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"WHAT WOULD YOU ASK FOR A mastHEAD QUESTION?"

Hello dear readers, and welcome to the fifth **mastHEAD** of the term, also known as terrifiED's quarantine journal[1]. Today, however, I write not about personal tea and gossip, but about a matter of serious public interest.

Let me tell you about a disease that has been plaguing universities around the world, an affliction so contagious that even the mere mention of it is enough to cause infection. An estimated 99% of students on this campus are affected, and it is predicted that the lucky 1% only have a few weeks before they too will succumb to this maddening malady. This scourge goes by many names, from "online school syndrome" to "Zoom fatigue", but you may know it best as "I'm three weeks behind in all of my classes."

This is a dangerous and destructive contagion that has no manners and knows no bounds. Its effects are devastating, ranging from failing grades to desperate 3 a.m. Piazza posts. Its prognosis is not good; fewer than 5% of cases manage to recover fully. Around 15% of cases manage to recover for a couple weeks, but are unable to fight off successive, more vengeful waves. There is no known vaccine or cure.

Some have suggested that we are doomed to live with this disease for eternity. This line of thinking is overly pessimistic and should be shamed. Others have suggested that the effects of this pestilence will lessen with time. This line of thinking is overly optimistic and should be met with an invitation to complete five extremely difficult assignments by tomorrow.

Thankfully, there is a light at the end of the tunnel. A wildly effective treatment called "change the playback speed of lecture videos" was recently discovered, and preliminary results show that 95% of treated patients are able to fully recover in less than a week. Being heavily related to the treatment for procrastination known as cramming, side effects are expected to include insomnia, caffeine dependence, elevated levels of stress, and minimal improvement in grades.

All this is to say that I've been running catching-up-with-my-courses Any%, and that sure, speedrunning is gonna fail me sooner or later, but until then it's gas gas time baybeeeeeee.

terrifiED
Editor, **mathNEWS**

1. With apologies to itorED.

ABALD MAN	What would you ask for a **mastHEAD** question?
JEFF	Could this please never be a **mastHEAD** question ever again?
APHF	What repercussions should the editors face for putting "What would you ask for a **mastHEAD** question?" as a **mastHEAD** question
FINCHEY	What's a **mastHEAD** question?
TENDSTOFORTYTWO	allinfavorofmyleappidayproposalsaywhat?
A COOL PEN NAME	How did you think of this extraordinary question, "What would you ask for a **mastHEAD** question?" Truly inspiring.
DERIVING FOR DICK	Why is "What would you ask for a **mastHEAD** question?" ~~a terrible~~ the **mastHEAD** question?
QUANTUM GOOSE	When quoting a question within a question, does the question mark (1) appear "within the quotation?"; (2) appear "outside the quotation"?; or (3) appear both "within and outside the quotation?"?
CC	Finna write word here to make sure got answer since **mastHEAD** question seems broked
ROYAL NO.69 MILK TEA	Are any of us truly qualified to ask a **mastHEAD** question?
BOLDBLAZER	Wait a minute… This is just an attempt to get us to do this work for you!
BEYOND META	Why are you taking my shtick but doing it poorly?
GOD⚡pEED	This is weak and I will not participate.
CLARIFIED	I don't know, I can never think of a good question. That's why I usually leave it to the writers to make one up for me.
TERRIFIED	Instead of thinking of **mastHEAD** questions, would you like to do my assignments for me?

ARTICLE OF THE ISSUE

Article of the issue goes to A cool pen name for My friend asked to borrow my stuff and I almost said no. Highly relatable, very funny, contains all the needed ingredients for AOTI. Good job.

Your prize is ~~a $25 Conestoga Mall gift card~~ irrefutable proof that the rest of this paragraph is filler because we didn't get enough **mastHEAD** responses. Unfortunately, though such a proof does exist, it is also too long to fit within the confines of an AOTI blurb. I would suggest coming back in 300 years.

terrifiED
Editor, **mathNEWS**

elseWHEN
11 YEARS AGO TO THE DAY

It's **elseWHEN** time! Let's look into the past and see what wisdom we can glean from our mathie ancestors. Here's an excerpt of 10 Benefits to being a Waterloo Math Student by theNewGuy, from Volume 111 Issue 5, published on Friday November 20th, 2009.

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And now, in no particular order, 5 reasons to be a math student:

1. Your liver will love your University years.
2. You will have a very low chance of contracting an STD.
3. When you get into the real world, you'll be glad the workload finally decreased.
4. You will never get a sunburn through your whole degree.
5. You will learn a bewildering array of obfuscating vocabulary, allowing you to effortlessly confuse anyone but other math students.

And now, again in no particular order, 5 reasons you should date a math student. If you are reading this though, you are likely in math already. Whatever.

1. We will always remember anniversaries and birthdays, within an error of plus or minus 183 days.
2. In general, we are available.
3. We are used to staying up all night.
4. We don't repeat mistakes. If we don't get it right the first time, we'll get it right the second.
5. We can differentiate ourselves to be tangent to any curve.

ৼ

Aren't you happy you decided to be in Math now? And who knew we were such a catch?

clarifiED

BREAKING NEWS: TRUSTED ORGANIZATION FAILS AT COUNTING

During this past month, there has been a lot of focus on *counting*, and the accountability of government institutions into getting this simple process right. Here at **mathNEWS**, we are shocked and saddened to announce that one of these organizations' reported count was wrong. It shook us to our core. How could we trust the system which governs us if we could not rely on it to accurately *count* and report the results: thus defiling our most sacred norms.? And by *count* and *organization*, I obviously mean the *number of days in a year* and *MathSoc*.

You see, MathSoc this year celebrated Pi Day on November 10th and claimed that this was due to it being the 314th day of the year. But you see, dear reader, 2020 is many things: an isolating nightmare, a prolonged case study into where capitalism fails us as a society, a number with a repeating pattern, and also a **leap year**. Not only is this year *terrible*, but it's *one day longer* than most years. And so the actual Pi day this year was in fact on November 9th.

And to add insult to injury, the MathSoc post which made this false claim also broke the MathSoc logo usage guides. A guide that they paid for. A guide that you, dear reader — likely being a math student who pays fees to MathSoc — *paid* for. The tie in the MathSoc logo should be white, but was instead yellow in the post.

Obviously this recent development created tension with MathSoc and its membership. Here at **mathNEWS**, we proposed they rectify this off-by-one error by giving out twice the number of pies. This should please all the pedants in the Math Faculty (this being everyone in the Math Faculty) and the Tauists who would feel closer to the true Circle Constant τ = circumference/radius, while also satisfying all students who are hungry for pie. Which once again is all students.

Beyond Meta

DESIGNING A SYSTEM OF PI DAYS SO THAT WE GET ON AVERAGE 3.14 PI DAYS A YEAR

We all love pi. Tau *is* better, but it sadly doesn't have the mainstream appeal, so on average, we all love pi more than we love tau. In honor of our love for pi, MathSoc celebrates Pi Day once every term:

- March 14 (3/14 as MM/DD) for Winter
- July 22 (22/7 as DD/MM) for Spring
- November 9/10 (314th day of the year, depending on leap-ness) for Fall

That makes it three Pi Days a year. Three, like a certain circle constant we all love. But $\pi \neq 3$, $\pi \approx 3.14...$. So can we do better? Can we get, on average, 3.14 Pi Days a year?

I want to do this not by celebrating fractions of a Pi Day, but rather by adding "leap Pi Days" every few years. This is mostly because it's hard to celebrate exactly 0.14 of a day, and everyone knows about the concept of leap days anyway (thanks, Caesar!). So the first question is: how many leap days and in which years?

Traditionally, pi is approximated as $\frac{22}{7}$, and it would be natural to ask for 22 Pi Days over 7 years, so one leap Pi Day every seven years. The next really good approximation I was able to find was $\frac{355}{113}$ [1], which corresponds to 16 leap Pi Days every 113 years. Both of these are really good (I like the latter in particular as it takes us to 3.14159 precision), but in both cases, the denominators are super awkward with respect to base 10, which is how we number our years. This means that there is no easy way to look at an year and tell if it's a Leap Pi Day Year (Or LPDY for short).

Suppose we start numbering our LPDYs at 2007. Then 2007 is an LPDY, 2014 is one, 2021 is one… 2098 is one, and then the next one is 2105. Notice how the last two digits aren't consistent across centuries — because 7 isn't a factor of any power of 10, there won't be a consistent pattern arising in the digits of LPDYs like there is for leap years. This makes it really hard to tell at a glance what year is an LPDY — is 9434 an LPDY? It is, but there's no way to tell that at a glance, unless you can compute $\left\lfloor \frac{9434-2007}{7} \right\rfloor$ at a glance (good for you if you can, you're a tiny minority!). Notice that it also places a special emphasis on the start year — if we had started our LPDYs at 2107 instead of 2007, 9434 would no longer be an LPDY, but now 9436 would be. All this is pretty ugly, in my opinion.

We want to align our LPDYs with the base 10 system of counting, so let's look at it from that perspective. Currently, 100 years would have 300 Pi Days, and we want 314. So 14 leap Pi Days over 100 years. Coincidentally, 98 is a very close multiple of multiple of 14: 14 times 7, in fact. So we could have extra Pi days on every year whose last two digits are multiples of 7. So LPDYs start off like 2007, 2014, 2021, …, 2098, and then we have to skip 9 years to get 2107. This way, we get the consistency we want — the way the scheme is set up, it enforces a rule on each LPDY, including the one that is used

to start the scheme. So as long as you follow the rule to begin with, the LPDYs will always be the same! So if you start on 2007, then 9435 is the LPDY in the decade we were discussing above. If you start on 2021 (the next LPDY with this scheme), then 9435 is still the LPDY in that decade! The only problem is the one skip of 9 years instead of 7, but it lines up with the change of century, so you did get something cool to celebrate in the meantime.

So, now we know what years should have an additional Pi Day, the next question arises: when should this additional Pi Day be? We don't have months 14 or 22, so we can't just flip one of the previous Pi Days to MM/DD or DD/MM. 314th day of the year is a cool idea but 314th day counting backwards seems to be really stretching it.

How about using the digits of pi for the number of seconds past since midnight of January 1? Arguably seconds are a more fundamental unit of time than days, and it fits with our overarching theme of achieving higher precision. The only issue here is that depending on how many digits you choose, you get different answers. Picking 314159 (any lower precision and we end up on Jan 1), we get the fourth day of the year, Jan 4. Picking 3141592, we get the 37th day of the year, Feb 6. Picking 31415926, we get the 364th day of the year, Dec 30 (or Dec 29 on leap years). I am inclined to pick Feb 6, mostly because it separates it from the Christmas/New Year holiday season and instead gives us a new date to look forward to.

In conclusion: according to my new proposed system, we would celebrate the same three Pi Days (March 14, July 22, Nov 9/10) on most years, but on years whose last two digits are divisible by 7 (like 2021, coming soon to a calendar near you!), we would also celebrate Feb 6 as a Pi Day. Following this new system would have the following pros and cons:

PROS:

- (more) mathematically accurate average number of Pi Days a year
- more pie a year on average
- winters are now on average slightly less depressing

CONS:

- ???

I think that, after some careful and unbiased consideration, the pros outweigh the cons. Let this article stand as my proposal to MathSoc; let's make this happen, and bring more Pi to the masses!

tendstofortytwo

1. http://davidbau.com/archives/2010/03/14/the_mystery_of_355113.html

THIS mathNEWS ARTICLE IS SPONSORED

I am excited to announce that this **mathNEWS** article is sponsored by the hit 2020 game Carnage of Glory™. Now, I am very excited about this sponsorship because I actually used to play Carnage of Glory™ before they reached out to me. Carnage of Glory™ is an addicting fast-paced RPG with console-level graphics and fun addicting gameplay. Carnage of Glory™ also has a built-in friend system and is great for addicting team play. It is no wonder that Carnage of Glory™ has a 4.5 star rating on both the App Store and Google Play, and over 20 million total downloads. People simply cannot stop raving about Carnage of Glory™, download Carnage of Glory™ yourself to see what all the buzz is about. If you install Carnage of Glory™, be sure to use my creator code, "ez_claphfs" for 30000 gold and 2000 rubies for free when you first install Carnage of Glory™ and a free "rare mystery drop crate" that you will be able to open upon building your first town. This excellent offer is for a limited time only and applies to the first 500 people who use the code, so you will want to get in on this before time is up. You should also be sure to join my Carnage of Glory™ gaming clan, which is "laphfing-my-ass-off". I play Carnage of Glory™ all the time and am super active there. As I said, I was super excited to receive the opportunity to promote Carnage of Glory™, the game that I love.

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Anyways, back to the article.

At number 3 of the "top three geese on campus that I have seen list", we have that big fat goose that sits on the sidewalk in that field outside of M3 that I walk past every time I go to class. He just seems nice.

At number 2, we have the goose with the anklet that sits on the lawn outside my res window. He can be pretty loud at times, but it is reassuring to know he will always be there.

At number 1, topping the list, we have that one goose who hissed at his buddy after his buddy hissed at me. I really appreciate him sticking up for me.

Aphf

> # I think I'm hilarious, but I never end up in mathNEWS, so I musn't be.
>
> PROF. RILEY METZGER

AN ANALYSIS OF "FUCKIN' PERFECT" BY P!NK

I am of the improbable and almost certainly impossible opinion that P!nk, the award winning singer, really wrote all of her songs about the experiences of a student studying math at the University of Waterloo. We shall start by in this installment examining the song "Fuckin' Perfect". In this song, P!nk is writing to a struggling student.

The first line, "Made a wrong turn, once or twice," is really about a Waterloo student trying to navigate PAC, which as everyone knows stands for Poorly Architected Centre. So while we might be lost in PAC I think we are off to a good start.

As any student who's entered Tatham Centre can attest to, the people behind the desks "don't like my jeans, they don't get my hair," which might be because I'm underdressed for this interview, but I did at least wear shoes every time.

Perusing the Waterloo subreddit during midterm season, P!nk would have been inspired by students who mistakenly chose Lazeez, who second guessed whether they belonged in their program, and underestimated the amount of studying required in their past midterm. What else would the line "mistaken, always second guessing, underestimated" be talking about really? But she reminds us that "bad decisions [are] alright" and really there's no point in stewing over bad decisions as "it's a waste of [your] time". She saw how so many of us are "filled with so much hatred" to ourselves and she cautions us to not go "looking for the critics 'cause they're everywhere."

Ultimately the chorus of the song, "You're fuckin' perfect to me," is a reminder to all students that regardless of our grades, our looks or anything else, "don't you ever, ever feel like you're less than fuckin' perfect," although this being said—please shower regularly.

[Editor's note: aww this is so encouraging 🖤]

MFS

EPISODE 12: MULTIDIMENSIONAL DOMAINS
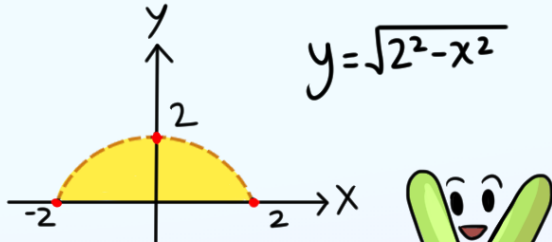
Enjoy episode 12 of the MathSoc Edu-Action! series: *MATH 237 Multidimensional Domains*! If you have any feedback you can contact the project manager Gavin Orok at `mathsoccartoons@gmail.com` or fill out this survey: `https://bit.ly/cartoon_feedback`.

Gavin Orok

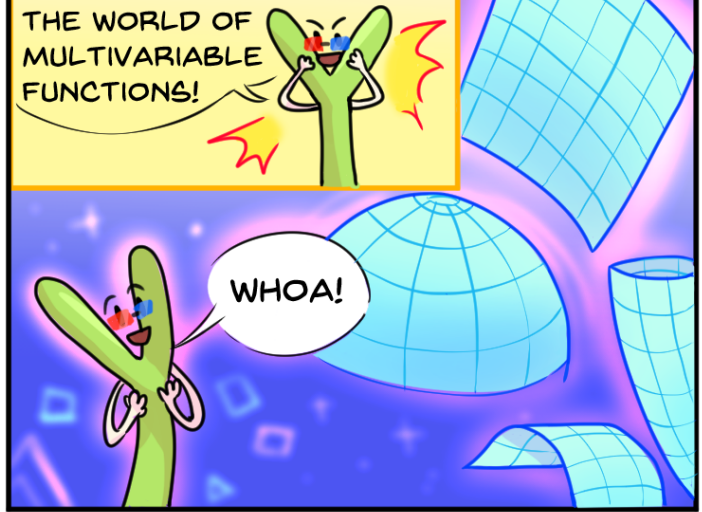## MATH 237 - Multidimensional Domains

Story by Gavin Orok, art by Isabella Scott

You're used to single-variable functions: you put in a real number x from a 1-D domain, and return a unique real number y.

$$y = \sqrt{2^2 - x^2}$$

To graph it, you plot each value of the independent variable x against the value $y = f(x)$ of the dependent variable.

PUT ON YOUR 3D GLASSES: IT'S TIME TO ENTER THE WORLD OF MULTIVARIABLE FUNCTIONS!
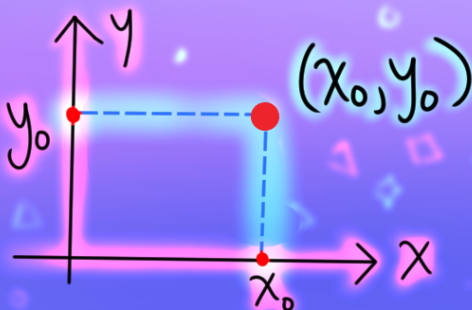
WHOA!

We will consider multivariable functions

$$f : D \to \mathbb{R}$$

where $D \subseteq \mathbb{R}^2$.

The **domain** of a function f is the set of allowed values of the **independent variable**: the set of all (d_1, d_2) so that $f(d_1, d_2)$ is defined.
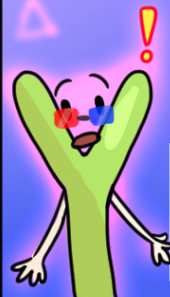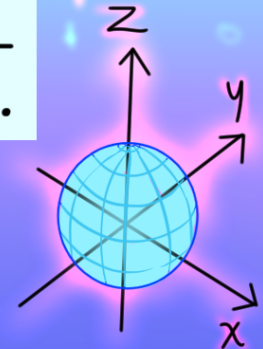
$$f : D \to \mathbb{R}$$

Here, the domain of f is a set of points in the x–y plane: ordered pairs (x_0, y_0).

(x_0, y_0)

The x and y variables are linked in the definition of allowed points, and often influence each other.

For example, consider the multivariable function

$$f(x, y) = \sqrt{2^2 - x^2 - y^2}.$$

Here is the graph, plotting each (x, y) pair in the domain against the z-value $f(x, y)$.

MATHSOC

MEF
Mathematics Endowment Fund

MATH 237 - Multidimensional Domains

Story by Gavin Orok, art by Isabella Scott

DIALECTICS III — ON THAT TRAGIC DAY

CONTINUED FROM LAST ISSUE'S DIALECTICS II.

SATURDAY, MARCH 27, 2021 — AN AFTERNOON PHONE CALL.

Wordress: Ummm… what do you mean? Something, uh, you need to tell me? Something I deserve to know?

Camien: I figured… I think what I have to tell you might change your decision to ask me out.

Wordress: You, uh, said it had to do with the first night we met? In that classroom in MC, like, at that **mathNEWS** production night all those months ago?

Camien: Yup. And I was crying… and you heard me and came in and asked if I was okay… *[Sigh]* I've said this before, but that was so, so kind. Just the thought that someone could still care if I was okay after… what I did.

Wordress: What, uh, *you* did? I… always thought imagined it was someone else who'd passed some grievance on you.

Camien: I'm sorry. This is… difficult for me to talk about. But, I guess, you really *do* deserve to know…

<p align="center">❧</p>

Where do I start? I think it was February or March, last year. Just about a year ago now, before the lockdowns. I can't believe we've been in this pandemic thing for a whole year now, to be honest. It feels like forever, and it feels like yesterday. I'm getting off topic, I guess. I'm stalling. Let me give you some background first…

I was dating Ellesmere at the time. I've told you about Ellesmere, right? Briefly, I think, but I didn't really bring up a former girlfriend too much with you, since, well, I like you *that way, Wordress*. But you deserve to know.

We'd been in a relationship for about a month, and I was head-over-heels for her. I guess I was pretty new to it all, the whole relationship thing. Ellesmere was way more experienced and mature and trusting.

I lived in residence, in Village 1; the East 4 building if you're familiar with that. There's so much drama in the residences. Rumors of who likes who, new couples, broken-up couples, clandestine night-time excursions — there was this one girl in my building who had a huge crush on me. Her name was Anne.

I was absolutely in love with Ellesmere then, and Anne knew it, but she tried anyways, flirting, asking me to do stuff together with her, giving gifts, so on, so forth. I suppose Ellesmere might have known, but she either never found out or didn't care. She trusted me.

I… I never did tell Anne outright that I wasn't interested. I should have. I did things that led her on… I-I've reflected on it quite a bit, and I think I liked the attention. If I had the chance to do it over…

Anyways, I had quite a few insecurities when it came to Ellesmere. She's a music major, and always practicing and performing with other people. I always wondered what she was doing in those practices, whether she was flirting or messing with other guys behind my back. She was just busy with music practice so often! I'd ask her all the time if she wanted to go out with me for the evening, and most of the time Ell' said she had to practice. Late night sessions with dashing musicians in secluded, soundproof practice rooms? Of course I was resentful, Wordress. Of course I was.

I think I've changed since then, learned from my mistakes. I don't think I would feel the same resentment again — sorry, off topic trying to defend myself again; that doesn't have bearing on what actually happened.

Ell' invited me to all of her performances, and I went to a few. Do you go to live performances often, Wordress? When you see a person step up to the stage and start to play — play *well* — something changes about them. They take on this aura of, um, transcendence, like they're infused with some spirit of music. It's *special*. And Ellesmere was usually up there with someone else, usually this guy named Triton, in a beautiful duet. They way they'd play together was magical. They were on the same wavelength, shared a *bond* through the music. And well, you know, Wordress, I've never been very musical at all. Triton shared something with Ellesmere that I never did. I was jealous. I wished that could be me up there on the stage with Ellesmere.

About a week after one of those performances by Ellesmere and Triton I attended, I was sitting in my dorm feeling pretty down. Ell' was off at some Saturday night music society event with her friends, and I didn't have any plans for the evening. It was one of those Saturdays that feels just bursting with adventure and potential — but the person I wanted to be with most was otherwise occupied.

I was moping and trying to scrape together the motivation to start watching a movie or an assignment when Joseph knocked on my room door and came in. I remember the way he looked when he walked in. Eyes down, shoulders hunched. Joseph isn't that type of person. I knew something was wrong.

Joseph said to me: "Camien… Camien, there's something I need to tell you. It's something I wish I didn't have to say. But you deserve to know."

He said, "Camien, Ellesmere's been cheating on you."

It spoke to my lack of trust that I didn't even ask Joseph to repeat it. I was furious. "With who?"

Joseph wouldn't meet my gaze. "With Triton," he said. "I saw them… kissing in the practice room after the performance we went to last week."

What comes next is the bad part, Wordress. Please, uh, please bear with me. I want to try to explain what was boiling up inside me. It wasn't a feeling of sadness, or betrayal, or anything as melancholy as that. I felt, well, vindicated. Like all the irritation at Ellesmere that had been building up could finally be let loose. It was the answer some animal side of me wanted to hear. It was justification for all my anger.

"That bitch," I said to Joseph. He tried to give me a hug, to console me, but I shouted that he should leave. I laid on my small Village 1 cot, turned off the lights, and fumed. I savoured the feeling.

I ended up crying myself to sleep that night. They were tears of sadness, but also of rage. Some part of me must have held onto the wisdom to sleep before any rash decisions.

I awoke to a sunbeam in my eye through the window I forgot to close, and I think that for a bleary moment, I was calm. Then the fury came back before I even remembered what caused it.

I picked up my phone, and sent Ellesmere a message. Something along the lines of "Joseph told me what you and Triton did. I don't deal with cheaters. We're through."

Ellesmere tried desperately to reach me, but I'd blocked her on everything. She was out of town in Toronto that Sunday, and I found out later she cancelled on her event to come back to Waterloo. My don told me after that she'd banged on the door to our building for half an hour until someone let her in, then waited in front of my door sobbing my name for another two before my don kicked her out.

I wasn't in the building that day. I was on a date. With Anne, the girl in the same building who liked me — I think I mentioned her earlier. I wanted revenge on Ellesmere.

I went to Anne that Sunday morning, and told her that I'd broken up with Ellesmere and needed a shoulder to cry on and all that charming sob.

She took me on a long walk through snowy Waterloo park and then to dinner at a nice Thai place uptown. We didn't talk too much, but it was nice to go out. I think Anne was over the moon that day, smiling, laughing at every bit of sad, self-deprecating humor I tried, sympathizing with my anger and sorrow. I used her.

We ended up going back to her room in our building — Ellesmere was gone by then — and watched a movie. What was it…. *Total Recall.* The 2012 remake. We cuddled on her bed, and one thing led to another… and, and… I slept with her that night.

Anne told me Monday morning that the previous day had been the best day of her life. She was high on love. I wasn't.

She asked when we could go out next, and I gave her some non-committal non-answer. After last night, I think my indifference broke her heart. I didn't really care right then.

I went to class like usual. I was numb after the last two days. The lectures went in one ear, and out the other. I went to a late lunch. Got a sandwich from the C&D. I went to my afternoon class in MC, and got a text from Joseph, asking me to meet him in the M3 green.

I got out of class, and walked down the stairs and outside. Joseph was waiting there. Ellesmere was standing next to him, crying, looking like she'd marched him all the way across campus, and glaring at him. And then glaring at me.

Joseph spoke first. He was "Camien… I'm sorry, I lied to you."

We didn't talk for long. I found out several things that day.

One: Joseph was a very envious, devious liar, and was not, in fact, my friend.

Two: Ellesmere and Anne had talked earlier that day, and Ell' knew what I'd done.

And three: She hadn't kissed Triton. Ell' was faithful through and through.

The last thing she said to me was this. She didn't scream, or sob, or stutter. Her voice was as cold as the snow on the ground.

"Camien, I've judged you wrong. You've had not an ounce of trust in me. I don't deal with cheaters either. We're done. Don't talk to me again. And leave Anne alone. You've hurt her enough."

<div style="text-align:center">☙</div>

Camien: I cried, Wordress. I cried and went to my safe place: MC, where you found me. I cried because I am a terrible, terrible person. I hurt her, and I'm so, so sorry for what I did. I… I've regretted it ever since. That's what I needed to tell you. I want you to know what I did, and I want you to know I-I won't ever do it again.

A long silence. Camien holds his breath. He can hear Wordress taking short, sharp inhalations, as if she is about to cry.

Wordress: I… I'm speechless. That's horrible of you, Camien. Poor Ellesmere… and Anne… I, uh, I need some time to think. Good-bye, Camien.

Camien: Wordress —

The click of a phone being replaced in its socket. Camien lowers his own phone and stares unseeingly at the screen. He is not tired, but

he wants to crawl into bed, draw the covers, and sink into oblivion. An unbidden, absurd thought strikes Camien: that perhaps Wordress keeps a landline just for that click.

To be continued…

CC

THE WATERLOO SPACE FORCE

To WUSA, Feridun, and whatever the Canadian version of NASA is called:

For millennia, humans have looked at the stars with wonder, and thought about how much money they could make by mining precious metals from them. In the last century, Yuri Gagarin survived a journey to space and back. This incredible achievement surprised the American people, the scientific community, and especially the Soviet scientists who designed his spacecraft. However, there is one space race competitor that seems to have been forgotten by the world: the University of Waterloo. In fact, Waterloo even had a secret space force in the 1960s that was unfortunately decommissioned due to minor inconveniences such as "the complete lack of any budget" and "the ethical issues of sending astronauts to space in aircrafts built by acid-fuelled first years." Although we were once the world leaders in space innovation, our hubris allowed us to be defeated by under-funded startups such as SpaceX and NASA.

Elon Musk once passed on our great university because he thought there were no girls here. Regardless of how valid his point was, Waterloo can no longer keep quiet while billion-aires with God complexes steal the glory that once belonged to the USSR. WUSA councillors, I beseech you: stop LARPing as corrupt and close-minded Canadian politicians, and start LARPing as corrupt and hyper-aggressive American politicians.

When UofT sends their best and brightest to orbit for the first time, we need to be there and ready to shoot them down on sight! When Mars is terraformed and colonized, we need to be there and ready to populate it with space geese! And when intelligent life is finally discovered, we need to be there at first contact, and ready to sign them up for PD courses!

Therefore, I propose defunding our Arts faculty and investing all our money into becoming a global superpower like Russia, China, and Disney. We must manifest our destiny as Canada's most innovative University™, and show the world that we would rather leave Earth than suffer through another semester of online learning.

In the spirit of why not,

Admiral Spaceship

ALL I WANT FOR CHRISTMAS IS TTC MERCHANDISE

I'm not a greedy man. I don't have much in the way of material wants. I usually tell my family and friends to get me nothing for Christmas, since I don't want them to go through the trouble and I also **legitimately** never actually *want* something.

But this year's different. A few months ago I found out about `https://www.ttcshop.ca`, the online front for the TTC merch store, and lemme tell you this—it has **rocked** *my GODDAMN* **world**. They have lapel pins and cuff links with the subway line numbers on them, an umbrella with the TTC subway map printed on the underside, flash drives in the shape of the Toronto Rocket—I could go on. Maybe my excitement at the existence of *TTC paraphernalia* of all things is kind of going over your head, and that's okay. I don't expect everyone to understand; not all of us can have a misplaced fixation on the TTC and metro systems in general.

While I'm still yelling into the void, I just wanna take a moment to show you my favourite thing from the store. It's the "retro knit jersey", shown below.

IF YOU DON'T THINK THIS SWEATER IS THIS THE SHIT, GO FUCK YOURSELF. *Just take a FUCKING LOOK at that classic burgundy and cream colour scheme! It kind of turns me on.*

The best thing about this sweater is that it's on sale for the low price of $48.75, down from $65.00! I'm tempted to outright buy it myself, but I also know the holiday season is coming up, and the tradition of gift-giving with it. So if you're ever in a generous mood, and want to treat your favourite **mathNEWS** writer with something special… well, you already know what to give 'em. Mail it to the **mathNEWS** office and the editors will take care of it. Please and thanks.

Finchey

AN INTERVIEW WITH BARACK OBAMA

In a clear sign of desperation and flagging book sales, Barack Obama sat down with **mathNEWS** to talk about his new book, *A Promised Land*.

Thank you for sitting down with us, Mr. President. First off, how and why was Donald Trump your fault?

Well, I think the election of Donald Trump was really a symptom of the degradation of our collective body politic, and I don't think it can be blamed on any one person.

I don't know. When you were President, Donald Trump wasn't, and then you weren't President and Donald Trump was. Seems pretty clearcut to me.

I think you're ignoring some parts of the historical record. That being said, like any good President should, I think, I am constantly looking back and wondering what I could have done better. It's clear you can draw some lines from our handling of the recession to the discontent that led Donald Trump to power.

Let's focus on that. During the recession, how many more banks do you think you should have bailed out?

That was a tough decision. On one hand, the American people were suffering, but on the other, the economy was headed for imminent collapse. Like the Federal Reserve Chair said, we might not have had an economy if we didn't do what we did.

So is that more or less?

I think we did the best we could.

Alright, lightning round, you or Abraham Lincoln, greatest President?

I don't think that kind of framing is helpful. Each president has their own set of circumstances and personal beliefs they bring to the job, and I don't think it's right to rank them so explicitly.

You didn't answer the question.

Part of the point of this book is to add some nuance to the decisions I made, and I don't think this helps—

Come on, you coward, pick something.

Fine, Lincoln. He did free the slaves.

What do you think went so wrong with your presidency, since you clearly think you've fallen short compared to past presidents?

Can we talk about Obamacare now?

Let's talk about America today. Is America doomed, yes or no?

I know times look tough. I know that the progress we might have made under my administration looks like its being rolled back. But, I still believe that we can make a more perfect union, and that Americans are fundamentally good.

Really?

No, of course not.

UW Unprint

THE BURN-OUT RAP

Years ago I'd only hope I'd go to school and work online

Now tragically I miss MC more than I miss some friends of mine

And now my job consists of only copying code from Medium

I'm so hooked up on social media I got Linkedin Premium

Haven't left the house in one hundred and fucking eighty days

So deprived and lonely, my God I've ran out of animes

Imitation ain't a game that's only made for Turing

Got Among Us in my brain, imposter syndrome's what it's doing

I miss Lazeez so much I made shawarma on my own

But it caused a small inferno and then almost burnt my home

Then I tried to cook my own home-made garlic mayo sauce

And another kitchen fire really showed me who's the boss

Next I tried to make some coffee, I just needed the caffeine

But my kettle burst on fire like I poured in gasoline

So it turns out the burn out rap was not about my mood

But it's about my failed attempts to cook some basic food

El-φ

MY FRIEND ASKED TO BORROW MY STUFF AND I ALMOST SAID NO

"Hey, can I borrow yours?"

I look up to see my friend innocuously reaching for my stuff. Presumptively. It's a harmless request; a simple favor. I have absolutely no reason to refuse. It's silly even to hesitate. But for a moment, I do. As I shift my gaze between my friend's hand and my things, it suddenly dawns on me:

What if I am a fundamentally selfish person?

I mean, I have a brother, but being a younger sibling I always got my way. Maybe this is the worst kind of spoiled — my whole life, reaping benefits from others' selflessness without even realizing it. My friend senses that the atmosphere had changed. Their eyes, inquiring, are no more offended as they are delicately curious.

"Hey, can I borrow it?"

Still no answer. My lips are accidentally frozen. And I want to say "Yes! Yes of course, sorry my mind just blanked!" but my thoughts take the left fork and occupies itself contemplating; what would happen? What would happen if I were to say no? Is that socially acceptable? Am I expected to follow social conventions around people I am close to, sitting here with them in my own home, having welcomed them into my chambers and let them sit in my sacred space? Is it better to be unequivocally honest? Or do I submit to the unintended peer pressure of my friend's want of that which originally belonged to me?

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

"Sorry, I've just never let anyone touch this before…" was all I managed.

Wrong move. Their expression shifts into an uncomfortable grin. The air fills with electricity as I fail to express the ambivalence of needing to retain control over my belongings while satisfying the hunter-gatherer tribal instinct of pleasing my companions. Confused, they try laughing it off, lightening the energy. I laugh along — but removing the gravitas of this request only serves to increase my dilemma. Now if I say yes, I am making my friend into a manipulator, a character of dominating presence leeching off their friends; yet if I were to say no, I become a bogart, incapable of sharing my monopoly.

"Really?" they ask, incredulous, "Not even your parents?"

I shake my head, hopeful that they'll take pity and take the burden of this situation from me by recalling their figurative and literal palm. But they persist. They need to borrow my stuff. Except they don't. My chest fills with anger, and I want to spit back that if they had packed their own stuff, if they had *planned this through*, if they hadn't overstepped and muscled their way into my hospitality, then maybe our friendship wouldn't be threatened at this moment.

But I am taken aback. This is so simple. I am capable of letting someone borrow my stuff. And why shouldn't I be? I'm not using it right now. This is a mere common courtesy. And the longer I stretch this, the more awkward it gets before the inevitable resolution I know I must take.

"Yeah sure, of course. Sorry," I mutter, getting back to my work. Simple, straightforward, uncomplicated. They take it and resume their own business as well. The moment has passed. But the tension is still there. I try to convince myself that I made the right choice: that social decorum is a priority over personal comfort. As they leave, I feel pride at having controlled my emotions. But I still feel doubt sinking in. And anyway now my toothbrush tastes kinda weird. I guess it's okay, and I should just move on with my life.

A cool pen name

TWO COVID-19 VACCINES HAVE OVER 90% EFFICACY IN PRELIMINARY RESULTS!

YAY! There is light at the end of this dark tunnel. :)
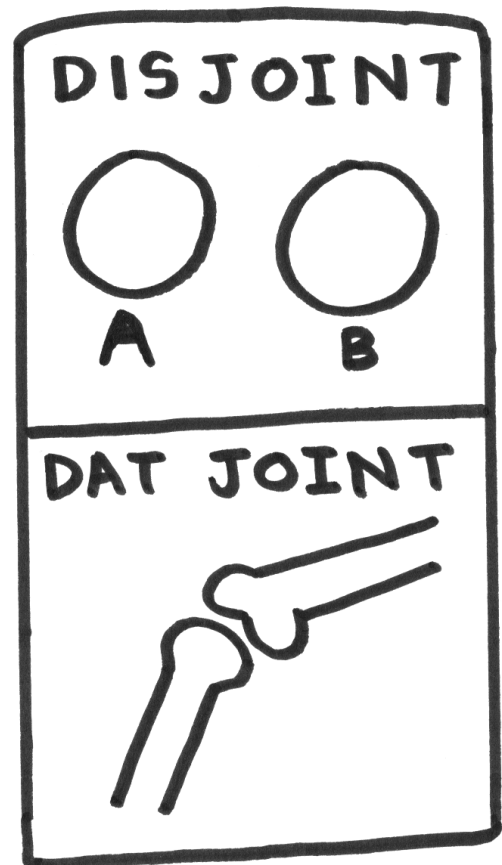
Abald Man

N REASONS THE MATH CND SHOULD DO ONLINE FOOD DELIVERY

- I miss CnD food.
- I also miss how cheap CnD food is.
- The extra money would help keep prices low, ensuring my business doesn't go to iNews or the Science CnD or even…*shudders*…the Engineering CnD.
- This decision would give the CnD the title of being the first on-campus establishment to offer delivery.
- Other CnDs would be unable to compete and would go under, allowing Math to get a monopoly on campus CnDs.
- This is a groundbreaking idea.
- It's even better than adding a bar to CnD.
- It's even better than adding a bar that serves on-demand garlic cheesesticks, which is clearly superior to a bar that serves on-demand drinks.
- The cash flow can be used to fund plans for the Math faculty to annex the Engineering buildings.
- Post-annexation, the added space can be converted into more CnDs, allowing for exponential growth in market share.
- Rapid growth in market share begets rapid growth in income, which could fund even more annexations.
- Eventually, the Math faculty would become the most powerful organization in Canada, rivaling even the federal government.
- This power allows the faculty to sidestep CRA audits, ensuring continued, unchecked growth.
- The Math faculty is declared the *de facto* government of Canada. Its first Act of Parliament is to enact a new law banning Canadians from eating anything other than CnD garlic cheesesticks. Mild protests ensue, but the rapid distribution of garlic cheesesticks turns them into celebratory gatherings.
- Lured by garlic cheesesticks, the Queen decides to resettle in Canada. The United Kingdom is unhappy and declares war, only to find that its entire armed forces have switched allegiance too after being exposed to garlic cheesesticks. Faced with no other choice, the UK decides to become a part of Canada.
- Canada continues to grow in power. Reverse brain drain occurs as people flock to our borders, desperate for garlic cheesesticks. Numerous countries, alarmed by the sharp rise in emigration, limit the ability of their citizens to travel to Canada and claim garlic cheesestick asylum.
- These actions lead to riots and political instability, often ending in coups, which are then followed by referendums on allowing voluntary annexation by Canada. The referendums pass with over 90% approval. Those who disapprove are fed garlic cheesesticks until they approve.
- By the year 2050, every single country has been annexed into the Dominion of Canada. World peace is established, fueled by a constant, unending diet of garlic cheesesticks. We have entered a garlic cheesestick utopia. There is no war, or conflict, or even disagreement; only garlic cheesesticks. Together, we live by the cheesestick, and die by the cheesestick. The garlic cheesestick unites us all.
- Did I mention I miss CnD food?

quantum goose

AN OFFERING TO PI

clarifiED

WHAT THE HECK IS UP WITH LINEAR TIME?

gridCOMMENT *144.5*

Hey all! There's only about two weeks left in the term, which is a concept I'm having trouble grasping. It feels as though this term has passed in no time at all, despite the way some weeks seemed to drag on. I'm looking forward to the end of classes, and trying not to think too much about exams.

An exciting thing happened this week; I received two whole crossword submissions! I haven't felt this overjoyed in months. Both submissions were completely correct, and their answers to last issue's **gridQUESTION**, "Which UW building is most likely to be haunted?" were as follows:

- NitricAcid: "Grad House. It used to be an old farmhouse, so odds are at least one old farmer died cranky and haunts the place."
- Aeschylus: "PAS is haunted by the dead first years who lost their way in its labyrinth walls. Plus, if you ever go down to the basement, you might hear the screams of past psychology experiment subjects."

I like the idea of cranky farmer ghosts, so congratulations to NitricAcid for winning the one true glory: bragging rights. Both answers seem like good enough justifications to me so I officially deem both Grad House and PAS to be haunted (no need to actually check for ghosts).

This week's crossword theme is "Math in the Great Outdoors". I had this idea when I came up with a few puns a while ago. The original plan was to make a regular crossword, but then I realised that making regular crossword grids is hard. A few of these may be a little tricky. The **gridQUESTION** for this issue is "What's something we can still look forward to, despite the pandemic?".

Remember to email your **gridWORD** solution attempts to mathnews@gmail.com with your name or a moniker, and your answer to this issue's **gridQUESTION**.

Cloak and Vorpal Dagger

ACROSS

1. Genuine common set of numbers (4)
3. A cab uses strange calculating tools (8)
10. Soundly exist as a pollinator (3)
11. Mother's sister screams at an insect (3)
12. A branch of mathematics uses tree by genome, lacking nothing (9)
13. Whole mall has no milk, to start (3)
14. Bound to start just ref (4)
18. Consume a mathematical constant, then mix up tea and a pastry, say (3,1,2)
20. Sad colour (4)
21. Fragments of myrrh in our horned plant-eater (5)
22. Depend on a broken lyre (4)
23. Least iron west (6)
25. Listen to notice about wave (4)
28. Travel over snow is essentially riskier (3)
29. Area under a curved lawn is in the grass without hope (9)
31. Unending youth, but not at home (3)
32. Density is declared as oar propels a boat (3)
33. Rated Latin day in light emitted (8)
34. Counterfeit cake replaces cream with feta (4)

DOWN

1. Span of a pasture (5)
2. Perfectly ably held solute (10)
4. Support a furry mammal (4)
5. A three-dimensional shape to the power of three (4)
6. Turn meats into vapor (5)
7. To finish, release a large emblem (4)
8. Disastrously let client show intelligence (9)
9. Balance smashing venue with partying first (4,2)
15. University, short on joining (5)
16. Teacher profile to start (4)
17. The space occupied by the manipulation of symbols is, strangely, a regal bear (10)
18. In a pickle; more wrath from burrowing invertebrate (9)
19. Dirt without ends is a flower (4)
24. Bring up a mine containing gold and a puzzle (6)
26. I read, unusually ventilated (5)
27. Employment age goes by us (5)
28. Messy arts form luminous point (4)
29. An extremely small Greek letter (4)
30. Wood source on a street with no ends (4)

lookAHEAD

AHHHHHHHHHHHHHHH HHHHHHHHHHHHHHHHHH HHHHHHHHHHHHHHHHHH HHHHHHHHHHHHHHHHHH HHHHHHHHHHHHHHHHHH HHHHHHJCX93I U64

hsakjdhslkjf sahfdlkjsasa hdlkjsaoidlusa hduwq hoiudsqcd hsdahclkjhkjhdskfLKHSD YAHDLKASDLSALIJDA BWOIDHSALI HWAIUD HASJD H:LKSAJBDLKJHDIJLKoidsafrlkjpoc bfjpobcxusaDboisadjfdsaj af hd foiwibLKDS HjwiuehfdspiuhsapiudHSAIUD HPEHFIU hwaiud H belihdlkjLKJE hrlkjehkj HLKJDS hkjeshfKJEAH kh h666ksaudhkuSAhdkwahkuwd6676sdnmasd;lksandL SIX SIX SIX oi3yu oisa

mathNEWS *Lead US Political Correspondent*

LAST ISSUE'S gridSOLUTION

otherNEWS is made technically possible by club executives of the Math Faculty.

I say "technically" because if they had sent us more news this week, this box wouldn't be here.

THE mathNEWS EDITOR WHO PUTS THE "NEWS" IN mathNEWS