

snowdozer



“WHAT’S YOUR BILLION-DOLLAR STARTUP IDEA?”

I think you can tell a lot about someone by the way they walk around the geese.

Particularly during the last few weeks, since all the goslings have been showing up on campus, I’ve been more hyper-aware of where all the geese are and how they’re acting, and *especially* where all the little yellow runts are.

I have this fear that one day I’ll get too close to a gosling —maybe I don’t watch my step and I accidentally punt one down Ring Road like a football—and then I’ll be ripped to shreds by a vengeful parent. I don’t know why I’m worried about this. It’s never actually happened to me, and if it came to it, I’m pretty sure I could beat a goose in a fight to the death.

I think I might have started to let the sheer ego of the geese get to me. After four-ish years here of watching traffic stop as a goose stands in the middle of the road, or seeing other victims—my peers—get hissed at or chased around campus, I’ve internalized the fear. I won’t ever be able to look at a goose and not see a sinister being actively plotting my doom.

All of this is to say, I’m really impressed by the people who walk by the geese with total confidence, no fear, head held high. I see you—from the other side of the sidewalk—and I want you to know that I admire your strength of will and the valor of your hearts.

You know what’s never going to violently rip you to shreds? **mathNEWS!** We have another banger coming hot off the presses, onto the shelves, and directly into your hearts. We’ve reviews of Uncrustables, more rants about Southern Ontario transit options, and an entire page on Millennium Force. What’s Millenium Force, you ask? Well, you’ll just have to open the issue and find out.

By the way, if you’re as worried about the geese as I am, I’d recommend carrying this issue around at all times. If the worst comes to pass, give them a copy of **mathNEWS** to read. Geese can’t resist the unique blend of witty humour and insightful commentary contained within these hallowed pages—and then you’re free to flee for your life.

Stay safe out there, everyone!

befuddled
Editor, **mathNEWS**

SEXY_SOFTWARE_BABE	it’s a secret (even from me!)
YALEVOYLIAN	A firm that kidnaps billionaires
USMAN!	something something AI
ERALOGOS	AI Metaverse Blockchain Deep Learning Mixed Reality Skibidi
ANDOIHI	We will force other AI startups’ bots to participate in gladiatorial blood sport and sell tickets to watch
ROBBOTC	Start with a trillion dollars and spend 999 billion dollars.
↑←↑→↓→	Giving me two billion dollars
YAMNUSKA	AI integrated hammer
NO PUN INDENTED	Reimagining banking to accelerate your success
GAYA	steal
LARS NOOTBAAR	Buy 500 million in government bonds with a 200% return rate over a period of 60 years. Then wait.
PEACELOVEMATH AND NOT A N*RD	Putting a café in the T&T plaza
AMIRDADP	Solve P vs NP, get a million dollars, invest it in S&P 500 and wait 70 years.
DOLLAR STORE PERSON	geese repellent (or geese pheromones?)
APHF	larsony (larceny and arson) and other miscellaneous crimes
SNOWDOZER	mathNEWS-chan vtuber
MOLASSES.SF	ai.ai — take the headache out of AI by shipping your AI-ready platforms using our AI platform in mere minutes. sign up free.
DICK SMITHERS	Pant Jackets: Jackets that go on your pants
CLASSIFIED	service where you can hire someone to make sure you finish your assignment on time, even if it means locking you inside the library.
AWED	InDesign but it doesn’t crash. & stop telling me about canva or whatever
ABSTRACTED	Socks that come pre-river-watered
DISGRACED	CodeyCoin Casino. There’s only Blackjack.

ARTICLE OF THE ISSUE

Congratulations to RobbotC for Dude, Where Is My Highway. 407 Transitway?, our AOTI for this issue. Take your preferred method of transit to MC 3030 to pick up your prize.

befuddled
Editor, **mathNEWS**

Would Jerma sit on any MathSoc committees?

SARA NAYAR, **mathNEWS** EDITOR FOR SPRING 2025
ALONG WITH GRACE FENG, OWEN GALLAGHER, AWAB QURESHI, AND ISABELA SOUZA

mathASKS 158.2

FEATURING mathNEWS EDITOR DISGRACED

MOLASSES: IF SOMEONE WANTED TO GET INVOLVED IN MATHSOC, HOW WOULD YOU RECOMMEND THEY START?

There's no wrong way to get involved in MathSoc! Student organizations are always hungry for more volunteers, so you can start by applying to roles that align with your interests. Do you enjoy planning events? Consider being an event coordinator. Is graphic design your passion? Look for marketing and content creation roles. Do you want to advocate for your fellow students? Consider being a program representative on MathSoc Council.

You can also start by simply showing up to MathSoc spaces or to MathSoc-affiliated events, no application required. Events like board game nights (and dare I say **mathNEWS** prod nights) provide a welcoming social environment, and sometimes meeting a few new people is all it takes to get more involved.

There's no shortage of friendly faces in MathSoc so either way, you'll end up making a couple of new friends and being surrounded by some incredible people.

The advice here also applies to Math clubs (like the CS Club), organizations affiliated with MathSoc (like **mathNEWS**), and organizations in the larger Math student community (like Math Orientation or Math Ambassadors).

REVIVED: IF YOU HAD COMPLETE DICTATORIAL CONTROL OVER MATHSOC, WHAT WOULD YOU CHANGE FIRST? WRONG ANSWERS ONLY

MathSoc would get lots of lovely furniture that would very much not be stolen from EngSoc.

YALEVOYLIAN: CAN YOU TELL MATHSOC TO GET ANOTHER SCRABBLE SET?

no, i eated all the scrabble sets ☹️

I've passed on your request to the MathSoc VP Operations, who's in charge of all things related to the MathSoc Office. It's been heard loud and clear! If anyone else has concerns, questions, or requests for the MathSoc Office, get in touch with the VPO at vpo@mathsoc.uwaterloo.ca.

AAQSR: FAVOURITE BATHROOM ON CAMPUS?

Before the loss of our dearly beloved bridge, it was the M3 washrooms. Last term I had many a group study session in E6 and E7, so now I'd have to say it's the washrooms there.

MOLASSES: FAVOURITE PUN?

In F22, I wrote a one minute speech for MathSoc's volunteer appreciation event that had 23 cat puns. I then followed it up at the S23 MathSoc volunteer appreciation event with another one minute speech, but this time with 24 sushi puns.

MCPENGUIN: HOW DO I GET A GIRLFRIEND?

Step 1: Join MathSoc Cartoons. After some time, become the director of the project.

Step 2: Meet your co-director. As you work with them throughout the term, find you that you have a lot in common with each other. Not only that, but you get along well. Really well. Start yapping to each other a lot. Due to co-op, you meet your co-director exactly once that term.

Step 3: The following term, you're both co-directors of MathSoc Cartoons again, except this time, you're both in Waterloo. Start hanging out together a lot. A whole lot. Watch shows together, work on MathSoc Cartoons together, grab food together, you name it. You two just *vibe* together, there's no other way to explain it.

Step 4: As a result, all of your friends and all of your co-director's friends think you two should get together. You've both caught feelings for each other, but you're not sure if the other person likes you back that way.

Step 5: Ask them out. They say yes.

Happy third anniversary <3

MOLASSES: WHAT MAKES A ROLLERCOASTER A GOOD PERSONIFIABLE CHARACTER? WHAT'S THE LEAST PERSONIFIABLE CANADA'S WONDERLAND RIDE?

Have you ever looked at a rollercoaster and thought, "wow, rollercoaster names and superhero names sound really similar," and as a result decided to write a novel featuring a bunch of superheroes inspired by the names, theming, and history of rollercoasters?

No? Just me?

I've found that the easiest rides to personify are the ones with a lot of source material to draw from, whether that's extensive theming or a rich history. They give me clear constraints to work within and that I can build from. The ride name also helps—some ride names immediately lend themselves to associated superpowers, while others take a bit of time for a power to come to mind. The flat rides—the non-coasters—as a whole are generally harder to personify because there's less to work with.

I would have to say the least personifiable rides are the ones with names that don't sound like typical superhero names, like Drop Tower or Taxi Jam. I'm not personifying them at all actually—they've been turned into a banking tower and a rideshare company respectively.

Overall, it's a fun exercise in creativity and character design.

APHF: WHAT COASTERS ARE ON YOUR BUCKET LIST?

My bucket list is far too long to put in this article so here's a selection of N rides from that list:

- Millennium Force, Cedar Point
- Fury 325, Carowinds
- Orion, Kings Island
- Top Thrill 2, Cedar Point
- Xcelerator, Knotts Berry Farm
- Pantherian, Kings Dominion
- El Toro, Six Flags Great Adventure
- Lightning Rod, Dollywood

MCPENGUIN: WHAT'S MILLENIUM FORCE? IS THAT FROM STAR WARS OR SOMETHING?

See my **editorTHOUGHTS** :)

SHWARMA: WHY ARE YOUR PUNS SO PUNNY?

They just happun to be like that :)

JOCH: HOW ON EARTH DO PEOPLE SURVIVE MATH? I WAS IN MATH FOR 2 YEARS AND COULD NOTTTTT HACK IT (I'M IN COMMUNICATIONS NOW AND HAPPY)

"Math gets hard, but you get harder."
—Oliver Pechenik, MATH 249

CLASSIFIED: WHAT KEEPS YOU UP AT NIGHT?

Having caffeine way too late in the day :(

0.423: WHAT KEEPS YOU DOWN AT NIGHT?

Gravity.

NO PUN INDENTED: WHAT'S THE SECOND-MOST SECRET THING YOU LEARNED ABOUT HOW OUR UNIVERSITY IS RUN DURING YOUR EXTENSIVE STUDENT LEADERSHIP CAREER?

MathSoc is actually run by MathSoc-chan.

All the clubs and societies are run this way—**mathNEWS** by **mathNEWS**-chan, PMC by PMC-chan, and CSC by Codey. Student leadership is but a myth.

We are mere pawns in their game, made to do their bidding and pursue the academic mission by forces unknown.

I'd better watch my back now that I've let this information out into the world. One of these days, MathSoc is going to take me into the backrooms of MC to be erased from exis—

[Editor's note: the rest of this article could not be found.]

APPLICATIONS OF MIT COCREATE

Before we answer the above question, we must first answer the following: What is MIT CoCreate?

MIT CoCreate (accessible via cocreate.csail.mit.edu) is a collaboration and diagramming tool developed by the Computer Science and AI Lab at MIT. Compared to tools like Canva, CoCreate is far more stripped down, but puts a lot of focus on streamlining its core features as a planner.

Below is a picture of the CoCreate interface.

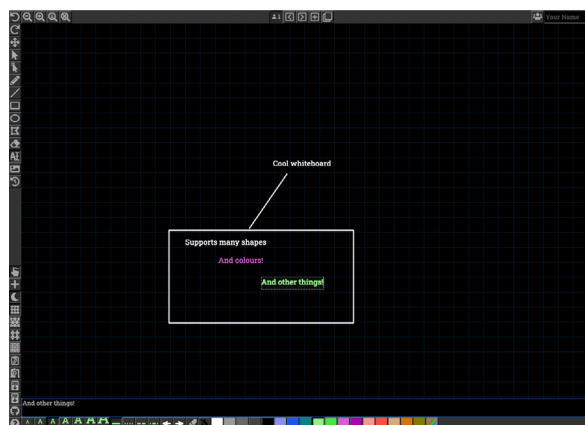


FIG 1: MIT COCREATE INTERFACE

CoCreate offers few options for customization—only a few default colours, font sizes, and styles. However, this simplicity allows one to focus directly on planning and communicating, rather than on aesthetics. Moreover, the comparative lack of features makes CoCreate easy to pick up for new users and minimizes confusion.

This extends well to CoCreate's sharing and collaboration features. For starters, every time you visit the CoCreate website, you're automatically assigned a unique URL for your page. This allows your diagram to persist across multiple visits—a very good way to take advantage of the infinite scrolling! Additionally, this also makes sharing easy, as no account is needed as well, so participants can simply join using the above link.

Lastly, CoCreate also offers many shortcut options for power users, letting you switch drawing tools on the fly. I find myself frequently switching between the rectangle (r), line (l), and text (t) tools when creating mind maps. There's also the hand/scroll (space) and selection (s) tools for manipulating existing shapes.

So, what are the applications for CoCreate? Personally, I would recommend it to help process existential crises about sexuality. If you're ever feeling confused or overwhelmed, I would give CoCreate a shot. Have a good day!

AT THE TURN OF THE MILLENNIUM

editorTHOUGHTS 158.2

The number one roller coaster on my bucket list is the Millennium Force. Located in what's often called the Rollercoaster Capital of the World, it's been named the best steel coaster on ten different occasions by the Oscars of the amusement industry. As the world's first 300-foot roller-coaster, it shattered several records upon its opening in 2000, including those for the world's tallest and fastest rollercoaster. But that's not why I want to ride it.

What if I told you that Millennium Force is a Waterloo student?

At the turn of the millennium, there were signs...

These were the words that blasted across TV screens in 1999, announcing Millennium Force to the world. Blue track soared across a starry backdrop as a robotic female voice promised the greatest thrill ride ever. In tune with the technological optimism of the early 2000s, Cedar Point broadcasted Millennium Force's construction to the world through their blog—a first-of-its-kind for the time. And the world watched its every move. From the day it was announced, Millennium Force was expected to perform, succeed, and then exceed. And perform it did, attracting four-hour lines on its opening day.

Show of hands. How many of you were told from a young age that you had potential? Called gifted, even? How many of you had the pressures of academic performance, extracurricular performance, or both, thrust upon you for as long as you can remember? How many of you were scrutinized by watchful eyes? You need to practice more piano. Your cousin has better test scores. Why can't you be more like this aunty's kid?

And perform, you did. And try, you did. But you were told that you were never good enough. You had to succeed, but how was it attainable, not when there was always someone better, not when you could always do better? You were falling behind from the moment you began.

The nature of designing rollercoasters is such that technology improves and rides become taller, faster, and more innovative. Millennium Force's height record was taken only months after opening. Three years later, Top Thrill Dragster, the world's first 400-foot coaster, opened across the park. Rollercoaster manufacturers learn how to make each element of a ride more engaging. Fury 325 at Carowinds, a 300-foot coaster to rival Millennium Force, took home the title of Best Steel Coaster in 2016, and Millennium Force has never gotten it back since.

Instead of being called the world's greatest coaster, it's now dubbed as overrated. Forceless. No airtime. Painfully average. It stopped getting the accolades it once did. But what changed? Certainly not the ride itself, but those around it.

Once upon a time, performance wasn't tiring. Keeping up was easy. Effortless, even. You felt like you lived up to all the

potential everyone said you had. But how long do you think a student can continue pushing forward with all cylinders firing until they burn out?

Everyone at this school is cracked. You hear about the people who got FAANG for their first coop. You hear about the people with a 95+ average while you're struggling to get a 70. You work with the people who effortlessly balance six courses and club involvement and still have free time. And suddenly, you're not good enough in anything anymore. And suddenly, you have to get better at everything. Those watchful eyes from home aren't here anymore, yet they remain as an echo in your head, telling you that you're no longer living up to your potential. That you're no longer good enough in anything you do. But what changed? Certainly not you, but those around you.

How long do you think a ride can operate at full capacity before it burns out? Before it gets stuck on the lift hill, before its computer begins throwing strange errors that keep the ride inoperational for half a day at a time? Millennium Force isn't pulling the numbers it once was. Its lift motor is broken. Running on empty. Struggling, sputtering.

I'm not good enough. I'm not good enough. It's a mantra echoing in the background, playing even when you're not aware.

Would you say the same about Millennium Force? It still travels at a blisteringly fast ninety-two miles per hour. It still carries an incredible sense of speed, as if it's a comet hurtling through space. It's still among some of the best rollercoasters in the world. Even as bigger and newer and more innovative rides rise around Millennium Force, it doesn't diminish its incredible ride experience.

Perhaps, then, you're not falling behind. Perhaps, then, your worth isn't determined by your achievements or your grades or how much you get done throughout the day. Everyone at Waterloo is cracked, sure, but perhaps that figure of everyone includes you.

Why do I want to ride Millennium Force? I've never been on this rollercoaster, and yet its very being resonates with an aching familiarity, as if I've ridden it a thousand times over. I've never set foot in Cedar Point, and yet I know this ride like an old friend. When I eventually line up for the ride, its trains will race past me in line and I'll listen to the whispers in the wind for the truths it speaks.

It reminds me that I'm good enough just as I am.

You and me both, Millie. We're one and the same.

disgracED

FRIENDSHIP CHALLENGE!!! UPDATE

OR HOW I LEARNED TO STOP WORRYING AND LOVE BOTH SFM PROGRAMS

Almost exactly a year ago, for **mathNEWS** 155.2, I made an article titled *Friendship Challenge*, outlining a challenge in which you try to befriend one student from every program (see below), and my progress towards it. I was supposed to deliver termly updates, but it turns out the number of friends you make is roughly logarithmic to the time you spend here, so that wouldn't have been very useful. But I've made a little more progress since then, so I may as well continue. The exact challenge is:

Befriend¹ someone from every undergraduate program in UW.

No, not faculty, program. On their website, Waterloo boasts to be home to "100+ programs." Indeed, looking at their listing page, the exact number appears to be 102 (their page lists 112, but a lot of those are categories for programs already given). For a 4.75-year co-op program, this means you should be making one of these friends roughly every 15 days to keep up. Also, double/triple majors count (as long as they are actually majors), as well as people who have graduated from a program (at Waterloo).

- AFM: ✓
- Actuarial Science: ✗
- Anthropology: ✗
- Applied Mathematics: ✓
- Architectural Engineering: ✗
- Architecture: ✓
- Biochemistry: ✓
- Biological and Medical Physics: ✗
- Biology: ✓
- Biomedical Engineering: ✗
- Biomedical Sciences: ✗
- Biostatistics: ✗
- Biotech/CPA: ✓ (Somehow)
- CS/BBA: ✓
- Math/BBA: ✓
- Chemical Engineering: ✓
- Chemistry: ✓
- Civil Engineering: ✗
- Classical Studies: ✗ (Technically two programs, but one is good enough)
- Climate and Environmental Change: ✗
- C&O: ✓
- Communication Studies: ✗ (Also two programs)
- Computational Math: ✓
- Computer Engineering: ✓
- Computer Science: My program!!! (No, you do not have to befriend every specialization too)
- CFM: ✓
- Data Science: ✗
- Earth Sciences: ✗
- Economics: ✗
- Education: ✗
- Electrical Engineering: ✓
- English: ✗

- EnvBus: ✗
- Environment, Resources and Sustainability: ✗
- Environmental Engineering: ✗
- Environmental Sciences: ✓
- Fine Arts: ✗
- French: ✗
- Gender and Social Justice: ✗
- Geography and Aviation: ✗
- Geography and Environmental Management: ✗
- Geological Engineering: ✗ (The Dark Souls of this challenge)
- Geomatics: ✓
- German: ✗
- GDBA: ✗
- Health Sciences: ✗
- History: ✓
- Information Technology Management: ✗
- Kinesiology: ✓
- Knowledge Integration: ✗
- Legal Studies: ✗
- Liberal Studies: ✗
- Life Sciences: ✗
- Management Engineering: ✗
- Materials and Nanosciences: ✓
- Math Economics: ✗
- Math Finance: ✗
- Math Optimization: ✗
- MathPhys: ✓
- Math/Business Administration: ✗
- Math/CPA: ✗
- Math/FARM: ✗
- Math/Teaching: ✗
- Mechanical Engineering: ✓
- Mechatronics Engineering: ✓
- Medicinal Chemistry: ✗
- Medieval Studies: ✗
- Music: ✗
- NanoTech Engineering: ✓
- Nursing: ✗
- Optometry: ✗
- Peace and Conflict Studies: ✗
- Pharmacy: ✗
- Philosophy: ✓
- Physics: ✓
- Physics and Astronomy: ✓
- Planning: ✗
- Political Science: ✗
- Psychology: ✓
- Public Health: ✗
- PMath: ✓
- Recreation and Leisure Studies: ✓
- Recreation and Sport Business: ✗
- Religious Studies: ✗
- Science and Aviation: ✗
- SciBus: ✗
- SFM: ✗
- Social Development Studies: ✗

- Social Work: ✗
- Sociology: ✗
- Software Engineering: ✓
- Spanish: ✗
- Statistics: ✓
- Sustainability and Financial Management: ✗
- SYDE: ✗
- Teaching: ✗
- Theatre/Performance: ✗
- Therapeutic Recreation: ✗

It appears I'm at 32, up eight from the last post. Prospects are not looking good for finishing by 2027 but I can always fail a few terms if I need to.

epic_waterman ✓

1. "Befriend" is a nuanced term. For the purposes of this challenge, I mean that the person should know you well enough that you can strike up a conversation with them while walking by and they will actually know who you are. This loose definition I made last year is definitely helping me, since some people I'm including here would probably have less than satisfactory reactions upon seeing me, but would definitely know me at least.

WANT TO MAKE A GAME? JOIN THE UW SPRING 2025 GAME JAM!

Have you ever wanted to make a video game? Join the **University of Waterloo Spring 2025 Game Jam** for 72 hours from **Thursday, June 5th to Sunday, June 8th**! For anyone of any skill level or skill set, this is an excellent chance to grow your talents, connect with peers and industry leaders, and get a completed project to put on your resume.

What's a game jam, you ask? In short, it's like a hackathon for games—a blazing sprint through the entire game dev process. We give you a theme, and you (alone or in a group) will design, develop, refine, and polish a game from start to finish in just 72 hours.

Anyone can participate, no matter your experience level. We've had complete beginners come in and complete a game over the weekend—no expertise required! Our environment is super welcoming, and we have tons of experienced jammers who are more than willing to share their knowledge. Plus, if you ever wanted to get some experience, now is a great time to do it!

We're looking for jammers with a many different types of qualifications—programming, art, writing, music, audio, game design, or any combination of these things are all wanted! Any type of game-related submission is accepted too—from video games, to card games, board games, TTRPGs, concept art, design documents, and more. No programming required!

You can jam remotely, if you'd prefer, but we also have in-person jam sites each day:

- Thursday, June 5—QNC 1502, 5pm–7pm (Event Kickoff, Theme Reveal, Work Session)
- Friday, June 6—QNC 1502, 5pm–7pm (Work Session)
- Saturday, June 7—QNC 2502, 10am–7pm (Work Session)
- Sunday, June 8—QNC 2502, 10am–7pm (Work Session, Closing Ceremonies and Game Demo Fair)

Don't worry if you can't make it physically for some of these times, they're just when the rooms will be open. You're encouraged to work from wherever you are during the 72 hours of the jam. And if you're busy, that's also not a problem—you don't need to work the entire length of the event. Do what you can, from where you can. Even unfinished projects are valuable for your growth as an artist!

Are you just interested in playing cool games? That's alright too! Feel free to come to **QNC 2502 at 5:30pm** for our **Game Demo Fair**, where we'll all be hanging out and ~~doing panicked last-minute bug fixes~~ enjoying each other's new games. We'd love for you to join us!

If this sounds like fun to you, you can register at the form linked in the QR code below (or at the link here if you're reading the online version of this issue: <https://forms.gle/P4PwiqoCTfWgpqVH7>). Also, please join our Discord! It's where we'll be giving out updates and streaming all our events for people who can't make it in person. The link is in the registration form or our Instagram bio (@uwgamedev).



We can't wait to see you!

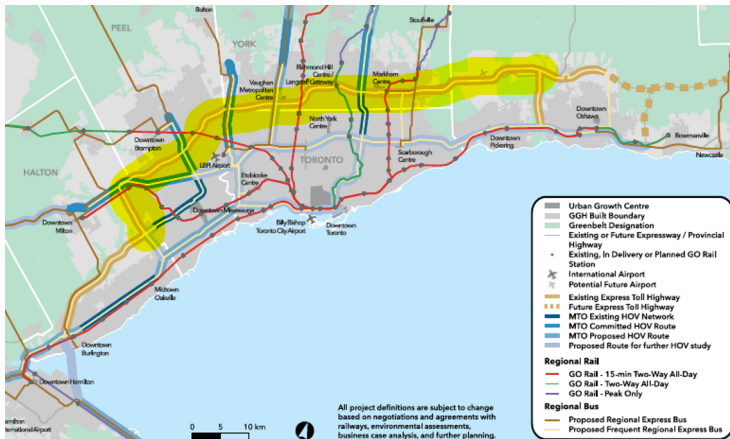
DUDE, WHERE IS MY HIGHWAY 407 TRANSITWAY?

DID WE ALL JUST COLLECTIVELY FORGET?

Between the quagmires of the Eglinton Crosstown, the breakdown of the Scarborough RT, and the madness of the 401 tunnel plans, we in the GTA have too much transit to plan and not enough willingness to implement any plans.

But slipping through the cracks of the illustrious, for better or for worse, some plans from the past appear to be forgotten, perhaps undeservingly so. Let me ask you then, do you know, without googling, what the Highway 407 Transitway entailed?

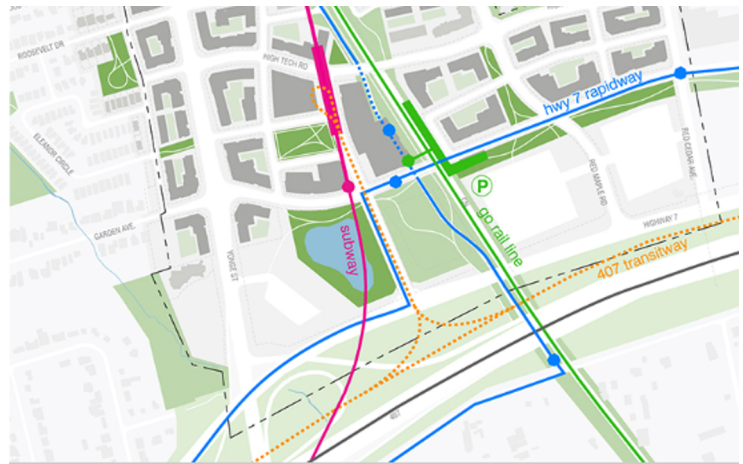
As with most transitways, the Highway 407 Transitway Plan was similar to the Mississauga Transitway and the YRT Viva in that it was a plan that involved a mix of dedicated bus lanes or bus roadways.¹ This plan spanned all the way from Oshawa to Mississauga (in planning, at least). If completed, it would have significantly cut down on GO routes like 40, 47, 52, 54, and 56 that connect people from Mississauga to Brampton to York Region to Durham, and by proxy, Hamilton, KW, Toronto Pearson, etc.



ROUGH COVERAGE OF THE 407 TRANSITWAY, HIGHLIGHTED.²

While the GO Train plans such as the Midtown Line or the York Line might solve this problem once and for all, such plans are still up in the air. Travel time reduction on the 407 buses is the next best thing we could have. (Search “What GO Transit REALLY Needs: The Missing Link (GO 2.0)” on YouTube.)

For our short and medium-term needs, we should expect such a plan to still significantly cut down travel time for GO Buses along the 407 by a non-trivial amount. (We don’t have figures, but I’d say for reference, a 45-minute bus trip between Unionville GO and Bramalea GO could be cut down to 25 minutes (based completely on feeling), assuming dedicated roadway that eliminates on-ramp or off-ramp traffic lights.)



HIGHWAY 407 TRANSITWAY PLANS FOR RICHMOND HILL CENTER DENOTED IN DOTTED LINES, WHERE TRAFFIC LIGHTS ARE COMPLETELY ELIMINATED.³ It could pair nicely too with the GO expansion on service on the KI Line, for instance. (This means you could possibly get from Markham to Waterloo in ~2 hours!)

With all that exposition out of the way, the real question should be asked—where is my Highway 407 Transitway? The idea was proposed as early as 2011, and discussed for opening for 2023.² As with public transit in Ontario however, plans tend to fall through. While it was apparently mentioned in 2017³ and as late as 2021,⁴ no news has reached us ever since, like a ghost floating around the GTA suburbia. However, it is no longer mentioned in the new GO Transit plans (the 2041 Regional Transportation Plan). Even the website, <http://www.407transitway.com> is now up for grabs (Maybe we should crowdfund to buy it! [<https://formurl.com/to/407-buyout>]). Whilst we are getting hints here and there in GO planning, it seems equally likely that the plan is currently dead and no longer pursued. A shame, really.

Personally, I would like to call for a clarification from the Province of Ontario. Whether the project is scrapped completely or implemented in the manner of Eglinton Crosstown, the GO riders deserve better. **Dude, where is my Highway 407 Transitway?**

RobbotC

References and Image Credits:

1. Robert Mackenzie on February 9, 2011 10:52 AM. (n.d.). *Transit Toronto*. Municipalities disagree over Highway 407 transitway plan—Transit Toronto—Weblog. <https://transittoronto.ca/archives/weblog/2011/02/09-municipali.shtml>
2. *About the 2041 regional transportation plan*. Metrolinx. (n.d.). <https://www.metrolinx.com/en/projects-and-programs/regional-transportation-plan>
3. Johnson, A. (2017, March 22). *407 transitway: The Northern GTA's Express Bus Corridor*. Urbantoronto. Urban Toronto.

<https://urbantoronto.ca/news/2017/03/407-transitway-northern-gtas-express-bus-corridor.25802>

4. Six major transit connections on Yonge North Subway Extension. Metrolinx. (2021, July 28). <https://www.metrolinx.com/en/discover/six-major-transit-connections-on-yonge-north-subway-extension>

I DON'T THINK DR. PEPPER HAS ANY COMPETITION AT THE TOP OF THE POP LEADERBOARD

Over \$1B has been spent on advertising for soft drinks in the two (or so) centuries since they were invented. These companies think they're kind of a big deal, especially Coke, whose name is now the second-most known word on Earth, just behind "Okay."

Yet, they all have derived flavours. Coke has hints of caramel and vanilla, Ginger Ale has ginger with a touch of Brisk Iced Tea-like citrus. Pepsi is just fancy Coke, and Root Beer is just fancy Pepsi. But Dr. Pepper is not like other pops.

Its unique flavour doesn't have a name, because it's the only food in the modern Western palette without a single natural ingredient. 100% of its being is optimized for human enjoyment, chemicals perfected over decades to seek out and satiate some deep, hidden void mother nature left in our reptilian sensory processes.

Go drink a Dr. Pepper for breakfast.

no pun indented

SOCRATICA EXISTS

- you should give it a try
- everyone can join
- free breakfast and snacks
- you can have an excuse to wake up early on Sunday morning
- and get things done
- and make friends (they are wholesome!)
- very lavish washrooms
- their co-work space is next to CIF
- so we can play frisbee there together afterwards
- or go to gym beforehand

eralogos

<https://www.socratica.info/>

LIFE HACKS FOR LIVING IN RESIDENCE

- Certain campus residence buildings make air conditioning available to students. You might not know that one of the numbers on the screen actually represents how hot or cold the room is. When the room gets hotter, the number goes up, and when the room gets colder, the number goes down! Unfortunately, nobody knows exactly how much heat each number means.
- Tired of carrying pasta in your hands all the way to your room? Campus housing now offers green "eco-containers" in their eateries for students to pay for and use. However, even though these containers are empty when purchased, it's actually possible to put food inside, and even buy your food with the container still around it!
- Room numbers can be up to five digits long, which is quite a lot to remember. An easy trick to make sure you get the right room is to always put your key in the keyhole and turn it counterclockwise before you leave. When you return to your floor, the correct door will be the one that doesn't open when you turn the door knob!
- Each residence should have a room full of washing machines and dryers, which you can put your clothes inside to wash and dry, respectively. What you might not know is that you can greatly improve their effectiveness by paying two dollars with your WatCard and closing the door! The machine will start to make noises; it's unknown what happens inside but the clothes will come out cleaner.
- While every residence offers a bathroom with a toilet to students, the toilet may become unpleasant or even impossible to use over time. However, there's an easy fix for this problem! Every campus toilet has a small metal handle somewhere on it which, when pulled, replaces the toilet water and removes all leftover waste, allowing you to reuse the toilet as many times as you need!
- Need a way to break fewer bones on your way to class? While the window is the only place where you can directly see the outside world, there's a safer way to exit! Each dorm room also comes with a door which leads to a system of hallways. At some point in the maze there should be a room with elevators that lead to the lobby, where there are doors that lead outside!

Grease Bucket Devourer

mathNEWS

I HATE EPIC GAMES

In May 2019 Epic Games bought Psyonix, the company that made *Rocket League*. This was the worst event since the death of Harambe, which apparently has its anniversary on May 28th, which will be the Wednesday of the week in which this issue comes out. Please take a moment to reflect and pay your respects.

Rocket League was and maybe still is my favourite game, and it was really good before the acquisition. The devs cared about the game and the players and were actually responsive to the game's problems.

Then Epic bought the game and it was not epic. They must have had a meeting where they asked, "What can we do to make this game worse?" and the answer was, "Let's take all the stuff that makes the game good and fun and remove it and add stuff that is stupid and dumb." Most of these changes were motivated by the strategy that pushes forward all large corporations, which is "why have less money when you can have more money."

The first thing they got rid of was crates. We can have a discussion about whether or not it is moral to have children gambling for in-game items, but damn was it fun. I remember being hyped as hell when new crates came out to see the new items, and waiting for someone to open the new black market decals to see what they were, since they were not able to be previewed like the other items. Crates were removed in favour of a Fortnite-style item shop where you just buy the items, and they're way more expensive. The Psyonix DLC was like \$2 to get the Batmobile and the Epic DLC is like \$20 to get the fucking Ford F-150.

You may be wondering what they did with all the crates in people's inventories. These were all potentially a \$1 key away from being an item worth a hundred bucks, so they can't just delete them. Instead, they turned them all into "blueprints," which you could roll like a crate for free, but then had to pay to actually unlock whatever item you got. The price scaled with the rarity too so you'd have to pay 20 bucks to get the item you rolled. Otherwise the blueprint would just sit in your inventory. Blueprints also drop after games but those ones all just have an item already in them, and you still have to pay, but you don't get the fun of rolling them.

Exhibit B is trading. *Rocket League* had a prominent trading scene similar to that of *CS:GO*, although smaller. It was fun to trade from some trash decal to a cool set of wheels, but with the introduction of the item shop, the trading economy was turned on its head. Really expensive items in the trading world would be sold by Epic directly to players for way less than they were worth on the open market, so the people who had those items would basically have the value of their stuff deleted. This was a problem for a while, but was solved when Epic just completely removed trading from the game. Now the only way for you to get an item you want was to buy it from Epic because fuck you. I had a set of \$100 wheels that I didn't really care for but thought I could trade them for something

I did want at some point, but now I can't, so I just have them sitting around, and they are worth nothing since I can't trade them.

The removal of trading was incredibly unpopular, and their excuse of "trying to stop scammers" was a weak attempt to cover up the fact that they just want more money. Simultaneously, they shifted the development outlook of the game from fun new features and gamemodes that kept the game fresh to play, with one million bajillion new items in the shop. There has been next to no new actual content beyond cosmetics since Epic took over. They have made some new maps sure, but they are all rectangles, so it is just some new art on the outside really.

The one good thing Epic did do was make the game free to play. However, I don't think this end justifies the means of all the stuff they did to get there. This also meant they removed the game from Steam and put it on the Epic Games launcher. This made it inconvenient to play with friends who were on Steam and I recall the modding community was upset due to the changes needed to make their stuff work with the Epic Games version.

Basically, there's no new content in the game outside of cosmetics. Epic has chosen to make money with the game not by making it more fun and causing more players to play it, but by adding an infinite amount of things you can buy to put on your car. Fortnite gets new updates all the time with new maps and new guns and now they have an AI chatbot Darth Vader NPC you can talk to. It's like that meme where the parent is playing with one kid in the pool while the other is drowning. I've stopped playing the game because there is nothing new to get excited about. They've also neglected to keep up with bad actors, with people DDOSing lobbies, using cheats to make their cars invisible, and having bots play on their accounts to boost them.

To conclude, fuck you Epic, you ruined something I like. I hope my friend who is working as a co-op for you next term commits lots of time theft.

Yamnuska

COOL LONG MUSIC

IN NON-INCREASING ORDER OF DURATION.

1. *Feedbacker*—Boris (43:51) *noise rock, metal, ambient*
2. *Long Season*—Fishmans (35:16) *dream pop, ambient*
3. *The Glowing Man*—Swans (28:50) *post rock*
4. ○ (*Vision Creation Newsun*)—Boredoms (13:42) *psychedelic rock*
5. *Earthmover*—Have a Nice Life (11:28) *shoegaze, post rock*

KENDRICK LAMAR: WHY I THINK HE'S NEAT

The man who taught us all how to hate effectively, the myth who came out of his peaceful era to end Drake's career, and the absolute legend who performed his scathing diss *Not Like Us* live at the most watched Superbowl halftime show in history: Kendrick Lamar. 38 years old, loving husband, father, and the Boogeyman haunting Drake. But I'm not here to go over the rap beef of last year, nor his incredible musical history. I want to talk about Blackness, Kendrick Lamar, and authenticity, and how Kendrick impacts me.

Growing up in a small town in Southern Ontario in the 2010s, I wasn't connected to my Blackness, and the only connection to my homeland was through my parents' cuisine and mindset. The music I heard my sister listening to was my first brush at what my skin colour meant in a culture that saw me as undesirable. However, 14 years later, the rap beef was the first time I actually cared about Black¹ music and how it impacts society. I mean, yes, I enjoy Eminem, some Chance The Rapper, and old R&B from my parents' era, so it wasn't as if I was going in blind, but this was a piece of pop culture I could engage in without feeling like I was being a caricature of a culture I was supposed to be a part of, but wasn't. For one thing, Kendrick was kicking Drake's ass lyrically, and I was all for it. For another, thanks to the internet, everyone wanted to be the first to analyze each line of each song and break down who was winning. I just enjoyed *Like That* and *Euphoria* for their musical properties, and how vicious the lyrics were. *meet the grahams*, however, allowed me a view into how diverse Black music can be. I'd like to note that this was before I had listened to more than one Tyler The Creator song, so please don't yell at me. I was an emo and rock listener for most of

my life. Anyways, the haunting tunes allowed me to see music as something other than a joy bringer or a money maker or a simple way to express your emotions. It can be used to reveal a soul, and although the image of Drake's was one no one liked to see, it was necessary because it then allowed many to change their perspective on music.

And then *Not Like Us* released a few hours later. And suddenly we had a heater of a summer song. That song makes me feel connected to my Blackness in a liberating way, and so, I sought more music for that feeling. That's how I got into Tyler The Creator as a whole and Kendrick's latest album, *GNX*. I also started to listen to Lauryn Hill, and leaned more into the old black music my parents enjoyed. But why Kendrick? Because his lyricism is some of the best in the industry, bar none. It's intellectualism, Blackness, and rhyming all in one, and those are things that have always been a part of my life in some aspect. Kendrick, Tyler, and all the other artists I've come to like, have allowed me to embrace the colour of my skin and my intelligence. When I finish my degree, I might drop a bar or two.

And of course, I'll be sure to hate with purpose.

Jochemist

1. I'm not counting pop music made by Black creators because the whole genre implies that the music is good because it's popular, and what is Black is always popular in white culture, just not respected. Black music refers to music made by and for black people in this particular use case.

TO ANNIE

I turned the keys as the engine gave out a gentle purr. A couple pushes and clicks tilted the roof up and illuminated the dash green, a pre-flight checklist that I know I'll yearn for in the future. The cigarette lighter sparkled with a fluorescent halo as it rattled in its position. I don't smoke, but I always kept the lighter.

The red light meant nothing. I could turn and head home—as I was meant to do. But as the sunset glistened before me, I couldn't help but stare. On green, I pushed forward, down a twisty road to nowhere. The aftermarket stereo gave off a blue tint as song titles danced across it:

BROCKHAMPTON—CANNON

*"This is everything I ever wanted, though
Dreamin' of a candy store
Brother couldn't tell me no, no, so"*

The gauges ticked upwards as I sped past my best friend's house. She had moved back in with her mom a couple weeks ago, so I guess it was just some place I used to go to, now. It wasn't long after that I had found myself alone, chasing the sunset that fled from me. The cold wind pierced through the cabin from all sides, freezing my grip around the wheel.

I don't know when I decided to turn around. The drive back was slower and quieter. The keys in the ignition jangled with every bump and pothole; rolling the windows back up made way for creaks and rattles in the plastic interior.

I couldn't help but think that this was a sendoff. A memory I'll look back on with regret and nostalgia—that one day I'll yearn for simplicity again.

Your second car is always faster, cleaner, and more expensive—but it won't have the soul of your first.

Usman!

CALL OF THE HOVERCRAFT

I stride along my apartment's aeropark, walking confidently past the specimens that stand limply to one side. A single gust of wind might blow them over the edge, sending them to a painful yet merciful end a hundred feet below. I pay no attention to them, nor the owners that mill around them. My quarry is further ahead. A light breeze ripples across my jacket, whistling past my ears as I don a pair of tear-drop aviators. The sun is out, with barely a cloud in sight—I'll need to maintain my bearings in the sky.

Rounding a corner, my target comes into view. A silver mound, gleaming in the sunlight, rests at the very end of the aeropark. A small crowd has gathered around it, chattering and pointing. I pay no attention to them; their opinions don't matter. I inject a suave hop into my step, looking more carefree than I feel as I draw closer to the crowd. Fingering the authenticator in my pocket, I press my thumb on the scanner. A short beep sounds ahead of me, directly in the middle of the crowd, as my hovercraft unlocks.

The crowd parts for me, empty gazes in their eyes. The whispers gets louder. "You *fly* that?" one bystander exclaims. "Why don't you invite me on board?" a second voice teases. "Where did you *get* that, man?" a third voice exclaims, shock leaking out of his every orifice. I ignore them as I reach the door and pull.

It does not budge. I figured this would happen. The cancerous rust that started at the front recently reached my doors, rendering them stiff and immobile. I tug on the door once more in vain. The crowd groans along with me. I tug again; the crowd cheers me on. I give one final valiant pull as the door groans and screams in reluctance. The audience now cheers and doubles up in hysterics. I have just enough room to skirt the patchy white exterior of my hovercraft, engaging in a humiliating crawl towards the cockpit.

I'm thankful for the aviators, which hide my eyes and cheekbones. My cap rests on my head, shading the rest of my facial features as I flop around head-first in the cockpit. Two wiggles later, I feel a pull somewhere in the region of my ankle. I lie prone for a minute, assessing the damage. My mouth is close enough to the control stick that an external observer might come to more vulgar conclusions about what I'm trying to do.

With a final yank, my legs rocket inside, colliding with the power switches. A shudder courses through the tiny craft as the engines ignite, sending a blast of smoke directly into the crowd. I smirk, even as my position becomes increasingly unenviable. I see a young woman cough and jump from toe to toe, trying to evade the plumes of thick exhaust that my craft is spewing. I'm glad I don't have a passenger. To do so, we would both have to adopt a socially compromising position that would guarantee we go viral.

Righting myself, I do a cursory check of the controls. The autopilot flickers on, but I know it's a lying jerk. It gave notice

nearly a year ago, forcing me to operate the controls manually. Apart from the manufacturer expressly advising against this, the control stick is so worn that I find myself periodically updating my last will and testament. I wiggle it around. They deflect weakly, which should be enough for a short hop to the supermarket.

Closing the door is just as trying a task as opening it. I decide to relent and leave it ajar—also against manufacturer policy, but at least my seatbelt works. A crudely-fashioned crowbar stands in for the power lever, the mechanic's last-ditch attempt to get my third-hand purchase flying once more. A screen fails, followed by a backup, but I'm used to this by now. I program the route in my GPS, careful to select a low-altitude airway, and apply power as the craft shakily ascends into the air. Whether I will touch down rapidly or gently is anyone's guess.

eternal_peace

A FORMAL COMPLAINT TO EVERYONE READING THIS RIGHT NOW AND MORE

May 23, 2025

To whom it may concern,

Before reading this article, how many of you would recognize the significance of May 23rd? From what we have observed, very few, if any at all.

But we all ought to remember, as Math students, professors and possibly administrators at the University of Waterloo Faculty of Mathematics.

If you did not answer the question, let us remind you then. The answer lies on the plaque on 2nd floor, near 2063.

May 23rd is the birthday of MC—Mathematics and Computer Building. It is where MathSoc and **mathNEWS** is. It is where our joys and sadness lies. It is where I am writing this complaint right now. It is home, and home is where the heart is.

As such, it is with great disappointment that we saw no celebrations of the anniversary of our beloved MC. We hope that MathSoc would do better in the years to come as we celebrate the birthday of our dear home.

Yours, with disappointment,

RobbotC & eternal_peace

profQUOTES

AMATH 250: JOE WEST

“ So anyway, we’re going to make a crater today.

CLAS 202: DAN HUTTER

“ Num num num num num num.

“ Light the pigs!

CO 342: MARTIN PEI

“ Weak induction can be eliminated because it is weak, I suppose.

“ Max separator will destroy everything... just like I’ve been doing my whole life.

“ You guys are probably excited for the long weekend. It’s probably a rainy long weekend, but that’s good since we’re not outdoors people.

“ When you mix orange and green, what do you get? Purple, purple.

“ First big proof of the course, you survived it! Or maybe you’re dead. You’re not saying anything.

“ I’m very careful of only having two Ks.

“ Everything in this course is easy. That’s a lie.

“ Let’s prove my favourite proof in this course! It may not be your favourite proof...

“ This is actually a stinky proof, so let’s do this carefully.

CO 446: PETER NELSON

“ Most matroid theorists wouldn’t know this because they haven’t done my assignments.

CS 146: BRAD LUSHMAN

“ This is where it becomes a nightmare. That is the technical term for it. Nightmare.

“ You write me a garbage collector, and then we’ll talk.

CS 449: ANA CRISAN

“ King Charles and Ozzy Osbourne have the same demographics. They were both raised in the UK, married twice, and live in a castle, but they are very different people. I would assume. I don’t know them personally.

ENGL 251: SHELLEY HULAN

“ The [em] dashes are the devils of punctuation.

“ It’s like you’re saying, “I don’t care! I don’t care! I put in the dash!”

“ I’m still in love with the semicolon.

“ Let’s assume the content is normal and we talk about nuns all the time.

MATH 235: ROBERT GARBARY

“ I don’t want to deal with this “division by two” nonsense.

MATH 4408 (UQ): ARTEM PULEMOTOV

“ I vaguely remember seeing somewhere the line “Let μ be a complex-valued measure.” I don’t remember where I saw that, it could have been in a dream.

“ Stieltjes was Dutch, which explains why the spelling is so weird.

“ Now, from our early days when we were all babies and said goo goo gaa gaa, we remember that there’s not a unique type of convergence.

“ *Student:* Is this like the Borel-Cantelli lemma?
Professor: Maybe? I mean, I don’t remember the Borel-Cantelli lemma. But I remember studying the Borel-Cantelli lemma.

“ In modern terms, they tried to cancel [Nikolai Luzin]. Except back then, “cancelling” meant that you were taken to the basement of the KGB and you never got out.

“ And then you fall into a... actually, let’s not do metaphors today.

“ Look, no one has done BJJ here, right? If you can tap me out, I’ll give you \$100. I would promise you a 7 but then I almost certainly would get a call from HR. [*Context: A 7 is the highest achievable grade at UQ.*]

MATH 3302 (UQ): DANIELE CELORIA

“ It’s a right that you have; you should exercise that right. And also it’s a right that entails pizza.

“ In Italy, I failed topology seven times, because there was a professor there who was a bit, sort of, on the more creative side, let’s say. And now I’m a topologist!

“ Now, in three minutes, let’s do all of elliptic curve cryptography.

“ [Five students raise their hands simultaneously] Whoa, in this class we assume the axiom of choice so please well-order yourselves...

MATH 3303 (UQ): MASOUD KAMGARPOUR

“ Water water water! [Context: Masoud Kamgarpour was a Waterloo math student; he graduated in 2003.]

“ The Absolut trials were like the Bernoulli trials, except you took a shot of vodka each time you get a question wrong. You should see if you can restart it again.

MUSIC 140: SIMON WOOD

“ Madagascar. That's where King Julien lives. I love that guy.

“ God help you if you wrinkle a candy wrapper or something. The ninjas come down and kill you.

“ What does this mean? Let me demonstrate poorly.

“ I bet you're sitting there going, “What the fuck is he talking about? I didn't pay for this, I paid for music and jokes!”

“ WE ARE THE KINDERGARTEN CHOIR! WE HAVE ONE LEVEL AND IT'S THIS!

“ Why do people have daughters?

“ [On Kanye] I think he desperately needs someone to say, “We need to go camping.”

PHYS 263: DAVID YEVICK

“ I noticed that no one has taught this course twice, I guess I'm about to find out why.

PHYS 363: KEVIN RESCH

“ The *dt*'s cancel.

PMATH 352: XUEMIAO CHEN

“ Okay, I have 10 minutes and 6 pages [of notes].

**Don't put that in
mathNEWS. I don't need
my name attached to it
when you Google me.**

BLAKE MADILL

MY THOUGHTS ON UNCRUSTABLES®

What a daring, bold name. This sealed sandwich without a crust claims to be ineligible from, and completely absolved from, the crusting process; this circular snack's name implies that, despite any effort made to give it a crust, nothing can make this bread any bit crustier. I say that this cannot be so. Simply because a sandwich lacks a crust, at one point, does not mean that it cannot at a later time have a crust. Any sandwich bread which has an edge, any bread which forms a surface that spans a finite region of space can, undoubtedly, have edges that are darker and crustier than the rest of the bread. The only TRULY uncrustable bread is bread which does not have a boundary which can, conceivably, become crust. A PB&J sandwich enclosing the Peanut Butter & the J between 2 infinitely-long pieces of their Unbeatably Soft Bread™, covering an unbounded expanse of space that has no edge would be a product that Smucker's could legitimately, truthfully, and fully honestly call uncrustable. Do not believe the lies of the J.M. Smucker company. Their supposedly “Uncrustable®” sandwich is absolutely crustable.

abs(Jester)

P.S: If anyone figures out how to make an infinitely-large slice of bread, please let me know

ISSN 0705-0410

UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

mathNEWS is a normally fortnightly publication, funded by and responsible to the undergraduate math students of the University of Waterloo, as represented by the Mathematics Society of the University of Waterloo, hereafter referred to as MathSoc. mathNEWS is editorially independent of MathSoc. Content is the responsibility of the mathNEWS editors; however, any opinions expressed herein are those of the authors and not necessarily those of MathSoc or mathNEWS. Current and back issues of mathNEWS are available electronically via the World Wide Web at <https://mathnews.uwaterloo.ca>. Send your correspondence to: mathNEWS, MC3030, University of Waterloo, 200 University Ave. W., Waterloo, Ontario, Canada, N2L 3G1, or to userid mathnews@gmail.com on the Internet.

mathNEWS is overseen by the Board of Publications, an autonomous board of the Federation of Students, University of Waterloo, hereafter referred to as Feds. mathNEWS is editorially independent of Feds and the Board of Publications. mathNEWS has never been requested to withhold Improper Content as defined under Feds Policy 71.

Except where otherwise noted, this work is licensed under the Creative Commons Attribution-Noncommercial-No Derivative Works 2.5 Canada License. To view a copy of this licence, visit <https://creativecommons.org/licenses/by-nc-nd/2.5/ca/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA. Terms may be renegotiated by contacting the mathNEWS Editorial Team.

MUSIC OF THE SPHERES IS ON SPOTIFY NOW

(AND WHY I THINK THAT'S INTERESTING)

Picture this: it's 2012. You, one of the most legendary video game composers of your generation, are sitting in a recording studio, overseeing an orchestra perform your magnum opus. As the horns swell to a crescendo, you look to your right, and see your co-composer, Paul McCartney.

Your name is Marty O'Donnell, your project is called *Music of the Spheres*, and the video game it was written for is called *Destiny*.

You don't know it, but this is the peak of your career. It's all downhill from here.



When development started on the game which would become *Destiny*, developer Bungie was on top of the world. They had exploded to prominence in the early 2000s with the megahit *Halo* series, and while corporate owner Microsoft was perfectly happy to have Bungie keep making *Halo* games forever, Bungie was more ambitious than that. In a remarkable move, they managed to negotiate their own independence, leaving *Halo* with Microsoft¹ and setting out on an all-new project.

Suddenly, the sky was the limit. They could work with anyone on anything, and they knew it. They got a massive \$500 million contract with Activision for the game which would become *Destiny*, and voice talent from Nathan Fillion to Peter Dinklage were cast as in-game characters.

The biggest name they roped in, however, would be someone else: Paul McCartney.



Marty O'Donnell wrote the music for *Halo*, which automatically made him one of the most beloved game composers in the world.²

It also gave him a lot of leeway in how to approach the music for *Destiny*. He decided to create a 'musical prologue,' which would be released *before* the game and serve as an introduction to the tone, themes, and universe.

And in a move which could only have been pulled off by 2010s Bungie, they managed to get the most famous musician on Earth to work on the project—for *free*—helping compose the orchestral basis for the game's dynamic adaptive music.

Music of the Spheres is an eight-movement symphonic piece, where each movement is themed to a different celestial body in our solar system. It's a synthesis of the concepts of the *Music universalis*, an ancient belief that the planets moved in time to imperceptible music, and an integral piece of *Destiny* lore—an entity known as the Traveler, a mysterious sphere hovering over the Earth which communicated with humanity

using signals interpreted as music (as well as being the thing which gives each player their space magic powers).

By all accounts, *Music of the Spheres* was the best work Marty and his team had done yet. It was a promise of wonder, mystery and adventure. In retrospect, it was a promise that *Destiny* wouldn't be able to keep.



In summer of 2013, Bungie realized that *Destiny*'s story wasn't working. This was a problem, because the release date was in September.

Bungie's culture had always skewed towards perfectionism. In 2003, after two years of work on *Halo 2*, they realized they had overscoped and almost all of it needed to be redone. So they delayed the game a year, crunched like mad, and shipped a masterpiece.

But that was 2003, and this was 2013. As they say, the only thing worse than bad habits leading to failure is bad habits leading you to success.

As the existing story was jettisoned and a new story was Frankensteined together from the existing completed parts, Activision began taking a heavier hand in development, much to the chagrin of one Marty O'Donnell.

He was particularly incensed about a terrible E3 trailer for the game which Activision produced without any of his input—or any of his music. He wanted no association with the trailer, which he loudly and publicly made clear on Twitter. The relationship between Marty and Activision only deteriorated from there.

On April 11th, 2014, Marty O'Donnell was fired from Bungie. Marty says this was without cause. Bungie says this was because he was being insubordinate and neglecting his duties on *Destiny*.

One thing's for sure: suddenly, no one felt like releasing *Music of the Spheres*.



Music of the Spheres represents a moment in the history of Bungie—maybe the last moment—where they felt invincible. It's Icarus at the local maximum, before he realizes his upwards momentum has stopped.

Destiny, when it finally launched in fall 2014, had a lukewarm reception. There were glimmers of greatness, but the story was barely cogent, and clearly stapled together awkwardly from its component parts. The crunch that saved *Halo 2* just didn't work this time.

Destiny never fully recovered from this botched launch. Through expansions and sequels, the story would be fleshed out and the mechanics refined, it never reached the level of cultural dominance that *Halo* achieved.³

Marty never did anything nearly as big as *Halo* ever again.⁴ *Music of the Spheres* remained unreleased for about a decade, apart from fan edits of existing material and an extremely limited vinyl release.⁵

And then, one day in January, with no fanfare, *Music of the Spheres* showed up on Spotify as part of *The Music Of Destiny: Volume 1*.⁶ As far as I can tell, it was by accident.

Bungie has a new corporate overlord now—they were purchased by Sony in 2022 for 4 billion dollars. Sony seems to have been doing a routine re-issue of the *Destiny* soundtracks, including that vinyl I mentioned earlier, and just... didn't realize that *Music of the Spheres* has been a closely guarded secret a decade.

Music of the Spheres represents a team at the peak of their powers, right before it all went wrong. The songs, then, don't just represent an unfulfilled promise for a game series that never quite hit its potential.

It also represents the last moments of a creative team that had produced stellar work, before the force of their own personalities tore them apart. It's almost like *Abbey Road*, to bring it back to the Beatles: it represents the end of a creative era that some argue we still haven't really surpassed.

Also, it's just damn good music.

Dick Smithers

1. The *Halo* games that Microsoft would produce without Bungie garnered, shall we say, a *mixed reception*.
2. Of course, he didn't do it on his own. Marty's partner, Micheal Salvatori, was an instrumental part of the music for *Halo* and *Destiny*. In fact, he stayed at Bungie long after Marty left, working on every *Destiny* expansion until Bungie laid him off in August 2024 for no discernable reason.
3. Before launch, Bungie proclaimed that *Destiny* would not only surpass *Halo*, but equal *Star Wars* and *Lord of the Rings*, which in retrospect probably sealed their fate right there.
4. The drama seems to have made him unemployable—if he even wants to work for anyone anymore. He formed his own company, and released one VR game without much of an impact. He seems to spend most of his time these days arguing with strangers on Twitter about 'wokeness' and, uh, running for Congress.
5. The only real obvious outcome of the Bungie–Paul McCartney partnership was *Hope for the Future*, a tie-in pop song written by Paul that played over *Destiny*'s credits. It's extremely cheesy, but I like it.
6. If you're pulling up the album on Spotify, *Music of the Spheres* consists of everything from 'The Path' to 'The Hope.' My personal favourite is 'The Path' but they're all bangers.

DELTARUNE

LESS THAN A WEEK AWAY...

Can you believe it? Deltarune, less than a week away. Deltarune, June 4th, 11am EDT. Deltarune, Chapters 3–4 only four years after the release of Chapter 2. Deltarune, by indie game developer Toby “Radiation” Fox, best known for his music compositions for Homestuck and Pokemon. Deltarune, episodic bullet hell RPG. Deltarune, sequel/alternate universe/parallel story/prequel/unrelated/follow-up/anagram/something to some niche indie game Undertale, coincidentally also by Toby Fox. Deltarune, a fever dream some guy had fourteen years ago. Deltarune, coming to Steam, Nintendo Switch/Switch 2, PS4/PS5. Deltarune, less than a week away. Can you believe it? So soon, so close. Deltarune. DELTARUNE. deltarune. Almost here, just outside of reach...

↑←↑→↓→

SILKSONG

LESS THAN A WEEK AWAY...

Can you believe it? Silksong, less than a week away. Silksong, June 4th, 11am EDT. Silksong, the sequel only inf years after the release of Hollow Knight. Silksong, less than a week away. Can you believe it? So soon, so close. SILKSONG. Can you believe it? SILKSONG! CAN YOU BELIEVE IT??? LESS THAN A WEEK AWAY. SILKSO—

aaqsr

NOT MY F

ELCITRA TSENI

There aren't enough ar
It's all boring old t
.-left or vertical).li
so to provide a gli ec
yteld that could bmTfl
a-rrmore adventurephte
dteo direction oo sa-s
ahhwt .gnitirw fuient
wg orieht htiw sf kob
oislg elpoep erom if-e
nriufituaeb eht otnuri
.elcitra siht ,yllin
myllanoisacco ro(thgg
rof larips ni nettirw

the government's only spy

$$\begin{bmatrix} m & a \\ t & h \end{bmatrix} \begin{bmatrix} N & E \\ W & S \end{bmatrix} = \begin{bmatrix} mN + aW & mE + aS \\ tN + hW & tE + hS \end{bmatrix}$$

SELF-EXPOSURE

The day after I arrived in San Francisco, I went to the nearest bank to set up a bank account. The representative recommended against signing up for mailed billing; not for convenience nor environmental reasons, but instead because, in exact words, “why expose yourself to public?”



“Public,” here, needs help. Certainly, San Francisco is not the wasteland that Fox News describes. Areas like Mission Bay, where Uber, Dropbox, Cisco, and the sprawling UCSF medical campus make their home, are no less safe than any street in Waterloo; they even have light rail to match. The harbourfront of Embarcadero, the sea lions of Fisherman’s Wharf, for that matter, the entire west of the city seems carefree. Live only in these areas, and you could convince yourself the City has nothing to worry about.

I don’t live in those areas.

In the City’s core—the Tenderloin, SoMa, and Mission—the consequences of the unaddressed triple crisis of homelessness, addictions, and untreated mental illness are self-evident. I’ve yet to make a morning commute without passing men left unconscious on the sidewalk. I live on a hillside; on the nearby stairway to descend the hill, several men the City will not house have set up tents spanning its width. I descend by road instead, I walk into a wafting cloud of urine, from those so City-forgotten, their only washroom is the streetcorner. I take care not to trip over the man asleep in the midafternoon sunlight, his only bed a cardboard sheet separating him from the cold earth. I pass a man with seven garbage bags attached to his grocery cart, itself filled to capacity with discarded glass bottles, the only chance at income the City provides.

At the civic center, the City Hall rises above with majestic columns, grayscale stonework evoking the image of Rome, perhaps Panem. Atop a nearby planter, a man is splayed with eyes closed, mouth open, dead to the world. Further into the Tenderloin, first responders surround a man—Hey, you awake?—he’s upright, but doubled over with his hands tucked in his shoes. In the SoMa alleyways, more yellow vests kneel around unconscious men. I walk between Mission bus stops; in sixty seconds, I pass no less than five people doubled over in the fentanyl-afflicted way. I walk through streets checking every corner, ready to flee those the City has left so desperate, their self-preservation comes into conflict with mine. I tell a friend where I live, I hear that several of her friends have been mugged nearby.

I try one day to walk home from the train station. I take Google Maps’ most direct route—it takes me through the singular pedestrian path under a freeway; two hooded men block my only path in the early twilight shadows. I about-face to a detour route. There’s a pedestrian overpass across the freeway; a man is asleep against its iron-bar door. I take another detour route. I finally successfully cross the freeway, passing the Zuckerberg hospital as I do; another man rifles

through trash on the nearby street; the Zuckerberg hospital would never take in a man made so unprofitable.

At last I ascend my hill, hoping to follow an Uber driver’s unexpected warning: be home before dark. I never consider the stairway. It has been three weeks. No one has housed the stairway people. I cannot expect homelessness to be solved in three weeks, but for these men, the City has had ample time.

One day, I walk past the Caltrain station. A woman with a grocery cart of all her possessions yells out:

Can you help me get food at Safeway?

Can you please help me get food at Safeway?

Do you have an app that lets you help people?



Why expose yourself to public?

The line has stuck with me ever since the man said it, with a knowing smile, like we were both members of some elite cabal beyond the street folk.

The problem is, I *am* public.

It would be so easy to think otherwise. I’ve taken a Waymo autonomous car exactly once, for the first day of co-op. As the sun crested over distant Oakland, the pearl-coloured Jaguar arrived at my door. With algorithmically-perfected motion, the leather-lined Jaguar smoothly drives me to the train station, no sidewalks travelled, no men sidestepped. I board the electric train; it’s well-lit, with laptop tables and clean seats clearly targeting the tech commuter. I arrive at the office; it’s a luxury upscale complex far from the City, where none of “public” may enter.

What west-side neighbourhood advocates might call safety, a Marxist might call *alienation*. With tech sector income, you’re easily able to replace grocery runs with Instacart, transit passes with Waymo subscriptions, even walks to the coffee shop with Uber calls. I have no app to help the Safeway woman, but I have so many to alienate myself from her. To relegate her to “public,” and pretend, like the bank teller, that her problems are not my own.

But there, but for the grace of God, go I.

What separates you from the alleyway fentanyl addict, hands tucked in his shoes? What makes you ‘better’? Choices? They stem from your background. Education, values, how you were raised? They stem from your parentage. Parentage, then?

That’s random luck. Trace the separation between yourself and the fentanyl addict back far enough, and all that really

separates you is a twist of divine planning or quantum fate.
That your consciousness sprouted in your body, and not his.

Had fate twisted differently, and I was him, I would want a world where I was not alienated as a thing to be “exposed to.” I would want a world where I was seen.

But it didn't. In the life I got, height and perceived masculinity grant me the privilege to fear less than many.

So I choose to walk to work each day, hoping not to disturb the addicts underfoot.

molasses

CSC FLASH

WHY IS THERE BABY OIL IN THE CSC OFFICE

Beginning of Term: By the time you're reading this, Beginning of Term will have already come and gone (hopefully along with all the free food). At the time of writing, it's scheduled for May 29th, packed with fun activities and tasty treats. But since time travel isn't a CSC service yet, what we do want you to do is share your photos from the event and tag @uwcsclub on Instagram! We'll make sure to send some love your way.

Service Update: CSC Cloud is finally back online! That means Codeybot and all your favourite CSC services (yes, even the PMC website) are up and running again. We sincerely apologize for the downtime and are working to make sure it doesn't happen again. Huge shoutout to our Systems Committee for reviving the servers at record speed, powered almost entirely by Monsters and CnD samosas.

Trivia Night: CSC Trivia Night is making its grand return! We're currently aiming for June 18th, but that date might shuffle around a bit since it's still a ways off. Expect a night full of fun questions, great food, and plenty of prizes. So make sure to show up and devour the snacks like the goblin gremlin genius you are.

Prof Talks: We're bringing back Prof Talks this term to supercharge your CS knowledge (and maybe your GPA by osmosis). Yes, there will be food and drinks, but the real stars of the show are our professors. So far, we've got two brain-boosting sessions lined up in June with Professors Freda Shi and Tavernes Barnes. Keep an eye on our Instagram for your chance to upgrade your grey matter.

Office: Drop by our club office at **MC 3036/3037** and say hi! There's a good chance the CSC will be open when you swing by. If you're not sure, just check our club Discord (linked in the footer of csclub.ca or csclub.ca/discord) to see if the office is open. CLOUD IS FINALLY BACK SO THE STATUS WORKS!

Merch: As always, we've got CSC merch for sale. But this time, there's a twist: you can now browse our full collection online! Head over to csclub.ca/merch to check out everything we have in stock. From E7 tote bags to Codey lambda calculus T-shirts, we've got your wardrobe covered in style (and just the right amount of CS major drip). Whether you stop by MC 3036 or shop online, be sure to check it out. You and I both know you want to.

Pop: The Computer Science Club is keeping your caffeine levels in check. We're still selling Celsius, the *official* fuel of CS students, for just \$2 in MC 3036. We've also got other pop and snacks starting at just 50 cents (Fuze/Nestea, Fanta, Coke etc). Come by, hydrate (responsibly) like a true code warrior.

CSC Shenanigans:

Quote 1:

@everyone WHO THE FUCK SIGNED US UP FOR ANOTHER PORN SITE

SOUROJEET ADHIKARI (VICE PRESIDENT)

Quote 2:

Bros been president for a week and already a freak

SAMIR SHARMA (WUSA DIRECTOR)

Poem of the Biweekly:

In the glow of MC's fluorescent light,
Codey beamed with joy, tail wagging bright.
A blue Shiba dog with code in their veins,
They'd conquered LeetCode, outplayed all the brains.

With pronouns they/them and swagger to spare,
They debugged in Vim with an elegant flair.
Now FAANG had called, the offer was made,
An internship earned, not just cleverly played.

To celebrate big, they oiled their fluff,
“In MC 3036, we party rough!”
Wearing a tee with a lambda in style,
They danced through the club with a caffeinated smile.

Oh Codey, our mascot, so brave and bold,
With Celsius in paw and dreams of gold,
Go shine out there, but don't forget,
Your roots are here, on the mathNEWSeret.

tung tung tung tung tung tung sahur tralalalalalalero CSC
FLASHER OUT! RAHHHH

ctdalek

I WISH I READ MORE

AN UNSTRUCTURED RAMBLE, PLUS SOME BOOK REVIEWS

I like reading, or at least I tell myself that I like reading. I do, really, but I'm increasingly finding that between my school work and the ever-expanding list of clubs I join, there isn't much time to read. I wish I read more.

Back when I started university, I told myself that I would try to read a new book every term, and I've actually succeeded at that up to now. The first of these was Vlatko Vedral's pop science book *Decoding Reality*, about information as the fundamental building block of the universe (which I got from the shelves of the DC library, so it's probably still there now), and my most recent read was a new 2024 translation by Damion Searls of Ludwig Wittgenstein's early philosophical treatise *Tractatus Logico-Philosophicus*, which is more less about the same thing but with more logic notation. Did you know that the original translation out of the German, credited to Cambridge University linguist C. K. Ogden, was actually done by his undergraduate student Frank Ramsey?

I got three new books at a PhilSoc sale last term: Shakespeare's *King Lear*, a collection of Plato's Socratic dialogues *Protagoras*, *Philebus*, and *Gorgias*, and a French language dictionary. I probably won't get around to finishing that last one, but I'm hoping to read at least some of *King Lear*. Besides those, I also have and plan to read Michael Slote's *Beyond Optimizing*, Plato's *The Republic*, Nietzsche's *On the Genealogy of Morals*, the Torah, and the Quran. (I've read the entire New Testament, so I have to do the trilogy, right?) I play Scrabble a lot, and I think reading books is an underrated way to learn archaic and obscure words to play. I've already learned two, in fact—"moiety" and "whoreson." I also learned the high probability (i.e. consisting of high-probability Scrabble tiles) 8-letter word "testator" from the book of Hebrews, though that isn't as significant because its anagram of "attestor," which is a reasonably common word I already knew.

But I digress—the point is that I like books. Especially hardcovers with nothing on the front and just the title on the spine. I think hardcovers are more satisfying to hold, and I'm convinced that their pages smell better. Twice now I've thrown away the sleeve of a hardcover book because I don't like the way they look or feel. It's plasticky and obnoxious. I thought that might be a weird thing to do, but at least one internet person and one real person have told me that they do the same, so it must not be that weird. Right? Surely not.

Anyhow, here are my (uncharacteristically terse and non-numerical) reviews:

TRACTATUS LOGICO-PHILOSOPHICUS (1921, TRANS. 2024)

It was alright. Insightful at times, but with a strange numbering system for its propositions that I didn't entirely follow. In the copy I have of Searls' translation, the original German is on the left, so you can kind of learn German while reading it. So that's neat.

THE WAR OF THE WORLDS (1898)

I'm not usually a big science fiction reader, but I really liked this. Wells' writing is very vivid and descriptive in a way that is quite unlike the (admittedly little) fiction I've read before. It also made me think about human biology in comparison to how alien creatures might be.

HOW NOT TO BE WRONG (2014)

I got this from the DC library too, back in my 1B term, and it's one of the best books I've read in a long time. It's about the mathematics of everyday decision making and contains a lot of interesting sections on the history of statistics.

PLUM BUN: A NOVEL WITHOUT A MORAL (1929)

I bought this one for \$1 at the used book store in the SLC basement before they closed a while back. It's an interesting story about a light-skinned African-American woman who pretends to be white and moves to New York. There's a lot more to it too, and I found the plot compelling, but the writing itself was kind of mediocre.

yalevoylian

ANYBODY INTERESTED IN VOICE OVER EVENT?

I want to hold an event where we'll have several prepared video clips—each around 20 seconds long—featuring famous scenes from movies, TV series, and anime. Everyone who attends will randomly get a clip and have to perform it on stage. Just imagine someone mimicking Sheldon Cooper's voice shouting "*Bazinga!*" or another person dramatically fake-sobbing Eren Yeager's line: "*I don't want [Mikasa] to find someone. I want to be her one and only for the rest of my life!*" to Armin. The randomness of the clips will keep things fresh and hilarious—no one will know what they're getting until it's their turn to shine. And the best part? People are free to edit the script... as long as it's funny.

The best part is seeing how creative people will get. Some might go all out with exaggerated voices and gestures, while others might fully commit to the drama of their scene. I can already picture the crowd erupting in laughter or cheers as each performance unfolds. To make it even more fun, I'm thinking of adding a voting system so the audience can pick their favorite acts. Also, if a lot of people can join and put the funny clips they want to act (want others to act) in the box would definitely be awesome!

AKEIJIN

THE CONDITION, STATE, OR QUALITY OF BEING FREE FROM ALL FLAWS

The aspiration to be perfect is a common sentiment that is felt. We search to be the perfect worker and the perfect student and the perfect friend and the perfect lover and so on. This flawless state where existence becomes frictionless and all pressure is alleviated is perfection. At its core, our perception of perfection is the manifestation and embodiment of “infinity.” To be perfect is to have infinite knowledge of everything that was, is, and will be. To be imperfect is to have finite knowledge of some of what was, is, and will be.

Evidently, the pursuit of flawlessness is flawed in itself. We are finite beings with finite lives that make finite choices in finite settings under finite conditions, so to pursue perfection is to disregard those undeniable truths. Nevertheless, the idealization of perfection draws us to work towards existing in a perfect state despite its impossibility. We reach out to what is unreachable. We run on the path that is never ending. We sing the song that plays forever. On this journey to perfection, every moment is a continuous performance in which the acts play by, yet the curtain is never called. Ultimately, it is a journey in which one pursues infinite experiences to gain infinite learning to obtain infinite knowledge.

This is a completely futile endeavour. It is a battle in which one reinforces their suffering and worsens their livelihood by attempting to do what is impossible. This is because the lives we lead are composed of finite experiences with finite learning that leads to finite knowledge. In the end of the pursuit of this “infinite perfection,” the sum of our finite experiences never diverges to infinite knowledge.

However, when we abandon the notion of “infinity” within perfection, there is an underlying beauty that can be felt. When we reach out to what is within grasp. When we walk on the path that can end. When we sing a song that resolves harmoniously. It is only then that we can witness the curtain call of the many plays we act in. This state of being may not provide the frictionless and pressureless existence one seeks from infinite perfection, but it is a realistic endeavour in which one can expect to witness progress. By endlessly pursuing different ends, we maximize the finite experiences we are given and we learn to accept mistakes, forgive ourselves, and live without fear of failure.

We may experience pain, pressure, stress, sadness, and suffering, but there will always be joy, love, peace, and excitement existing on the other side. Realizing this duality allows one to expand their horizons and take on risks in life whilst knowing it could lead to undesirable feelings. Rejecting the call of infinite perfection empowers us to act boldly and thrive under pressure. It gives way for us to create spectacular change in our lives that can greatly shape who we are. Paradoxically, even if we cannot manage to achieve infinite perfection, in the end of the pursuit of this finite perfection, the sum of our endless finite experiences can potentially diverge to a different form of infinity.

The bottom line is that we are not defined by being the infinitely perfect worker, student, friend, lover and so on. Rather, a form of perfection can be found within being a finitely good worker, student, friend, lover, and so on. We all should give ourselves the right to better ourselves in a sensible manner and maybe then can we find the infinity we seek. This quote by Haruki Murakami from his novel *Kafka on the Shore* summarizes it perfectly: “If I listen to some utterly perfect performance of an utterly perfect piece while I’m driving, I might want to close my eyes and die right then and there. But listening to the D major, I can feel the limits of what humans are capable of—that a certain type of perfection can only be realized through a limitless accumulation of the imperfect.”

SujyP

INFINITE GAMES, BUT NO GAMES

THANK YOU JSCHLATT

It’s a Thursday night in Waterloo. A light spring drizzle adds to my apartment ambiance. It is already filled with the sound of the air conditioning and my PC’s light hum. I open my Steam library. I check Discord for a moment. Huh. None of my main crew is online, and I’m too anxious and not in the mood to join an acquaintance’s VC. Back to Steam. What shall I play?

My library is filled with masterpieces of games I’ve loved over the years, games from my childhood, games I have hundreds of hours on. So many games... “There’s nothing to *play!*” I say to myself. Nothing that scratches the itch I have.

Yes, *Lego LOTR* demands to be finished but I don’t want to look up a tutorial to finish the game. Yes, *Hades* is a classic on a night like tonight, but I don’t have the energy to choose between the powers of egotistical gods. *Destiny 2*? Dead game, and I don’t wanna run strikes for the next two hours. *Marvel Rivals*... good game but I’ve already completed the challenges for the week. *Minecraft*? Now that I think about it, I *was* in the middle of building a city, and it *would* be soothing... Butttt the two week *Minecraft* phase was two weeks ago. Dang it. I could reinstall *Cyberpunk 2077*, or get a black border in *Bloons TD 6*, I could even spend time on *PC Building Simulator 2* making my dream replacement PC, but the truth of the matter is clear.

There are Infinite Games, but at this moment in time, there are No Games.

Looks like I’m playing *Freecell Two Decks* then.

Jochemist

TRYING TO SHOOT MYSELF IN THE FOOT AS HARD AS POSSIBLE WITH COURSE SELECTION

For context, I am a CS/BBA Double Degree student in 3B. Recently during course selection, I have discovered that I technically only need 18 more courses to graduate! With a five-year schedule, I can safely complete my degree by 5B and all will be good...

However, I can decide to be a masochist and overload on every single one of those terms, and miraculously I will have 24 course slots, and magically I will have created 6 more course slots to fill with literally anything that I want. And with those 6, I can put 3 to doing an entire CO minor, and another 3 into doing some Pure Math courses. I'm sure the result would be epic.

I feel I should clarify that I haven't completely lost my mind, and that I do not love pain. Since first year I realized that to really succeed I should push my boundaries—take advanced courses, overload maybe, but always try to put in as much effort as possible. And somehow, even through some really rough terms, yet still me and my GPA have survived.

Thus, I must aim for my foot more strongly. I am determined to push myself until I finally fail, and if by the end of 5B I somehow haven't found my academic breaking point, then I will not have any idea what to do. (Subject to also not going for guaranteed death) ((I would love to take matroid theory but I think that would guarantee failure; and I would like to at least give myself a chance))

So maybe I'll burn out by 5th year, or maybe I'll come out the end of this with a unique appreciation for the people majoring in CO and in PMATH. Either way, I am sure it is worth it.

If you're willing to help me on my quest, I'm willing to take suggestions on courses to take! Right now, the plan with what to do with the overloaded slots (over 3 years) are:

- CO 330—Combinatorial Enumeration
- CO 342—Intro to Graph Theory
- CO 352—Network Flow Theory

These 3 above, along with MATH 239 and CO 250, will be enough for a CO minor. Currently I'm not taking a 4XX CO course because 1. I am dumb and 2. I would prefer breadth over depth.

- PMATH 333—Intro to Real Analysis
- PMATH 347—Snewps and Rings
- PMATH 370—Chaos and Fractals

Again, I am aiming for breadth over depth with PMATH. I would love to take full Real Analysis or Complex Analysis or Geometry but again I am OUT OF ROOM

anyways thank you for listening to my rant. I must now go back to attempt to survive this nightmare that I have created for myself through overloading

andoiiii

MOVIE REVIEW: A MINECRAFT MOVIE

I am so sorry for shitting on the Pokémon movies I've previously reviewed. This was so much more unbearable.

Had I been a little luckier, I wouldn't have seen it. But my friend suggested we watch it in the last week it was in theatres, and I was sort of interested. So fuck it, I went. By the way, the theatre was almost completely empty. There were four other people there, other than me and my friend.

The best way I can describe the experience is this. You know how people complain that Marvel movies have too much throwaway comedic dialogue? Imagine that, but for the entire movie. It also felt like nothing was being taken seriously for the entire movie and the acting was all obviously fake, which might have been good had they leaned into it more. But it had too many action movie elements for it to work, so it just felt more awkward than anything. For instance, there's a scene involving an Enderman that has a lot more of a serious tone than the rest of the movie. I actually liked that scene as a stand-alone part! But it stuck out in a bad way because of it.

I had every expectation that it would be cringey, of course, so I don't care that much about that. What really gets me though is that there weren't even that many Easter eggs. I was hoping for more things that you could point to and say, "hey, I understood that," like the Technoblade reference and the classic lava chicken cooker. But there wasn't enough of it to feel satisfying, and I think that speaks to the movie in general: it doesn't commit to anything hard enough to work, and as a result it fails spectacularly.

In conclusion, it's a 2/10 in my eyes. I respect the creative vision and the effort to make things accurate to the game, and for sure it's commendable. But as a movie, it does not work. There's an idea of "so bad it's good;" this isn't that. The movie is just bad. If you want a compelling Minecraft-based story, just watch Alan Becker's Animation versus Minecraft series on YouTube instead (particularly up to episode 30).

hyperlynx



LEAST CURSED mathNEWS PROD NIGHT PIZZA

Let n be the ASCII code of the first character of the next pizza.

Let x be the total number of suggested pizzas.

If $n \pmod{17} = 0$, this pizza is eliminated; terminate.

Likewise, if the next pizza does not exist, terminate.

Otherwise, the $n \pmod{3} + 1$ th ingredient is the first ingredient of the $n \pmod{x}$ th pizza.

tomato sauce

CAREER TIPS FOR THE TWO KINDS OF STUDENTS

FROM A GRAD STUDENT

I feel like there are two types of students, based on what motivates them to be in university: money and research. Money because companies are willing to pay more for those with degrees. Research because some people really like thinking about problems. In reality, everyone lies on a spectrum—you need money to live, and people rarely choose subjects to work in without having at least some aptitude for said subject. However, you can generally tell which side you lean towards based on what you want to do after you've finished your assignments.

Of course, as a once-undergrad-now-grad student here, I like it more when people are motivated by research. It's easier to mark a good assignment than one where it's clear the student "threw the kitchen sink." But it's also understandable that some subjects are going to appeal to people a lot more than others. By the way, if you're bored in class, thinking "this content is too easy, let me work on **REAL** problems!" just chat with the prof after class. They're usually very happy to discuss their research, but the course curriculum forces them into teaching a specific set of topics. If you want more interesting work, trust me, there is far more interesting work to be done than there are people that can do it. The world needs more people that deeply understand the internals of systems.

If money is the motivating factor, here's a little secret: good products don't make money, paying customers do (also venture capitalists). The lion's share of paying customers is held by the largest companies, so if you want to make the most amount of money, you should focus on companies like FAANG and other big names. Even if you like the idea of working in a startup, it's better to get a big name on your resume first in order to increase your salary (plus it makes it much easier to get a job afterwards). Make a point to scan job boards every day to be at the top of the resume pile (companies start and finish hiring much earlier than you think).

Keep revising your resume. Keep grinding Leetcode. Consider going after jobs that are less specialized and perhaps overlooked by some of the more "brilliant minds," like frontend development. Don't worry about getting stuck in that job, because you can always re-skill later. Speaking of which, you should also consider eventually becoming a manager, since it tends to pay more while also being less technically demanding.

If research is the motivating factor, just remember that you're playing the long game. Your goal is to be one of those staff engineers that people turn to when all else fails. This means putting in extra time to really learn the details of a system, while others are hyper-optimizing for interviews. Especially if you end up doing grad studies, you can often feel like you're starting way behind everyone else. Just remember that this allows you to work on the problems that you find interesting (a lot of jobs are likely not the work you want to do anyways), and that deep knowledge becomes much more useful at Senior+ levels.

That being said, do put a significant amount of time into trying to get FAANG and other big names. During hiring season, try to take a look every week, and do at least a bit of Leetcode (websites like [hellointerview.com/learn](https://www.hellointerview.com/learn) should be enough if you're good at generalizing patterns). I think you'll be surprised to see that the bar is not that high, even for big companies (unfortunately, getting hired has more to do with applying at the right time plus referrals). The reason for going after big tech companies (specialized positions are good too) is because they're the ones that will care a lot about efficiency, instead of just bashing out any solution. Plus, if your goal is to become an authoritative source of information on a subject, the reality is that people take you much more seriously if you're affiliated with a big name company.

SaltOverflow

A SHORT HAIKU

Writing some filler
Must be for free pizza, right?
I'm not at prod night

Lars Nootbaar



N WAYS TO GO TO THE NEXT STEP IN A MATH PROOF

- Thus,
- Therefore,
- It follows that,
- It easily follows that,
- Hence,
- Whence,
- Henceforth,
- Whenceforth,
- As a result,
- Resultantly,
- Consequently,
- This gives,
- This implies,
- This entails,
- This means,
- Note that,
- So,
- So that,
- Thereupon,
- For that reason,
- Ergo,
- One can then see,
- One can then obviously see,
- From the above,
- Now observe,
- From this,
- Then necessarily,
- Then trivially,

notoh

IF I CAN JUST CONVINCE FIVE PEOPLE TO BECOME MATH MAJORS...

One of my relatives once said to me, “What do people even do with math degrees? Do they just become math teachers?”

I told them that makes it sound like math is some kind of Ponzi scheme, where the only use for learning it is teaching it to someone else.

They paused, then said, “Well is it?”

And I still don’t have a good answer.

eudaimon

TOUCHING GRASS IS A LONG FORGOTTEN ART

I TOUCHED GRASS

Long ago, before time had a name, every animal and alleged human touched grass. Then we named time, then we started to name our hallucinations (math), and make them consistent. Over time, we forgot how to touch grass.

Nowadays, only the very young and innocent touch grass. Whilst the old, and allegedly wise touch grass. Sadge

We should go back to touching grass.

Grass s Fiber

MY EXPERIENCE PLAYING SCRABBLE

Recently, I played in a Scrabble tournament (yes, they exist), and won \$550. Here are some of my own favorite plays from my time playing Scrabble:

QWERTY: I once played the plural form of this word, QWERTYS, scoring 111 points. The word designates the standard keyboard layout, as in a QWERTY keyboard.

STOPWORD: This is my highest scoring move ever, at 203 points. A stopword is a common word such as he, the, at, etc. that is ignored by search engine algorithms, as they do not convey significant meaning.

CROWDIE: I found this play as my only winning move in an online match against a friend. It is a kind of Scottish cheese, yum.

WILDFOWL: The lowest-probability word I ever managed to play, which my opponent unsuccessfully challenged. Given the tile distribution of scrabble, certain words are much less likely to appear in games. This one, having only two vowels, with two W’s and two L’s is particularly unusual. The word refers to ducks and geese as a whole, similar to waterfowl.

foxshark

What a remarkably
useless thing a piano is.

SIMON WOOD

THE TRAP

"They said they found her last email, sent to her professor. Just a blank document with 'I finished it!' written right in the middle. Nothing else," Sam's roommate whispered.

"And you believed that?" Sam replied.

It was always the same, his roommate always believed in those kinds of rumours. He jumped at every floorboard creak at night, every flickering light in an empty hallway; but Sam had yet to encounter anything that didn't have a logical explanation.

"Of course!" Sam's roommate's eyes widened. "Now, even if you don't believe it, do yourself a favour and do not, in any circumstance, go study at the QNC basement tonight!"

"Why? So I don't disappear like that girl? Please, can't you see this is just some lame prank?" Sam snapped, rolling his eyes.

"Well, at least I tried." His roommate sighed, shaking his head as if already mourning Sam's inevitable demise.



Even though he was already well into his third year, Sam still hadn't mastered the art of finishing his assignments early. So here he was, ignoring his roommate's advice, going down step by step to his favourite place of study. That's where he was going to finish the essay he had procrastinated on for the last two weeks. He never went there late at night though; he was usually at home by this hour, but he had not been able to resist his bed lately. He was scared of going home, telling himself he was only going to take a nap, and completely ignoring his assignment once again. As he finally reached the basement of the building, unknowingly he had walked straight into a trap.

It all started with a rhythmic mechanical humming. He looked at the clock, it was already ten past midnight, certainly there couldn't be anyone working at that hour. He got up and walked towards the door near his desk, the noise getting louder and louder as he got closer to it. It came from that room! But then again, it was probably just coming from a machine inside that lab. Someone could have easily programmed it to do something at this hour, and now it was simply following their orders.

This was enough reason to ignore it, so he went back to his chair, and did his best to focus on his assignment again. He already had an outline and some text-evidences, the matter now was to write those damn paragraphs. The first sentences were a pain to begin, but once he started finishing his first paragraphs, he found that things were getting easier. Maybe it was just the fact that he was seeing some progress, because that meant he could finally leave that place and the accursed noise in his ears.

Suddenly, he jumped at the sound of a hiss, seemingly coming from that same room, and as he was getting ready to get up again and look for some clues on what was really happening, the humming stopped. Huh. He interpreted it as a sign that the machine was giving his ears a well-deserved break, but still, he was eager to wrap this assignment up as soon as he could.

He was wrong though: just as quickly as it stopped, the humming came back, powerfully insisting. It was starting to get too much for him, but he was so close, there was only the conclusion left now...

However, he didn't know that the worst was yet to begin.

He stared at the document in front of him, as he couldn't decide what would be the best way to transition to the final paragraph. He didn't want it to feel super abrupt and... it was then that he started to recognize a pattern embedded in the inescapably loud humming, it sounded like a voice! However, he couldn't exactly decipher what it said, was it even in English?

Okay, this was getting creepy even for him, maybe his roommate's story was true after all, and he definitely didn't want to figure it out. He grabbed his computer and ran to the stairs as fast as he could. Not fast enough. Something pulled at his feet, making him lose his balance. "FUCK!" As he fell into the cold basement floor, everything went dark...

[Editor's note: the ending is an exercise to the reader! The author gave up lol]

leah

SUMMER IN CANADA

Canada's summer does not begin in May
Nor in June, but July someday
T-shirt weather one week, snow the next
Weather in Canada will leave you perplexed.
So prepare for a few days of heat
Cause it'll soon be cold again, ain't that neat!

mathgeek

WATCH THUNDERBOLTS*

bucky barnes. yelena belova. a bisexual's wet dream (mine)
[Editor's note: SO TRUEEEEE]

gaya

MC/DC BRIDGE X M3/MC BRIDGE EROTICA (2/4) BUT IT'S ALL BRIDGE EUPHEMISMS

M3 BRIDGED ON DC'S BRIDGE TILL HE BRIDGED

DC was taken aback. He stared into M3's puppy eyes, puzzled by her ask. "What?"

"I said, kiss me. Like this."

M3 slightly tilted her head, grasped DC's shoulder cap and gently brushed his lips, sending firework sparks all through her bridge body. The comfort she needed was satisfied as DC cradled the top of her bridge, wrapping his arm around her soft waist to match the rhythm. He pressed back with a bit more pressure as his fingertips crawled deep into her hair and the butterflies in his stomach fluttered for more.

The simple yet warm and electrifying peck melted into a deeper yet relaxed lock, with DC tracing downwards along M3's trembling spine. It became evident that this wasn't just about comfort anymore; M3's tongue slowly inched towards DC's tender lower jamb lip and slowly glided along the frame, inviting the bridge in his mouth to play to the beat of her thundering heart. He followed suit, sliding his tongue along M3's while caressing her lower back. He could feel her warm, heavy breath travelling inside him, tickling his body blessed with bliss. M3 swirled the tip of her bridge around DC's like sweet, creamy soft-serve, mercilessly teasing him as she slowly pulled her jambs away and shifted her sight straight to DC's eyes.

"Thanks, I feel a bit better now." she gently murmured, her cheeks blushing like blooming cherry blossoms.

"Of course, M. Would you like me to calm you down more with some more kisses?" DC questioned, lightly breathing through his smirk.

"Sure, but you take the lead." M3 giggled.

"I'll lead the way alright."

DC knew he wanted more of his friend, more of her coconut lotion scent and more of her skin to touch. He arched his neck towards the back of M3's ear and slowly pecked around her lobe. M3 stretched out and grinned with protruded cheeks as DC's lips inched down the side of her neck to her clavicle beams.

"How's it feeling so far?" he wondered.

"It feels good. But you know what'd make it better?"

"What?"

"Follow me."

M3 jogged towards the pearly steps, her tousled brick hair bouncing through the air and silky clothes swaying with

her strides. DC eyes' fell from M3's sloped shoulders, to her narrow hips to her smooth legs as he followed at a moderate pace. When M3 reached the slabbed floor, she turned around and sat down on the second step, lanes wide open. DC was shortly shocked at her forwardness before she pulled off her camisole from the front, revealing her perky, shapely arches. Enjoying the view, he smirked and kneeled right in front of M3, their faces merely inches apart.

"Touch me lower." she hushed.

DC obliged, grabbing M3's waist firmly with his right hand and lowering his head down to her abdomen, pressing his supple jambs to her soft belly. Caressing the side of one of M3's arches with the other hand, DC sighed "God, I love your body, M."

M3 flushed harder, cheeks beaming and her doe eyes fixated down to DC's subtle V-beams poking below their tank. She imagined what laid underneath all of DC's clothes while her right arm limply rested on DC's shoulder, her fingertips floating across his back, the other reaching down to roughly trace from his upper hip and down the left indent.

Suddenly, DC jerked his torso back, let go of M3's waist and tugged his shirt collar upward, exposing his smooth chest and a dainty silver chain in one fell swoop.

"There we go, much better. Now I can feel you, which is all I want right now." he said, his hand reaching to the back of M3's head and his face leaning into M3's.

His lips swooped in, saving M3 from her thirst of passion, as the fading pillowy touch soon morphed into tongues caressing each other. At the same time, DC slowly slipped two fingers upward along M3's girder sternum, sensing her heart's current, which set the rhythm to their melodic kisses and synchronously dancing bodies. Continuing this symphony, DC lightly retracted their bridge away and gently nibbled along M3's tender bottom jamb, cupping her left arch and massaging the flesh with his palm.

M3 lightly gripped the supple sheet metal on DC's back and let her left hand swish up and down DC's thick thigh lane, fingers travelling behind to the side of his back tunnel. One last peck preceded a spiral traced on M3's left arch and kisses on her decollété, sending M3 herself into a spiral of joy and desire.

DC lifted his head and tilted his eyes to M3, intently looking into DC's coffee eyes and lightly smiling.

"Does that feel good?" DC softly questioned. M3 nodded, with her hand swerving forward down DC's lane and the grin as strong as before.

Now with approval, DC's lips travelled down her road as his steel beam fingers trailed the bracing of her arches. When DC's tunnel reached M3's keystones, he blew his wind on each one before tracing her voussoirs. Both M3's mind and body floated through the steamy air as DC's kisses took a roundabout around her stones, blood rushing through pipes to all the crevices of her bridge. Eventually, DC's jambs met M3's pink, protruding crowns and used his steel tips to smooth and apply tension to them. M3 lightly gasped, squeezing DC's left lane before letting her hand venture to his brick.

DC soon started licking all around her crowns, flicking them with his taut, rough bridge. His entrance pursed as he sucked on each while M3 arched back and swayed her body with the tempo of his movements. She couldn't feel her worries or time passing anymore, just the joy flooding through her beams and DC's radiating energy flowing from his head resting on her bridge to the bridge she could feel through his concrete cotton shorts. DC could feel M3's sensitive bridge material tense up and engorge inside his wet tunnel. His door frame became wider as his teeth lightly nibbled onto her keystone while firmly applying mortar onto the other before switching and working on the other crown.

"Mmmm, D-" M3 breathily murmured. "Mm, D, you're too good. Let me have a whirl now." she offered, clutching his rising drawbridge through the concrete..

Dollar Store Person

N THINGS CURRENTLY WRONG WITH MY APARTMENT

- The bar that the sliding bedroom door is attached to is not actually attached to its support on one side
- There was a silverfish in the washroom at one point
- In-unit laundry is non-functional
- In-unit dryer is ALSO non-functional (and it has been for months)
- Maintenance can't fix the dryer because the part that's the issue is proprietary
- Administration won't do anything because they know they'll get paid either way
- It's a fixed-term lease, so I can't leave
- They weren't turning the AC on until May 23rd to save money, so I had to keep the blinds closed to keep it cool
- I do not get sunlight because there are blackout curtains
- I have become addicted to Stardew Valley
- This isn't even about my apartment anymore, is it

Sexy_Software_Babe

I BOUGHT MINECRAFT LAST MONTH

The first time I played *Minecraft*, it was early 2013, and Pocket Edition had just received the Nether Reactor, to compensate for still not having the Nether.

I did a little Google search and learned I needed four gold blocks to make my Nether Reactor, so I spent the entire summer between grades three and four mining for gold. By the end of the summer, my Nether Reactor was ready, so I activated it, and the next five minutes became the biggest disappointment of my entire life.

The game just added some Nether-y blocks in the shape of a big tower and dropped random items, like mushrooms. I didn't touch *Minecraft* for the next 12 years.

So now, after sufficient time for *Minecraft* to be cleared of its terrible reputation, I've gone ahead and bought it.

Three weeks later, I've clocked almost 40 hours in game, I've died to creepers and lava and drowning and witches, I've given wandering traders buckets of milk, collected blaze rods, and reconnected with an old friend over a shared *Minecraft* world.

I also may have developed a slight addiction. Please help.

no pun indented

WALKED INTO A SHOE STORE THIS PAST WEEKEND

I needed some new shoes. Sometimes it's tough to get ones with a wide enough toe box, but those are healthier for you.

As I was perusing the aisles it hit me. An overwhelming wave of sadness. Deep, churning, cold sadness. Suffocating, all-encompassing sadness. I felt like I was drowning deep underwater, deeper than light could travel, so far below the surface I couldn't tell up from down. So dark I couldn't even tell if my eyes were open or shut, intense vertigo hit me as I was roiled and beaten by the sadness, my lungs felt like they were filled with lead, my brain felt like it was being crushed as my skull was being compressed on all sides.

So much sadness all around, it saturated every fibre of the shoe store. It took me a minute to realize what it was.

An entire aisle of baby shoes for sale, and not a single pair of them had ever been worn.

aphf

NO PLAGIARISM HERE

gridCOMMENT 158.2

dear gridWORDers,

i recently did an old nyt crossword with a really fun theme, so i took a page out of their book and wrote the themed clues for this **gridWORD** in the same format. i don't think they're anywhere near as sensible and clever as the originals, but what can you do when all the good ideas are taken??

last time, i asked what you are looking forward to this summer, and you all said:

- 3:30 AM **gridWORDing**: *seeing goslings* :)
- awmlet: *getting a gold card before you*

i, too, am looking forward to seeing all the goslings. i think the geese are probably just misunderstood. 3:30 AM **gridWORDing**, please pick up your prize at the **mathNEWS** office at mc 3030!! this issue's **gridQUESTION** is: if you had to be any YouTuber, which one would you be? for me, i think i was quite jealous of theoddsout and the try guys. don't forget to submit your completed **gridWORD**, **gridQUESTION** answer, and a pseudonym to mathnews@gmail.com or the **mathNEWS** office at mc 3030 by 6 pm on monday jun 9 for the chance to win a prize :))))

cheers,

spaghettiiinhalers

ACROSS

- Degree granted by the University of Waterloo
- Baseball's Mel
- Acid
- Faux ____
- Deception
- Eucharist cup
- Cleopatra's undoing
- Not quite right
- Guarded
- Our Southern neighbour
- Place an obedient, well-loved animal companion named after kitchen cookware in a fight*
- Formerly Tolkien elves
- "As you ____"
- Loud
- Hazelnuts' alias
- In the manner of
- France's longest river
- Instruction to a man to forbid containers of rabbit-shaped candies*
- Downloaded novel
- Bard's "before"
- Exile
- Made less sharp
- ____ vera
- Levelheaded
- Person with a stutter inquiring about a soaked intelligence*
- Health resort
- Caribbean nation
- Poem of praise
- Always, to a poet
- Soup beans
- Kind of sleep
- Attempt
- Nonetheless

- Born: Fr.
- Catch a few Zs

DOWN

- Nickname for Pete Miller (The Office)
- LP player
- Nimble
- Happens
- Roofing material
- Waterproof material for campers
- Opposite of weight, to an aeroplane
- Atlantic fish
- Strike out
- Prince's storied counterpart
- Group
- Floods
- Grassland
- Luau food
- 12-year-old, e.g.
- Yap
- Bar order
- Fled
- By chance
- Certain light rail in Waterloo
- Ballot abbr.
- Buddy
- Moisten
- Lawyer's org.
- Instantly
- Fancy neckwear
- E.U. member
- Madness
- Fulmer who cheated on his wife
- Part of a saw blade-tuning toolkit
- One who fled to wed
- ____ public
- Dilly-dally

- Discomfort
- Permit
- Spot
- Unsignly
- Forest unit
- Left
- Harvester ____
- Threadbare
- Inspiration
- Ryan Howard's role (The Office)



Drop your gridWORD solutions off at MC 3030. And yes, we do award points for creativity.

A PERPETUALLY BORED mathNEWS EDITOR

1	2	3		4	5	6		7	8	9		10	11	12
13				14			15					16		
17				18								19		
20			21								22			
			23								24			
25	26	27					28	29	30	31				
32							33							
34			35	36	37	38						39	40	41
			42									43		
44	45	46							47	48	49			
50								51						
52				53	54	55	56					57	58	59
60				61								62		
63				64								65		
66				67				68				69		

Thanks to everyone who actually came by the office to drop off their gridWORDS last week. It was nice to have an excuse to use these filing cabinets again!

lookAHEAD

SUN JUNE 1	MON JUNE 2	TUE JUNE 3	WED JUNE 4	THU JUNE 5	FRI JUNE 6	SAT JUNE 7
------------	------------	------------	------------	------------	------------	------------

Oscar the Grouch Day		Repeat Day Repeat Day		Waterloo Game Jam begins, 5:00pm, QNC 1502		
----------------------	--	--------------------------	--	---	--	--

SUN JUNE 8	MON JUNE 9	TUE JUNE 10	WED JUNE 11	THU JUNE 12	FRI JUNE 13	SAT JUNE 14
------------	------------	-------------	-------------	-------------	-------------	-------------

Waterloo Game Jam ends, Game Demo Fair begins, 5:30pm, QNC 2502	mathNEWS 158.3 production night, 6:30pm, QNC 1502		Faculty of Math Class of 2025 Convocation Day		mathNEWS 158.3 comes out, whether we like it or not	World Juggler's Day derailed's convocation
---	---	--	--	--	---	---

LAST ISSUE'S gridSOLUTION

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

CANADIAN UNDERGRADUATE MATHEMATICS CONFERENCE (CUMC)

JUNE 23 – 27, 2025



CUMC is coming to Waterloo this year! Are you interested in mathematics research? Have your chance at a conference dedicated solely to undergraduates! Attend this year's CUMC at *Waterloo* and enjoy student talks, featured speakers, workshops, networking events and an incredible amount of free food! And no, the free food is not pizza! You can also present a talk to other undergraduate students from across Canada and share your passion for math with others.

More information and registration at <https://uwaterloo.ca/cumc> or via the QR code!



CUMC Organization Committee