers you.



So that's why I love seasonal anime. You get to watch so much while also not wasting time and getting a deeper experience. And hopefully I've convinced you to join me so I'll finally have someone to talk to about all the shows I'm watching.

別

# SOMEBODY HURT MY INDEPENDENT GROCER

If Andrea Bailey of the Waterloo Chronicle is to be believed, Bob's Your Independent Grocer (né Bob's Valu-mart) was born in November of 2002, replacing a Zehrs at Waterloo Town Square. Twelve months later, I too would né.

In that way, I've always thought of him as family. Perhaps not as warm and close as corporate family—having not been under his direct employment, I cannot speak to his compliance to the Canada Labour Code—but family nonetheless; the sort of family that puts carts back for each other, sometimes I for him and at least equally him for me.

It's a little odd for a franchise owner to man an aisle. Maybe it speaks to his character. Maybe he's understaffed. Or maybe still it's not odd at all. I don't know, I found it odd. I think I've gotten used to it.

I'm not sure I'm used to seeing him in a cast though. Who broke Bob's arm? Who hurt My Independent Grocer?

h

# DOOR SWINGING SHUT

Another term wraps up with another volume. I have just one left here now. Everyone back home has already graduated, but it doesn't feel like I've had enough time.

But this time around, against my best efforts, it feels like I'm really drifting away. I'm making almost no new friends anymore, and struggling to be open and talkative with the ones who I do have. There are moments of hope, and those are genuinely amazing, but now isn't one of them. How is it possible that as university approaches its end, I feel more lonely than I did at the start?

I'm a natural optimist, and I haven't lost hope or the will to keep trying yet. And I will keep trying, and maybe a term from now, I'll feel better about it all than I do now. But I'm worried I won't. I'm worried more time won't help, in the end.

yet another waterloo goose

# N POTENTIAL VARIANTS TO mathNEWS

## DIVERSIFICATION CAPTURES MARKET SHARE

- **bradNEWS**: news about Racket, C++, Zelda and curling.
- **evanNEWS**: 100 pages of the word Evan over and over. [*Editor's note: what*]
- **jermaNEWS**: germs, jerma, jeans, and german.
- **MATHnews**: **mathNEWS**, but with inverted casing for all characters.
- **newsNEWS**: actually good news, instead of whatever the h this is.
- **ideaNEWS**: contains article ideas, so you actually have one.
- **racketNEWS**:  $(\lambda (x y) (* (x x) (y y)))$ .
- **editorNEWS**: a minute-by-minute detailed description about the lives of the **mathNEWS** editors.
- **celeNEWS**: news about celeste, celery, celesta, celebrations, and celestials.
- **gordNEWS**: news about Racket, Racket, Racket, Racket, and Racket.
- **antiNEWS**: its made of antimatter.
- **sNEWS**: news about inner products, simplicities, special relativity, newts and funny vector spaces.
- **laurierNEWS**: wait, this exists already.
- **dergNEWS**: a 20-page spread of cute dragons :3
- **uppertriangularizablematrixNEWS**: The bottom triangle of every page is left empty.
- **babaNEWS**: NEWS is WIN; BABA is YOU; KIKI is FLOAT and NOT YOU and NOT WIN and PLAY C#
- **jsNEWS**: 69 pages of Javascript typecasting puzzles.
- **dashNEWS**: news about grams of spice, geometry dash, Dasher the Reindeer, dashing fashion, and -.
- **2o66NEWS**: 50 pages of begging for MC 2065/66 to be reopened ASAP so that the people of Post-Exam Gathering can use the space once more.
- **iNEWS**: this news is placed perpendicular to all copies of **mathNEWS** on the stands.
- **ijkNEWS**: this news is released for the 4D lizard-people who control our lives
- **coolmathgamesNEWS**: indoctrinate the youth into the **mathNEWS** ecosystem ASAP to maximize market share with this news.
- **nNEWS**: news that is just “n things” articles.
- **sennaarNEWS**: news about God, Duty, Beauty, Transformation, and Exile.
- **hNEWS**: h.
- **dpNEWS**: news about Design Patterns, Dana Porter, Dynamic Programming, Dragon Pickaxes, Dead Pigeons, Depth Perception and Derivatives on  $p$ .
- **foxNEWS**: we can do what they do, but better. Surely. All we need to include is one (1) boykissing femboy fox.
- **whyNEWS**: a 90 page justification as to why the previous bullet point was conceived of and written.
- **osrsNEWS**: news about the hit MMORPG Old School Runescape.
- **cNEWS**: news about C, C#, C++, Objective C, Seas, Vision, and Holy C, and also C--.
- **logicNEWS**: news written entirely in the cipher described by yours truly in 153.6
- **catNEWS**: cat. We expect our biggest customers to be cat owners who will give this news to their cats to shred for fun.
- **asbeNEWS**: news about asbestos! Yummy.
- **d-eNEWS**: news about the Diamond-E-preferences, resources, organization, strategy and environment.
- **negNEWS**: negative numbers only.
- **NEWSNEWS**: a summary news about all the previous news.

andoiii

## USELESS CLASSICAL MUSIC TRIVIA

- Bach and Handel were blinded by the same ocular surgeon, John Taylor, who blinded hundreds of people
- Beethoven counted exactly 60 coffee beans every morning
- Mozart wrote the overture to his opera Don Giovanni on the *morning* of the premiere day while suffering from a *massive* hangover
- Rachmaninoff decided to be pals with Stravinsky (who casually mentioned liking honey) and showed up at his house with an enormous jar of honey in the middle of the night without notice
- Mozart had a pet bird who he taught to sing his Piano Concerto in G Major
- Mozart hated this one opera singer and knew that she had a habit of raising/lowering her head when singing high/low notes, so he wrote a bunch of jumps into an aria to make her head “bob like a chicken” on stage
- Mozart, at 14, illegally transcribed some church choral music by listening to it just twice. It had 8 voices (parts)
- Haydn’s skull was dug up by grave diggers and separated from his body for like over a hundred years (during that time the grave diggers gave the prince a fake skull, so now Haydn is buried with two skulls :D)
- Mozart was obsessed with dirty jokes; listen to his “Lech mich im arsch” and read the lyrics

vogelstar

# N CHRISTMAS EUROBEAT SONGS TO CELEBRATE A HOLIDAY THAT YOUR CULTURE DOESN'T REALLY DO BUT WHAT ARE YOU GONNA DO WHEN ALL YOUR FRIENDS HAVE GONE HOME FOR THE WINTER BREAK ANYWAY

- *Wonderful Christmas Time* by Niki Niki: cover of famous Paul McCartney song that (bonus!) sounds significantly less creepy.
- *Let's Have A Merry Xmas* by A-Beat-C: has an absolutely hilarious bit at the start where a bunch of children (all speaking in obvious falsetto) are talking to a Santa Claus (who prefixes each sentence with "ho ho ho, why of course").
- *All I Want For Christmas Is You* by Dave Rodgers: cover of the famous Mariah Carey song, slaps much harder than the original, fight me.
- *Silent Night* by Norma Sheffield: apparently a cover of a Christmas carol! Who knew? Not me, I've never sung a Christmas carol.
- *Last Christmas* by Betty Blue: a cover of the Wham! song, quite frankly much less emotional and you probably will like it less than the original, but I prefer it.
- *Christmas* by Ace: I think this is an original song? You can tell because the grammar is all messed up. Regardless, wonderful feel-good music.
- *Holy Night* by Dave & Domino: I don't even care about the rest of this song, I just love it for the lyric, "Do you know why we can celebrate this holy night? A baby born two thousand years ago, called Jesus Christ." (*chef's kiss*)
- *Peace and Love For Christmas* by Marko Polo: Another banger, that you can tell is an original because they run out of inspiration for lyrics extremely quickly, and half of the chorus is, "Come on everybody!"

Also, shoutout to *Initial D: Third Stage*, which is technically not a song, but the best Eurobeat Christmas movie ever.

tendstofortytwo

## PEOPLE CAN'T DRIVE

### A FEW OF MY ROAD RAGE TALES

I have been driving for a few years and I have developed intense road rage. I'm not a crazy person, I don't roll down my window and yell at people, but like... *WHY CAN NOBODY DRIVE?????*

I was driving home from Waterloo, and let's say I was HYPOTHETICALLY going like 140 on the highway (because speeding is illegal so I of course don't do it), and I was being TAILGATED. First of all, did they WANT to get impounded? Because the only reason to tailgate someone is to make them go faster (which, stupid idea anyway because I usually slow down when people tailgate me to be an ass), but going 150???? THAT'S WHEN YOU GET IMPOUNDED! Also, that's just so insanely dangerous?? There was some abrupt traffic happening, so if I had to slam on the breaks, they would hit me and kill me. Which, like—how am I supposed to do math if I'm dead?

That wasn't even the start of my road rage, though. In high school, I'd drive myself and my friend to school every day. And people were *AWFUL*. I have an album in my photo library that consists of bad parking jobs, and the most featured car belongs to one of the teachers there. I would walk into my homeroom every morning bitching to my teacher about how nobody can drive or park.

For example, to get into and out of the parking lot at my old school, there was a small driveway that could only fit one lane for cars going in, and one lane for cars going out. I was near

the end of the line to leave one day, with only one car behind me, and a truck drove the wrong way down the driveway and tried to cut in front of me. Immediately I thought, *absolutely not, dickhead*, and didn't let him in. There was a line of cars trying to get into the parking lot, honking at him to move, and he just had to sit in it. It was awesome. The person behind me didn't let him in either, because again, *DICKHEAD*, so he ended up at the back of the line anyways.

Another time, again after school, I was having a breakdown in my car before driving home—y'know, as you do. I was parked next to some other student, and they were trying to back out of their spot, but they just never... turned the wheel? They backed out straight as far as they could go, almost hitting the car behind them, and were surprised they couldn't leave. They were trying to adjust, and it was going so absolutely horribly I knew they were going to hit me. I could feel it in my bones. Eventually it got to the point where they pulled back in to try again and I turned my car on and left as fast as possible.

So yeah, people can't drive and it makes me mad. I have a notes app list of license plates of people who have wronged me while driving.

cats>geese



# PURPLE GUY

wherever i go, he follows  
 in the moments i least expect it, i see him  
 inescapable,  
 he haunts me  
 but i am the one who is the ghost  
 a shade of my former self  
 i can still hear him  
 the wordless voice taunting me,  
 the melody, a warning  
 the question hanging in the air—  
 my answer doesn't matter  
 he always asks anyways  
 can you do it, he smirks  
 can you blow the whistle

ivyqueen

# HAIKU

one two three four five  
 six seven eight nine ten twelve  
 eleven thirteen

wacfeld

# THERMO SUDOKU (SOLUTION)

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

snowdozer

# MUSINGS AND REFLECTIONS OF A 1A STUDENT

## FRESHLY MINTED WATERLOO WARRIOR RAMBLINGS

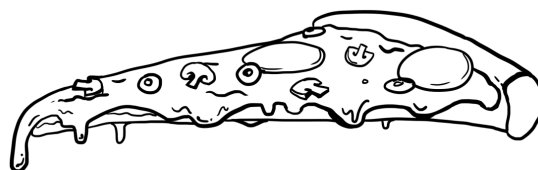
That went by so quick, what the fuck? How is my first final in less than two weeks (even less when you read this)? It's not even that many more of these terms until I'm done. That's insane. Anyway, here are the promised ponderings.

The complaining I've heard online about UWaterloo's social life being nonexistent isn't true, in my opinion, though I haven't been to another university to compare. But I've joined three clubs, made a lot of friends in my program, found a partner, went out to eat, went to the mall, and so on. My social life has thrived compared to before university, maybe because a lot of people here are like me. Meeting people who care about math has been cool, and I love the culture surrounding math here. I love MC, and I love the cute and nerdy stuff MathSoc puts on.

I agree with those who say university is what you make of it. University is also harder than anything I've done before; I'm taking the advanced courses, and the math is so cool and I love what I'm learning but I've never felt so stupid—so consistently stupid—before in my life. Grappling with actually struggling a lot and having to figure out how to manage time and study properly has been a massive, very stressful, hurdle. However, I don't regret taking them, because of the aforementioned cool math :). Rings, groups, and finite fields have been so interesting and amazing. I know some deranged high-schoolers read these, so I recommend trying the advanced courses, but don't worry about dropping down to the honours section. If it's for you, fantastic, but it's fine if not. I think it's worth trying.

I miss having hobbies. I flew out my PC with me because I thought, being here for eight months, that being able to play games would be good. I haven't opened a game since August. I brought all my D&D, Warhammer, and Magic: The Gathering stuff, with similar issues surrounding time management. I hope I can get my shit together in 1B and have time to enjoy hobbies again. Overall, my term has been incredibly stressful, I've lost a frightening amount of weight, and I rarely sleep more than 4 hours, if at all. But I have decided that I love this school and that it is a good fit. :)

sunrise parabellum



## SO LONG, MC 206X

It finally happened :( MC 2065 and 2066 are finally closed for construction, reportedly until the summer of 2024. I, for one, am devastated by this news. For many terms, MC 206X served as prime study spots for any and all mathies, with its constant supply of chalk to go along with high quality blackboards; its proximity to any rooms a mathie would like to visit, particularly the CnD; and its perennial availability, always being unbooked as it was nominally under construction but never so in actuality. MC 206X was one of the only constants in a mathie's life. While schedules may change for the worse, while assignments and midterms may overwhelm, while students and professors alike may inexorably grow older, there was always MC 206X. Always there to provide a calm, quiet, welcoming space for the anxious mathie. And now it has been taken away from us. How could we possibly survive without it? Even now, my mental health has been spiraling downward without the comforting stability of MC 206X. I have tried to find a replacement in PMC, the math CnD, EIT 1015, and others, but no room could ever replace MC 206X.

Out of respect to our fallen lecture halls turned study spaces, I invite the reader to participate in a moment of silence.

[Please pause your reading of this issue for approximately  $\frac{1}{2065.5}$  days, or roughly 41.83 seconds.]

hyperlynx

## I LOVE mathNEWS<sup>PIZZA</sup>

I love **mathNEWS<sup>PIZZA</sup>**. It's so much better than normal pizza. As a **mathNEWS<sup>WRITER</sup>**, it's so great that my hard, laborious labour is rewarded. On **prodNIGHT<sup>DAY</sup>** I wake up and it's all I can think of. The **democraticVOTING<sup>PROCESS</sup>** is always so satisfying. I love how the **mathNEWS<sup>WRITERSHIP</sup>** always tries to get on the bad side of the editors. Totally not something I would ever do. That would be a **certifiedBAD<sup>IDEA</sup>**.

normal **mathNEWS<sup>WRITER</sup>**

Did you know that a **blackBOX** can include footnotes<sup>1</sup>? Technology is so crazy.

A CURIOUS EDITOR WITH  
SPACE TO FILL

1. I made this style myself!

## HOW TO BE IRRESISTIBLE

### DIARIES OF THE HOT AND GIFTED

#### LIST OF CONVERSATION STARTERS

1. omg did u fart...

#### FIRST DATE IDEAS

1. I fill my mouth with water. You fill your mouth with water. We run around and spit on the ground to draw pictures with the water. I spit on you. You gasp. You spit on me. We're wet. We kiss. We fall in love.
2. You paint your feet red. I paint mine blue. And then everyone can wonder why our tongues are purple.

#### SECOND DATE IDEA

1. A wedding.

five min crafts

## SOUPS I WOULD LIKE MY FRIENDS TO COOK FOR ME AFTER BREAKING MY FINGERS

Two weeks ago, I asked my friends to make me a playlist of songs they would play while breaking my fingers. The playlist has been made, but I didn't end up writing about it for my **mathNEWS** article. This issue, however, I will be making requests of my friends. Here is a list of selected **mathNEWS** writers and what soup I expect them to feed me after hypothetically breaking my fingers at my request for a Tumblr post:

- aaqsr: hot and sour soup
- moon: Sardinian herb soup
- OptimisticPeach: potato leek soup
- yalevoynian: French onion soup
- nazz: beef noodle soup
- hyperlynx: cream of mushroom
- amirdadp: Italian wedding soup
- 0.423: (this is his idea) "tomato soup (but not the regular kind. my mom's recipe. unbeatable)"
- Panda!Panda!Panda!: egg drop soup
- molasses: kogel mogel
- thirddoffive: borsch
- Fried Rice: miso soup
- sunrise parabellum: lasagne soup
- Shahabee: gumbo

RapidEyeMovement

## FAVOURITE FLAVOURS OF BUBBLE TEA

Here are the opinions of the best bubble teas from our mathNEWS writers:

- mango with lychee jelly
- mango green tea no toppings
- grapefruit with mango popping bubbles
- taro slush
- taro (2)
- oolong
- peach
- 3 guys milk tea from Coco
- brown sugar foam milk tea
- brown sugar milk tea (4)
- chocolate
- milk tea (2)
- paper tea
- water
- coffee
- milk tea with custard
- lychee (2)
- milk, lychee, 25% sugar and 25% ice (2)
- mango green tea
- peach/mango
- I don't like bubble tea (from an editor)
- I don't know man... milk tea? (from an editor)

mathgeek

## A POEM TO ALEX STRINGER

*LOOKING BACK TO THE TRAGEDY OF WINTER 2023  
STAT 231*

In our first midterm, we were asked on a blank page:

*For your scrap work, or an ironic essay on your love of trees*

So, ironic essay on trees it was!

I love trees  
full of bees  
To be, or to not to tree  
While their stingers fill me with pain  
Alex Stringer's to blame

And months later, just as I had prophesied, I had sat the worst final of my university career.

Pizzadonym

## THROUGHOUT THE REAL AND COMPLEX PLANE

I alone am the honored Riemann Sphere.

CommonDiyar

## N THINGS THAT HAVE HAPPENED WHILE I WENT GROCERY SHOPPING AT THE KITCHENER FARMER'S MARKET THIS TERM

- I bought way too many Thai chilis and ended giving like 75% of them to my friends
- I found a really cool purple cauliflower that leached anthocyanins into the cooking water and made it look like some demonic witch's cauldron
- Someone very aggressively marketed their selection of exotic mushrooms to me (and succeeded, because I bought some)
- I bought eggs from a vendor called the "OK Egg Farm" and the eggs were, in fact, just OK, which was a bit of a letdown because farmer's markets are supposed to have actually good eggs
- I got like 10 potatoes for \$2 once which seems like a suspiciously good deal even by KM standards
- I asked for a student discount of 10% and waited at least 3 minutes for the cashier to determine what 10% off of \$4.70 is
- At the same time as the above, I ended up talking to a man who asked where I studied and he asked if I knew Ross Willard because he goes to the same church as Ross's wife
- Someone asked me if I knew the location of a certain African grocery store in Kitchener was despite me not being African or living in Kitchener
- An elderly woman at the ION station asked me to call her a taxi so she could get back to her retirement home, so I offered to walk over to UWP to connect to Eduroam so I could look up the number of a taxi service, at which point she said "Don't fuck with me, I'll kill you, I'm old school," and then after about ten minutes I ended up walking back to the station because the people at the taxi service wanted to know the woman's name, and then when I got back she wasn't there (all of this took place at around 7:20 AM)

yalevoylian



# HOLY GUACAMOLE THE LAST gridWORD OF THE TERM

## gridCOMMENT 153.6

hello everyone, and welcome to the last **gridWORD** of the term



there was still so many people submitting solutions!! that is fantastic to see, and hopefully i will see you all again next term :0

last time i asked you, "what is your favourite game?", to which you said:

- jerry wang: **gridWORD**
- Sexy\_Software\_Babe: *Avoiding Eye Contact on Public Transportation*
- Partly Cloudy: *minecraft*.
- FRED: *(they gave no response so i will assume it is gridWORD)*
- MJ: *You know ;)*
- LaundroMat: *Humans vs. Zombies wow sure hope that comes back soon*
- snowdozer: *Outer Wilds*

- Lars Nootbaar and Aphf: *The Chicken Game (don't look at the chicken)*
- Urglgrgle: *rip world flipper*
- tridentclaw: *Risk*

the final **gridWORD** gamer who receives the coveted prize will be none other than **Urglgrgle**, so please come to MC 3030 to pick up your prize :)

given that this is the last **gridWORD** of the term, as is tradition, it will be an old one from **mathNEWS** 98.1 (may 13, 2004). there won't be any question or anything this time, just enjoy the **gridWORD**!! my time as **gridMASTER** comes to an end next term, so i will be sure to make some great ones when january starts :))))

i wish everyone a happy holidays and best of luck for your exams!!! i hope to see you all again next term o7

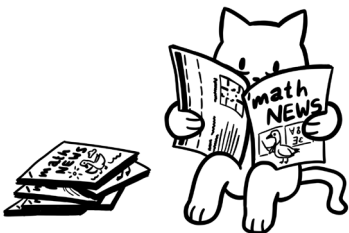
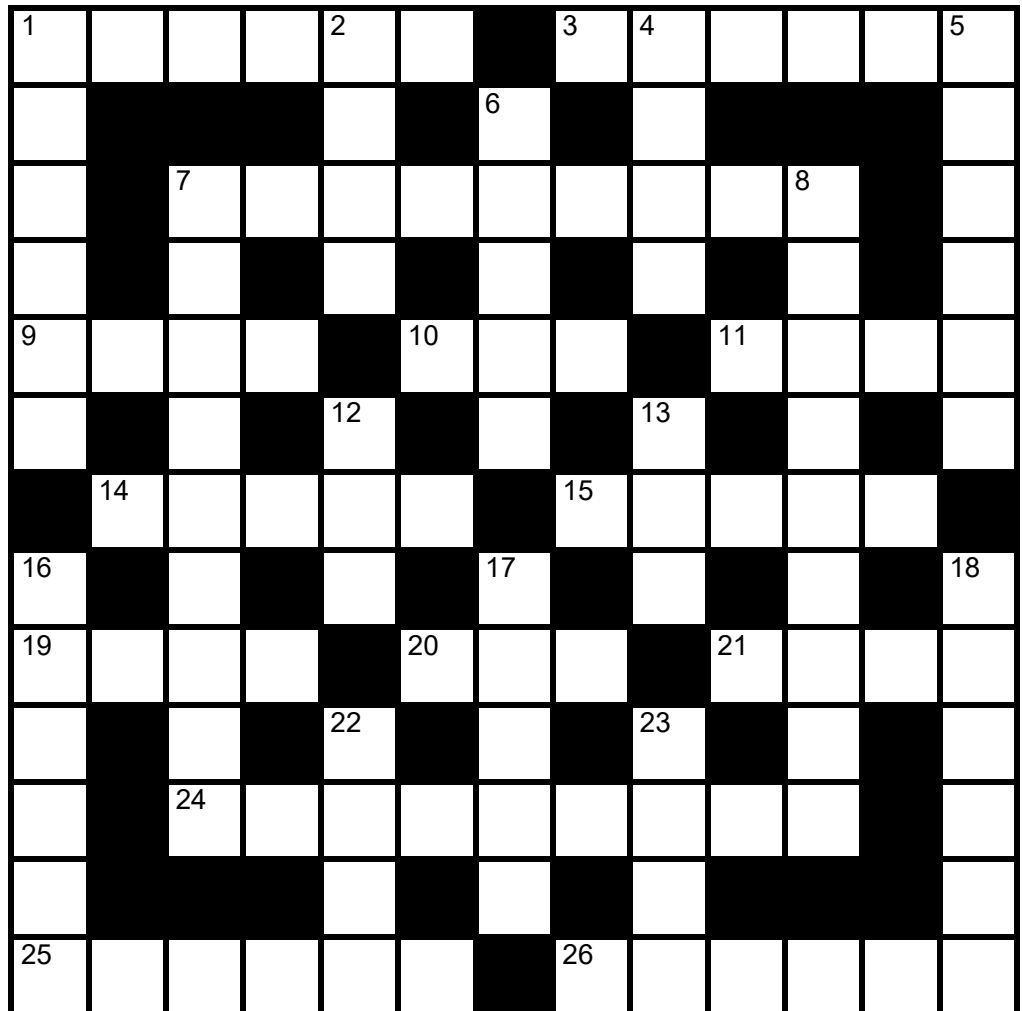
Wink wonk

### ACROSS

1. lesser known IM
3. nunnery mother
7. mythical
9. large body of water
10. gave food
11. off white
14. mollusks
15. speed
19. birthed for characteristics
20. arid
21. Sunday ender
24. army general, sometimes
25. death
26. type of plane

### DOWN

1. move abruptly
2. therefore
4. boast
5. bone at the base of the spine
6. finished
7. most probably
8. sailors
12. physics unit
13. insane
16. degraded
17. common target?
18. cry or whine
22. holes in one
23. auction offers



# lookAHEAD

SUN DEC 3

MON DEC 4

TUE DEC 5

WED DEC 6

THU DEC 7

FRI DEC 8

SAT DEC 9

Classes end  
Repeal Day (Prohibition ends in the United States)

Drop with WF ends

Final examinations begin

evaluatED's PMATH 453 final (he is going to die)

SUN DEC 10

MON DEC 11

TUE DEC 12

WED DEC 13

THU DEC 14

FRI DEC 15

SAT DEC 16

No production night; mourning period begins

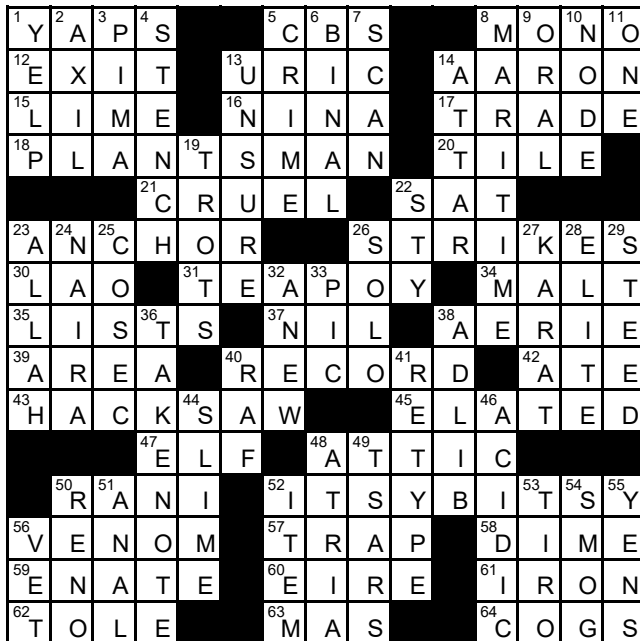
National Ding-a-Ling Day

Wednesday the 13<sup>th</sup>

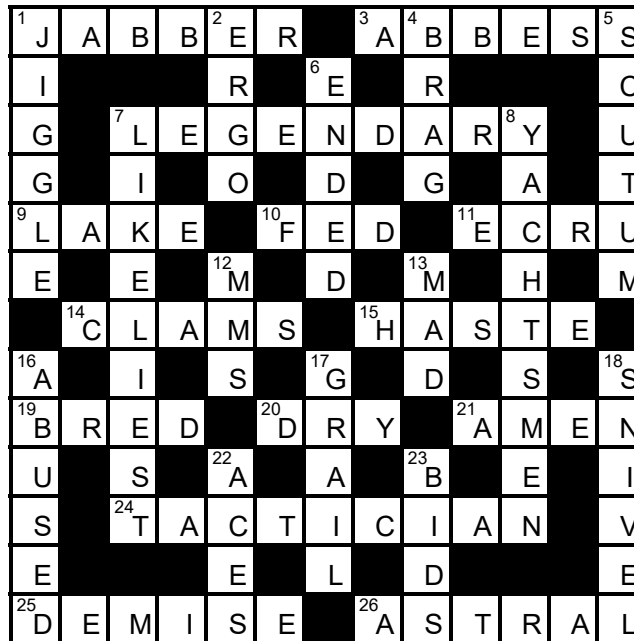
Winter 2024 tuition and fees due

classified's STAT 230 final

## LAST ISSUE'S gridSOLUTION



## THIS ISSUE'S gridSOLUTION



## SAD IT'S OVER? SUBSCRIBE TODAY!

YOUR NAME

MAILING ADDRESS

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