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mastHEAD

"THERE'S A LOT OF PROSPECTIVE EDITORS THIS TERM. HOW SHOULD WE ~~HAZE~~ WELCOME THEM?"

Sup y'all, guess who's back!

Well, you don't really need to guess, because 1. you're reading this issue right now and 2. my name is at the bottom of this **mastHEAD**. But regardless, it's good to be back in MC 3030, doing the lord's work producing a new and improved term of **mathNEWS** issues.

Production night this week was wild, with *over thirty* people showing up! I swear we haven't had a turnout this big in ages, at least not while I've been editor. Lots of quality content was produced, including and not limited to:

- An interview with me, your favourite editor!, with accompanying caricature of me at production night
- A guide on surviving back-to-school
- Friendly dialogue between students from the MATH and GBDA faculties
- A beautiful sketch of some mountain highlands
- A helpful review of content covered in MATH 135, with a twist
- American politics
- **horrorSCOPES**, dril version

Isn't that a nice lineup?

However, I must comment on the article on the page immediately opposite this one. I was accosted by two frightful beings on production night and interrogated at knifepoint. All of the answers I gave were under duress, and by no means should you base your judgement of my personal character upon them. Also, if **mathNEWS** writers actually want to unionize, I fully support it and would like to help however possible. This is assuming that the issues the contributors have are with things that could be solved with more funding and not with the editors themselves. If you have an issue with who we are as people, please find someone to volunteer as the HR department of **mathNEWS**, and then take it up with them.

Well, that's all for this issue! I hope you all enjoy reading the articles and other content featured in this issue, and we'll see you again in two weeks!

itorED
Editor, **mathNEWS**

Beyond Meta	Lead them into a traditional game of mao.
dawdling	Lock them in the **mathNEWS** office for a day to give them a taste of the authentic experience.
transitivity	Send them home with boxes of old issues for "research purposes."
Anon	Let them decide how many pizzas to order??
water	Make them clean the **mathNEWS** office.
Sandwich Expert	Make them eat a double anchovy pizza, with a gluten free crust.
jeff	An actual, no-holds-barred battle royale in the **mathNEWS** office. Last one standing wins the keys.
πllow Princess	Gently.
Whild	Run a typing contest, whoever can type the longest (in hours) gets to be an editor.
Sillycone	Pretend to kidnap them when they're walking around MC.
Epsilon Screwn	With parody articles, as the Killer Tomatoes, and for terrifiED
?	Smash tournament.
waldo@<3.LE-GASP.ca	With lots of offers to help and a friendly smile.
pikachu.exe	Just make all of them editors and see who destroys the office the least. Then fire (?) those that destroyed it the least.
Herbie	Lock them in the **mathNEWS** office until they've come up with a way to overrun the Math faculty so **mathNEWS** can get a bigger office.
Hœ chi minh	Make them listen to crazy frog for 2 hours on repeat until they lose any sense of sanity.
Xx_420SonicFan69_xX	With warm pies, warmer sweaters, and taking all that away on an ice cold hockey rink.
George Lambrou	Give them to **me**.
itorED	Force them to watch other editors do layout for hours on end without the chance to contribute.
swindlED	With a free gift of several (hundred) copies of **mathNEWS**.
confusED	Learn cuneiform.
terrifiED	Force them to clean up our *totally not messy* office.

ARTICLE OF THE ISSUE

This week's article of the issue goes to instantpoodles' A MATH 135 Review (and Porn). Visit us in MC 3030 to pick up your prize.

swindlED
Editor, **mathNEWS**

I support the unionization of the mathNEWS writers.

MIN ZHU, mathNEWS EDITOR FOR WINTER 2020
ALONG WITH JAMIE ANDERSON, TERRY CHEN, ANUJ OPAL

THE HUMAN COST OF mathNEWS

editorASKS *142.1* (mathASKS *WILL RETURN NEXT ISSUE, WE SWEAR!)*

On a sunny, idyllic Sunday, itorED sat on my comfiest couch, brought the cup of tea to their lips as they glanced carelessly out the window, and said something that is entirely consistent with their gremlin self.

"The **mathNEWS** writers are all just bodies for me," they confessed. "They are machines into which I feed pizza so that articles come out, but that in the opposite order. I have no emotional attachment to any of them, and care for them only for their capacity to fuel my news engine."

My tea party immediately exploded into chaos. Some of the attendees, being learned people of culture who have read (twitter arguments that slightly approximate) Kantian philosophy, believed that there is no reason to ever treat a person as a means to an end. As such, they called for their immediate expulsion.

But others saw further. They thought that Chidi from The Good Place was just such a blowhard, you know? *[itorED's note: having never seen The Good Place, I do not understand this reference.]* They called for us to believe in higher purposes, that may sometimes require the strong to overpower the wills of the weak, obviously only for good reasons tho haha. As our resident pure math major explained, "in fact, this conception of pro-utilitarian coercion isn't diametrically opposed to Kant's conception of morality, since…"

Well, gentle reader, unfortunately I cannot tell you his explanation, because we had all fallen fast asleep.

Nevertheless, a small contingent of the tea party resolved to go to production night, to investigate this further. What follows is a verbatim interview with itorED.

ARTIST'S DEPICTION OF THE FABLED ITORED.

SO HOW LONG HAVE YOU BEEN A mathNEWS EDITOR?

I have been an editor since W17, when I was but a lowly 2B student. This is my fifth term serving as editor. I'm currently the oldest editor. I've been editor for longest, and I am also the oldest.

WHAT'S YOUR GENERAL PHILOSOPHY WHEN IT COMES TO TENDING THE FIELDS OF mathNEWS?

I give the writers the pizza, the writers give us the content, and the editors slap everything together, and the readers find us sometimes.

HOW DO YOU SEE THE mathNEWS WRITERS?

I see them as young buds waiting to sprout under the guidance of good **mathNEWS** editors who will tell them the right things to do.

WHAT'S THE WORST THING YOU'VE EVER DONE TO A mathNEWS WRITER IN ORDER TO GET THEM TO PRODUCE WRITING?

I don't think I've done anything particularly bad other than shout at them from across the hallway and force them into a crowded room full of other **mathNEWS** contributors who then gazed at them like hungry lions about to feed on the young. Actually, I'm not sure if the one who I dragged in today is still here.

Also one time some guy kept taking like, a lot of pizza. We usually do calls for first slice, second slice, and third slice, and then we would do whatever is left, right? But this person would consistently take like whole pizzas when we called whatever's left and so I had to start calling fourth slice and fifth slice.

I don't think this was a bad thing for me to do.

WHY DO THE PIZZAS ALWAYS COME SO LATE?

If they came at an earlier, more reasonable time, they would disrupt the writing process, and we would get poorer quality writing as a result. As you know, writers are only as good as their work, so we want to avoid this as much as possible. *[itorED's note: I don't remember saying this...]*

ARE THERE ANY SPECIFIC ATROCITIES YOU HAVE IN MIND FOR THE FUTURE, OR ANYTHING YOU'D LIKE TO DO TO THE mathNEWS TEAM THAT YOU HAVE NOT DONE YET?

I would like to radicalize them to become communists which I'm planning on doing by recycling my old communist posters but photoshopping **mathNEWS** on all the little red books and information about production night.

ON THAT NOTE, WHAT DO YOU HAVE TO SAY TO THE ALLEGATIONS THAT YOUR ECONOMIC EXPLOITATION OF mathNEWS WRITERS IS TAINTING mathNEWS' COMMUNIST REPUTATION?

I will ask them to speak to my lawyer. Also, **mathNEWS** is not capitalist, we are a not-for-profit; we run at pretty much no surplus whatsoever and also we pay for very expensive pizzas for our writers.

WE'VE ALSO HEARD RUMORS OF A SMALL, DESTITUTE, BUT DETERMINED GROUP OF mathNEWS WRITERS THREATENING TO UNIONIZE IN RESPONSE TO YOUR ACTIONS, WHAT DO YOU HAVE TO SAY TO THEM?

I don't think they exist. If you're in this union, please stand up right now.

OH. UH, THE UNION DOES NOT RESPOND.

Other things to say to them which are um, if you want more money don't ask for it from **mathNEWS**, ask for it from Mathsoc because that's where we get our funds and they give us our funds based on what people want and us editors are not enough people to actually convince them, so you'll actually need to probably write up a petition with your list of demands, get a bunch of signatures and then we can present it for you to Mathsoc.

OKAY, WHAT ARE THE mathNEWS EDITORS TO YOU?

They are my fellow friends and hardworking people who do all the work that I do not do, which is a lot of work because I don't do that much work besides sitting in the office and telling people what to do.

DO YOU SEE FELLOW EDITORS THE SAME WAY THAT YOU SEE THE WRITERS?

No, because my fellow editors, I believe, have to have a full understanding of what **mathNEWS** is, whereas oftentimes the writers are shitposting only. The editors have to actually do things like finances which are a terrible pain and no writer in their right mind would ever want to do that.

HOW ARE YOU TRAINING YOUR mathNEWS EDITORS TO SUCCEED YOU, SPECIFICALLY WITH REGARDS TO WHIPPING THE mathNEWS WRITERS INTO SHAPE?

Oh I think that the main thing is that right now I'm the one who does the most shouting so none of the future **mathNEWS** editors will do as much shouting which means they will be nicer to the **mathNEWS** writers.

DOES THIS SADDEN YOU?

I feel sad only about my leaving **mathNEWS**, but I think it is fine for the writers to get a little reprieve every now and then and for the future editors to hopefully not be so harsh as to be sued by Imprint every six years, okay?

WHY IS IT THAT YOU ARE SO MEAN?

That is a very good question. I think it's a lot of fun. I'm not mean to people who I know and like, like my friends, but it's easier to be mean to a room of **mathNEWS** writers who all see me as their supreme leader type person.

WHO HURT YOU?

A lot of people. I don't think I want to get into childhood trauma right now, you know? But also, the **mathNEWS** writers.

ARE THERE ANY LAST WORDS THAT YOU WANT TO SAY?

I will say that once this article is submitted the **mathNEWS** editors can change anything about it before we publish it, so you know, there are no guarantees that the way it's written in this article is actually the way it will be published.

The Tea Party Contingent

[Editor's note: a member of the union has infiltrated the mathNEWS editor team to ensure this article remains uncensored.]
[itorED's note: if you have any issues with the contents of this interview, come physically fight me in the **mathNEWS** *office at 6:30pm every second Monday. Or send me an email at* mathnews@gmail.com*.]*

PROGRAMMING IS HARD

For some reason I have always been fascinated by how I think about what I do much more than that which I do. That's probably one reason for why I haven't completed any sort of extracurricular programming project in the eleven years I've been programming.

Another reason is that programming is hard. At this point, any math/CS student would have taken a term of CS and done some programming, and would likely agree: programming is hard. My coworkers from my previous co-op placement would agree: programming is hard. They thought up lots of ways to try to make programming easier, and I think they're still trying to figure it out. The entire discipline of object-oriented programming is about trying to modularize and encapsulate complexity, which oftentimes ends up creating premature or unreasonable abstractions which hide the stuff that actually makes any sense.

Programming is hard. Why is programming hard?

Because code gets complicated; because everything needs to work with everything else; because people are lazy and take shortcuts; because old code needs to be relearned; because everything needs to be precisely exact; because things aren't working why is it not working!!!!

There's a common thread to all of these complaints which took me eleven years and one Psych course to figure out: there's too much to keep track of.

Code gets complicated, so it gets harder to keep track of things. Everything needs to work together, so we need to keep track of things. People take shortcuts, so it gets hard to keep track of things. Old code needs to be relearned, so that we can keep track of it. Everything needs to be precisely exact, so we need to keep track of it. We don't know why things aren't working because we failed to keep track of everything.

I think that explanation should be backed by scientific literature whenever possible, though I do think that an argument based solely on scientific literature is a lazy appeal to authority. In this case, there's a lot of psychological literature that, if you put together the right way, can explain why keeping track of too many things, and thus programming, is hard.

In 1956 George Miller published his legendary *The Magical Number Seven, Plus or Minus Two*, in which he described and proposed a theory to model two experiments that attempted to quantify the capacity of working memory, one of the first such attempts to concretely quantify ideas in psychology. In the first, participants were given a sequence of signals and were asked to push the corresponding button as they were presented; in the second, participants were asked to remember and repeat to the experimenter a list of things.

The distinct signals in the first experiment and "things" in the second were of any type — digits, letters, syllables, words — and no matter the type, accuracy was near perfect until five or six, about 50% at seven, and tanked heavily thereafter. From these results, Miller made two observations: the unit of information in human thought is not anything like the *bit* (or the limit would probably change across types of data) and more some sort of *chunk* of basic meaningful information; and working memory holds something like seven of them.

From this famous paper we get our first hint: we can keep track of seven-or-so basic ideas. If we need to keep track of more, then we need to group together more ideas and learn more, bigger chunks.

Three years later in 1959, Lloyd and Margaret Peterson published a result about the *decay time* of working memory: when we don't use or "rehearse" a thought for twenty seconds, it fades away. This is a very familiar issue for programmers: when we realize we missed something somewhere else, or even when we dive into the depths of a complicated part of a program, if we take just a little too long we forget what we were working on before.

Similarly in the vein of forgetting, Hermann Ebbinghaus modelled the forgetting curve in the 1880s, which describes how long-term memory decays. We forget 60% what we've learned from rote memorization in a day. The chunks we create while programming are a lot more meaningful, but even if we only forget 10% of them when we go to sleep we're forgetting a lot of chunks.

Once we've forgotten enough of the thought process, we have to trace our thoughts from before to remember them all. That takes time, and if it's imperfect (which it probably will be), then we're finding ourselves interpreting code contrary to how we wrote the earlier. Compound this many times over with revisions and contributions over months, and it's pretty clear how the task starts to become intractable.

What's worse is that the common ways to try to make things better are oft misguided, fixing symptoms rather than the true cause, and usually end up making things worse. Standards for style (*especially* casing and naming) make things look neater, but strip away everything but the semantics away from the code, leaving identifiers of different types looking exactly the same. Most documentation comes out either not much more clear than the actual code or vague enough that one would need to look at the code anyways to figure out what's going on.

There's a reason we get paid so much for typing away at a keyboard: it's hard to know what to type and where to type it.

dawdling

ON THE SEXUALITY OF THE GOOD PLACE'S ELEANOR SHELLSTROP

Over the holiday break, I spent some quality time with my mother (and other family and friends) in the far off land of St. John's. Amidst the day's activities, we found time to relax in the evening and watch a show that's been on my mental checklist for a long time: The Good Place. We both thoroughly enjoyed its humour and thoughtful morality lessons, and can't wait for the next season. Later, however, upon discussion of LGBT representation in the media, I pointed out that Eleanor Shellstrop, the show's heroine, was bisexual (or some form of being sexually attracted to not exclusively one gender), or at least that's how I perceived her to be written. She disagreed, and insisted that I misinterpreted the scenes I cited as evidence as more of an aesthetic appreciation that Eleanor had. So, consider this an open and semi-formal rebuttal to my mother, and why such discrepancies can emerge in the first place! I will first cite evidence for her more heterosexual attractions, and then the homosexual side. I'll also try to keep things vague so as to be spoiler-free.

Her heterosexual attraction is primarily represented through the form of her main love interest throughout the series: a moral philosophy professor named Chidi. Due to shenanigans within the show, we see them fall in love time and time again. Eleanor, established in the show as a woman, being attracted to and falling in love with Chidi, established as a man, is pretty heterosexual in my opinion. Even still, there are other instances, such as inquiring about past male crushes, or being attracted to other people.

Her homosexual attraction is a little more subtle, so it can be easy to miss. She constantly comments on Tahani, another female protagonist, primarily in that Eleanor finds many physical features of Tahani attractive. Of course, this could be a form of pining, but also could be aesthetics, or envy (as Eleanor, in the show, is established as self-centred). However, in season 3, what became insinuated became much clearer, as one crush Eleanor inquired about was a woman, and furthermore, in a fabricated scenario, Eleanor makes advances on a female secondary character, much to the behest of her friends.

So, concrete evidence that she swings both ways, right? Well, my mother admittedly, said that she must've missed some hints, but to give her the benefit of the doubt, let's say that she was just listing off names of people she suspected had feelings for her, rather than those she was actively attracted to, and that she was simply leaning in for conversational purposes and was just making friendly chatter in what I considered a flirtatious scene. What now, then? I guess we turn to what the director's or actor's intentions were.

Kristen Bell, the actress behind Eleanor Shellstrop in The Good Place (in addition to also having considerable influence over the show), has stated that she intended Eleanor to be bisexual. My source for this claim is a 10 second google search followed by clicking on a news article and skimming it, so take that as you will (though admittedly, it gets a lot of hits on google news article-wise). She also makes it clear that no one on the show cares; everyone knows but it's just not the focus of the plot so it's defined in what Eleanor says and does sometimes but not explored deeply. So this lays the debate to rest, right? Eleanor is bisexual (and explicitly bisexual, as specified by Kristen Bell)?

Well, we can't take an author's word as final authority at the same time. Much of the depth of literature analysis arises from what the analyst sees in the work (and its context), and how that may reflect a deeper meaning whether or not one was intended. The author's intentions may run partly or completely counter to how the work is perceived by a general viewing audience, or under scrutiny. So, I guess that, while there's compelling evidence that Eleanor is written to be bisexual, and intended to be, it can be argued that, unless it's said on show record explicitly, that her sexuality remains uncertain. That being said, I do see all of this as a compelling argument in favour of her being bisexual.

So why does confusion arise in the first place? Well, of course, you can have an appreciative or aesthetic attraction to the same gender without feeling romantic or sexual feelings, so some characters expressing fondness for the same gender or same gender individuals can be read in this light. A more pessimistic view might argue that, as LGBT figures don't get as much media representation, when it's implied but not stated that someone is a sexual, romantic, or gender minority, their comments of affection can be dismissed as strong friendships, or expressions to fly under the radar like “confirmed bachelor” fly way lower than expected. Couple this with gender and sexuality as identities being only recently documented, and often allusions are glossed over. At the same time, it can be difficult to make things explicit without making it seem like gender and sexuality is a focal point, and thus the literature is pushing forward the minority for brownie points with that community, or to push an agenda.

I say that there's no one right way to write an LGBT character, as either people won't see it, people will consider it a media takeover, or both at once. That being said, I'd argue that there's a time and place for everything. Maybe don't have your character openly express their feelings at the funeral of a major character death. That being said, don't give the character one impossibly subtle throwaway line. There's a balance, and that balance varies from show to show, plot to plot, and scene to scene. Eleanor is well-written for her show, because the focus is the character interaction and the exploration of ethics and moral philosophy. Characters themselves undergo development, but only from where they start, and since Eleanor's starting point is that she's bisexual, there's no need to acknowledge it beyond more than a starting point. Contrast this with other shows, like Brooklyn 99's Raymond Holt, where his sexuality presented a point of contention throughout his police career, and garnered publicity in the

show's fictional universe as the first openly gay police captain. Thus, it'll clearly be more present in the show, and become the focal point of some episodes, but won't be the primary focal point (or even mentioned at all) in others. Similarly, sexuality is a part of Holt's characterization, but not all of it.

So, I guess the real answer is that every character is whatever you want them to be, as long as you believe it to be that way. That being said, be prepared when others disagree with you on what the characterization of a character is, and be willing to back up your claims with evidence!

Xx_420SonicFan69_xX

GBDA STUDENT ANSWERS MATH QUESTIONS

Q: WHAT DOES $e^{i\pi}$ EQUAL?

A: Well if i pi would be equal to a simple sentence, i indeed eat pi. Like I eat pie. Then $e^{i\pi}$ ***a*** limit is, but what your limits are.

Q: WHAT IS AN ISOMORPHISM?

A: There is a lot of discourse in the scientific community about what qualifies as morphism. Some say any form of transmogrification or shape-shifting, even just a wardrobe change, could be a human morphism. Isomorphism on the other hand, is specifically defined as a morphism in which one is alone. Hence the combination of isolation and morphism. No matter what category of polymorph we're discussing, if it's alone, has no friends, has no family, or any decent purpose, it is an isomorph, and we can laugh at it, and that's why it's a math term.

Whild

I'M SNEEZING ON MT. FUJI

I'm not feeling well

my icey river nose blocked.

Sneeze! **mathNEWS** *haiku*

Octopodes

I HAVE A JOB!

Beyond Meta

MATH STUDENTS ANSWER GBDA QUESTIONS

Q: WHAT IS A STAMP TOOL?

A1: That seems pretty straightforwards. It's kind of like… button maker, you know how you push the thing down and it pushes your button together? But instead of pushing your button together, you can take various stamp templates and attach them to, like, the bottom. And then you put paper underneath, and you pull down a lever, to make the stamp. Push down, like the button maker. And then your paper is stamped! Hooray! (pause) It now occurs to me that you're probably talking about the stamp tool on Photoshop.

Q: WHAT IS USER-CENTERED DESIGN?

A1: A User-Centered design is a design where you have to think about what the user wants, needs, and hopes for, and create a design which is based around those things that the user wants so that they will be happier when they use it, and will be more likely to remain a user.

A2: It's when the user stands in the middle, and there's like a 360 table of buttons.

A3: User-centred design is the principle that the user experience should be designed around how the user interacts with the software.

Q: WHAT IS A MONOGRAM AND WHEN DO YOU USE ONE?

A1: A monogram, like Major Monogram from Phineas and Ferb, is a customized piece of writing that you put on a product. This monogram only consists of single letter words, hence the part 'mono', thus, monograms are often acronyms as opposed to actual sentences.

A3: A Monogram is like when bougie people get their initials put on face towels, and that's called a monogram towel.

Q: WHAT IS AN EXPERIENCE MAP?

A1: An experience map is a graph where the main nodes each represent large experiences in someone's lives, like parent nodes in my experience tree, and their children nodes are more detailed elements of that experience. As the graph expands, the nodes become even more smaller, specific experiences, so that once you look back, you can see this beautiful map of all of your experiences.

A3: An experience map is a diagram that charts out the entire user flow throughout their use of the application, so it shows what they do, all the options that they have at each step of the start to finish of an application.

Demo

LISTEN HERE PUNK, KEN WOULD RUIN JAO

Recently, I've been made aware of a certain article written last issue: a firm refutation of my own article, wherein I argued Professor Kenneth Ralph Davidson's certain supremacy in a theoretical battle between him and professor David Jao. This refutation was written by a self-proclaimed "supermagictes-seract", and this article will be directed towards them.

Never before have I had the displeasure of reading such a series of ill-informed arguments. Firstly, about the isogenies: the mere claim that Jao has shown you "like 9 of them" speaks enough to the sheer implausibility and ignorance of your argument. If Jao did, indeed, possess any supersingular isogenies (which is unlikely, might I add), I am absolutely certain that he would not willingly put them on display to mortals such as ourselves. Jao is of a higher state of existence than us, but certainly not so high as Ken, as you will soon see. This is mere conjecture on your part, with no legs to stand on. Thus I present to you the facts:

CHALK VS. SUPER MAGIC BOX

While I admit Jao maintains an impressive record for super magic box calculations, the magic only takes these boxes so far: I think we can both agree that Davidson is obviously transcendental. Of course, super magic boxes provide rational approximations. As such, it is clear that a super magic box — even a super magic tesseract, for that matter — could never hope to completely ensnare Davidson. Frankly, Jao just wouldn't be able to keep up with Davidson's limitless nature, always one step behind despite his efforts. Before Jao knows it, he'll find himself slipped between the gaps in Ken's rational chalk. It's unavoidable.

SANDALS VS. ASCII

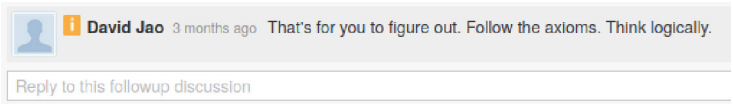
Although Jao, too, is allegedly transcendental, is it quite the stretch to call his build "Cybertruck-esque". Let's be frank here: he's got more of a 2003 Honda Civic Hatchback build than anything, and even that's being generous. Davidson would crush him swiftly and effortlessly, no doubt. Unfortunately for Jao, Ken uses UTF-16 (what else would he use?), which is of course not backwards compatible with ASCII. As far as Ken is concerned, Jao's ASCII blocks might as well not exist. And finally, although Jao is a post-quantum individual, the hardware simply doesn't exist to allow him to unlock his potential. His optimization techniques are blazingly fast, but simply out of consideration for the current hardware, leaving him no match for Ken. Conversely, Davidson's research into C*-algebras translates into enough mastery over the algebraic realm to simply rearrange Jao's existence and set him equal to zero. Nothing short of a brief, swift, painless nullification from existence. Perhaps this fate is preferable to a sandal-stomping from Ken? Chance yourself within sandal-stomping range of Ken, and see for yourself.

SQUASH VS. COWARDICE

There's a lot wrong with the assumptions you've made here — let's unpack them, shall we? First, I like to think Jao would have more pride and valor in his fight than to use his Tesla to briefly escape to the fourth dimension. What I would call that is cowardly, and I think he is respectable enough to agree. What you write also implies that you know Davidson cannot easily access n-dimensions. From his aforementioned mastery of C*-algebras and some other reasons I cannot disclose, I have good reason to believe that he can, indeed, access n-dimensions. With this, even if Jao even *tried* escaping into the fourth dimension, he would still be in Davidson's domain, and this within his squash racket's reach, whereby Davidson could fold in and flatten Jao back down into two dimensions, leaving behind a permanent racket-grid scar. But, I'll entertain your claim that Ken cannot access four dimensions. Even more, let's say Jao *was* a coward and tried escaping into four dimensions with his Tesla to build up speed. He destroys Ken's squash racket, fine — but Ken is a man who comes prepared to a fight. He's a man who plans ahead. He's a man who brings a second racket. With this racket to spare, he wipes the floor with a dazed Jao, still recovering from the four-dimensional impact himself. You might also be inclined to mention Jao's badminton career But do consider: does his badminton experience really stack up against Ken's squash mastery, which he refines almost daily? I thought not.

CHRONOMANCY? I THOUGHT THIS FINE PUBLICATION HAD STANDARDS

Do not mistake simple optimization techniques for chronomancy. Have you considered the possibility that Jao has employed the help of an AI to generate answers to Piazza questions? It's not out of the question, and it's certainly possible. I mean, come on, most of his answers look pretty similar, right? In fact, I'd go one further and say most of them are hardly answers to begin with.



You're telling me he actually spent his own time writing this? Sure. Even without this, you're neglecting the fact that transcendental folk like Jao and Davidson don't sleep. Of course he has the time to grade everything, he's not wasting any hours on our meager evolutionary, primitive holdovers of time such as sleep.

I'm not sure who would win in a battle between the TAs. They're just mortal people, still developing their abilities. It would be unwise for either party to fight the other at this point, and I think both sides appreciate that fact already.

Overall, given the recent allegations surfacing of Jao's anime-indulging tendencies, I'm no longer even certain of the purity of his power. And to you, "supermagictesseract", the Sword of Damocles isn't so threatening when, upon inspection, it's made of straw. I understand there will be no further debate on this important issue. Say it with me now: Kenneth Davidson would ruin David Jao.

jeff

A MATH 135 REVIEW (AND PORN)

With MATH 136 coming to theatres (or lecture halls) near you this term, I thought I would review some key MATH 135 concepts.

First, let's get the important things out of the way. Am I a MATH 135 professor? No. So what credentials do I have to make this review? I plead the fifth. After all, math is all about unanswered questions.

IMPLICATION

Consider the idiom, "if you like Pornhub, [then] you'll love Pornhub Live" (or however the fuck it goes, I can't verify with people around me). Yes, we are starting off strong, but so are the actors in the videos.

Note that this phrase says nothing about people who don't like Pornhub. If you don't like Pornhub, you can love Pornhub Live as much or as little as you please, but we are only considering people who do like Pornhub. Therefore, to show this idiom is based on 100% facts, we need to show that everyone who likes Pornhub also loves Pornhub Live. To disprove it, we can present a counterexample, a person who likes Pornhub but doesn't love Pornhub Live (i.e. literally everyone).

CONTRAPOSITIVE

The contrapositive of the example above would be, "if you don't love Pornhub Live, then you don't like Pornhub." Again we know this statement is false because there are people who don't love Pornhub Live, but like Pornhub.

CONVERSE

Okay look, when have you ever needed to use converse in your life. The shoes are pretty slick though.

SET EQUALITY

Consider these two sets:

1. Set A, consisting of people who **watch anime daily**
2. Set B, consisting of people who **don't have a girlfriend**

How do we show that these sets are equal? We show that set A and B are subsets of each other. That is, we need to show that:

- everyone who watches anime daily doesn't have a girlfriend
- everyone who doesn't have a girlfriend watches anime daily

Fortunately, I already know that the two sets are not equal to each other. This is because I *don't* have a girlfriend, but I also *don't* watch anime daily. As a matter of fact, I watch anime *every other day* (jk tho, I'm not a weeb).

CONJUNCTION (AND; ^) AND DISJUNCTION (OR; V)

Ha I made two winky faces in the subheading.

For a conjunction to be true, all of its components have to be true. For example, if you are on Tinder and a lady you fancy is looking for a man (and) who is at least six feet, you wouldn't make the cut if you are a woman or under six feet. Actually, to be more inclusive in my exclusivity, you wouldn't make the cut if you *identify as any gender that is not a man* or under six feet.

For a disjunction to be true, any component needs to be true. For instance, take the motto of the University, "Cali or Bust" (it really should be Cali xor Bust but that's a discussion for another day, we'll just treat it as an actual 'or'). If you Cali, our school's motto is true! If you Bust, our school's motto is also true! If you somehow both Cali and Bust, well I don't really have words for you, but the motto is still true! Only if you don't Cali and don't Bust, you render the motto a blatant lie.

GCD

I'm not covering this shit. Just don't confuse it with GHB, which is a **drug that you don't want in your drink**.

RSA ENCRYPTION

Alice want send message to Bob, but Eve sneaky sneaky! Alice pick big big primes to make message secret. Alice send key to Bob and keep another key. Bob already has a hard fucking time understanding what the fuck Alice is trying to say in plaintext, never mind ciphertext. Bob files for divorce and Alice loses custody of her children.

That's all the time we have for today. People complain that math has no applications to real life, but I think this article has dispelled this myth.

instantpoodles

THOUGHTS OF A FIRST TIMER AT mathNEWS

Hello friendos.

It's my first night at mathnews. Wait is mathnews capitalized or not? MathNews? no, that doesn't look right. Oh shit right its **mathNEWS**. As a long time reader of **mathNEWS** (since my first semester!!) I've always wanted to contribute. Unfortunately, a combination of too much school work, bad time management, and the fact that I get tired after 5 o'clock has made it a pipe dream until now. Tonight, you see, I am also tired, but my fridge is also empty, so I am writing under the promise of pizza.

My first blunder I have realized is not bringing my laptop and I've been cursed to use these uncomfortable Mac keyboards. Why is it when you log into a Mac computer every icon on the screen is so small? To have to go system preferences → displays → scaled resolution every time is truly one of humanity's greatest crimes.

I see someone from my Math 136 class. I say hi to him, but he doesn't remember me. I bring up that one time we lined up in V1 to get pizza, where he talked about how he's taking Genetics, but he still doesn't remember me. He's sitting in front of me. I angrily make eye contact with his back as I type all this. Yeah, I'm talking about you, guy whose first name starts with L and ends with h.

It is now 7:15. We are now discussing about pizza toppings. I am excited.

I can't wait to see this article published. I'll treasure this article proudly, bragging in every one of the 2 Facebook groups I'm in on how I am now a ★*published writer*★. I'll be a celebrity. I hope I won't let the fame go to my head. Now that I'll be constantly under the media's eyes, I'll have to start adopting famous people behaviours. Like using coasters or something.

I glance at the title of what the person beside me is writing. "The Eccentric Surrealism of **mathNEWS**". Hmmmm. So that's 2 words I have to google. I look at the person. He looks smart. I bet he spelled "**mathNEWS**" right on the first try. I ask if I could read his article. It's ridiculously good. So much better than mine. I feel sad. But it's ok! Because I'm trying my best, I tell myself.

In grade 3, we learnt that every paragraph should have 5 sentences. My last sentence had 13. That means I'm 2.6x smarter than everyone else, because I have 2.6x as much things to say. ($13/5 = 2.6$, idk if I have to show my work for this question)

Eccentric Surrealism guy looks at my last paragraph and laughs. I hope it's because it's funny, and not because I have the writing skills of a 8 year old.

Ok, that's it for now! This first article has been a wild ride, I hope to see you guys later! *[Editor's note: see you soon!]*

DragonicKhaos

"NUCLEAR EMERGENCY ALERT SENT OUT IN ERROR" EMERGENCY ALERT SENT OUT IN ERROR

PICKERING — An emergency alert sent out to Ontario residents Sunday to correct a previous emergency alert transmitted in error about an incident at the Pickering Nuclear Generating Station was itself transmitted in error, according to the province.

In a statement released on Tuesday, Ontario Power Generation, the agency responsible for the operation of the station, announced that an extremely serious Keter-class incident had indeed occurred. The agency warned of the seriousness of the incident, noting that the effects could potentially "exceed those of Chernobyl, Three Mile Island, Fukushima Daiichi, and Pickering combined."

An anonymous municipal official told us that the radiation levels in surrounding neighbourhoods are so high, police forces are attaching Geiger counters to their cruisers in lieu of sirens. Independent, verified sources from within the 10km exclusion zone have also sent in reports of plants quadrupling in size, talking frogs, and rocks spouting legs.

Trying to get a more detailed government response, we managed to stop Garg Rickover, provincial Minister of Energy, outside of his house for a quick interview.

"I'd make a comment on the state of affairs, but I really have to get my wife and kids in the car," he said, profusely sweating inside of a hazmat suit while carrying a three-headed pigeon his cat had caught in the backyard.

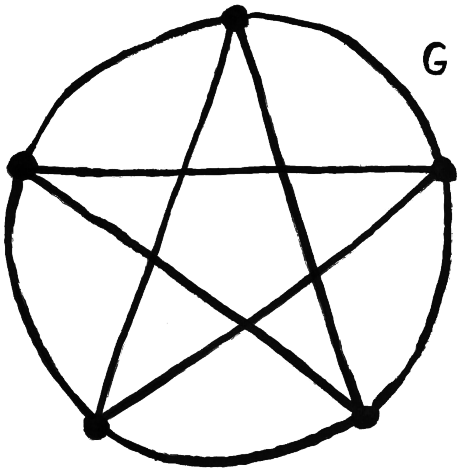
When informed by our reporter of his appearance, the Minister immediately sprouted an extra eye and four extra mouths, before emitting a guttural howl and ohgodishecomingtowardushel—

Completely Headless Nick

N WAYS TO MAKE SURE A BROKEN CHAIR IS NOT USED

- By putting the chair upside-down in a corner of the room.
- By placing a piece of paper, on which is written "BROKEN CHAIR", "CHAIR IS BROKEN", "DO NOT SIT YOUR BUTT WILL HURT", "DEATH TRAP", or some variation thereof.
- By swapping the chair with the prof's chair; the prof doesn't sit anyways.
- By putting a goose nest on the chair, goose included at your discretion.
- By assigning an official-looking person to stand guard, complete with hi-vis and clipboard and id badges, because no one would dare to mess with an official-looking person standing guard complete with hi-vis and clipboard and id badges.
- By assigning an unofficial-looking person to sit on the chair.
- By hanging the chair from the ceiling, like a spider waiting for its prey.
- By irradiating the chair in the Pickering Nuclear Generating Station.

Vesica Pisces and Injured Table



Circle for summoning a graph theorist. To use, draw on chalkboard (be sure all edges and vertices are clearly marked). Insist you can find a planar embedding of it, and a graph theorist will soon appear.

-transitivity

GET TO KNOW SOME NUMBERS

As a reader of **mathNEWS**, you probably have some familiarity with numbers. You probably interact with them regularly—but do you really *know* numbers? Their personalities? What they're really like on the inside?

No?

Well, you're in luck, because I can tell you about a few of them.

0 — Nice and neutral. 0 is a good choice if you need a number to mediate conflicts. It could host a good advice podcast, but it doesn't really have the inclination to.

1 — Very eager to be noticed. "I'm here!" it says. We know, 1. You're a unit. We need you. We get it.

2 — A bit of an oddball, 2 doesn't quite fit in. Sure, it's good friends with the other even numbers, but none of them quite understand what it's like to be a prime, you know?

3 — A very clean number. If you could smell it, 3 would probably smell like some sort of cleaning solution — all citrus on the surface, but with a chemical undertone. It creeps everyone else out just a little.

4 — A nice, solid number. Very sturdy and reliable. Similar to a brick, in some ways. If you need a number to build a house out of, or to help you break a window, 4 is a good choice.

5 — A no-nonsense number. It isn't afraid to cut straight to the point, even if it hurts your feelings. 5 will never lie to you, and as half of 10, it always knows exactly where it stands.

6 — It doesn't stand out much in a crowd, but don't mistake that for a lack of character. 6 may look quiet and unremarkable between its neighbours 5 and 7, but it's friendly, and always happy to talk.

7 — It seems eccentric and unpredictable before you get to know it, but deep down, 7 just wants to be loved.

8 — Similar to 6, but more mysterious. 8 seems trustworthy, but maybe just a little bit aloof. It knows some things. It's not hiding anything from you per se, but it's keeping some secrets about things that are none of your business.

9 — A very professional number. 9 wears a suit and carries a briefcase, and it won't put up with you if it feels you're wasting its time.

transitivity

2020 WATCH

EPISODE 1: THE PHANTOM OLD WHITE MENACE

Welcome to 2020, everyone. The presidential election is now only 11 months away, and so we are now entering the 14th month of presidential election coverage. I love you for that, America.

Even though I'm technically on co-op, I couldn't not keep writing for the Most Important University Publication Ever *[Editor's note: <3]*, so every two weeks, I'll be checking in on the state of the race and summarizing the most important news items. Join me, as we find out who can defeat Donald Trump (and the answer to that question might be no-one).

IOWA CAUCUS: WORLD WAR CORN

The first in the nation caucus is in less than a month, and all the candidates are fighting to notch their first victory in the literally year-long fight to be President. So, who's ahead in the corn-themed battleground? I dunno.

The polls are inconclusive, as polls often are. Both Biden and Sanders have been ahead in different polls, with Warren and Buttigieg in range for an upset. Unfortunately for those in the Yang Gang and the Klobuchar Kart, (or even the Patrick Plane?) the top 4 seem to have Iowa locked down. But just like they say on Family Feud when one family is obviously losing, it's still anybody's game.

THE NEXT DEBATE: BLUNDERDOME

However, before the demographically unrepresentative people of Iowa vote, the candidates will meet for one more debate. However, since it's happening the evening after production night, I have no idea what happened. If the editors don't let me put something else here, just fill in the rest for yourself.

Wow, what a debate! [candidate] really got in some good hits on [other candidate]! But, [third candidate] really stood out from the rest with their answer on [whatever was the main topic]. I think [someone] will really benefit from this one! The moderators were garbage though.

SANDERS V. WARREN — DAWN OF JUSTICE/PROGRESSIVISM

Throughout this whole process, one rivalry has loomed large over the field: who, out of Bernie Sanders and Elizabeth Warren, will claim the mantle of the left and face the centrist forces of the Democratic Party? So far, the two have stayed civil, as demonstrated in this awkward picture:

WHEN THEY'RE STAYING TOGETHER FOR THE KIDS

But, only one of them can be President / next person to lose to Trump somehow, and the time is ticking down to the start actual voting. A recent rumor that Sanders told Warren "a woman couldn't win" is, depending on your political persuasion, proof Sanders is not the progressive icon he claims to be, or dirty tricks spread by Warren supporters to boost a flagging campaign. The truth? Who knows?

Actually, considering the long lead time between writing and publishing these, you might know.

I mean, it's like a whole week from Monday, when I'm writing this, to Friday, when the issue comes out. Maybe on Friday, Yang is ahead, and on his way to being the first Asian President. Maybe Obama cancels the Constitution and runs for a third term. Maybe I'm President. Maybe *you're* President.

The real solution here is to consume as much Content™, as possible. Hopefully, for you that includes my column. See you in two weeks.

UW Unprint

NO BETTER TIME TO START A GAMBLING ADDICTION THAN THE PRESENT

I am currently writing this at 7:46 pm Jan 13th. I am currently a very broke 3rd year student with time to spare. That's why I have decided the best thing to do is to bet money on the national college football championship game which starts at 8:15 pm today. Do I have the financial funds to sustain a gambling addiction you ask? No. Do I know anything about American college football? No. But I DO have time to spare and I am in need of some cold hard cash. The game is Clemson University vs LSU, do I know anything about the teams? NO. However, I DO know how betting odds work. Just like the odds of me graduating double degree, the odds that Clemson wins are low. But if I have learned anything from my boring finance classes, it's that high risk means high reward. So… Go Clemson! By the time this article is published I will either be $30 poorer or $48 richer. Let's hope it's the latter.

Anon

A HARROWING EXPERIENCE ON THE ION

It's late. I've stayed at the Davis Centre long past most sane people have already hit the sack, fuelled by countless donut breaks from Tim Horton's, and straining to cram every possible way to prove things that have already been proven thousands of times before into my head. My Math 135 exam is tomorrow, and I need to head back to CMH to try and get a tiny bit of sleep. So I sleepily meander my way onto the ION platform, pulling out my WatCard and slapping it haphazardly on the scanner. Almost immediately, I notice the train to Fairway slowing to a stop beside me. Dragging myself onto a seat, I slump there. Waiting for the train to move its way down the tracks, to the one stop that will take me home.

I vaguely hear the automated announcement play, the train announcing its presence. The 301 to Fairway. It's almost 3:01 as it is, and all I want is the fair way towards my exam tomorrow morning. Why did the exam have to be scheduled for 9 in the morning?

So I close my eyes for a bit, waiting for the inevitable stop at the Laurier-Waterloo Park station. I breathe in, and out.

Set equality. *In* Contrapositive. *Out* De Moivre's Theorem. *In* Chinese Remainder Theorem. *Out*

The train doesn't stop.

I open my eyes. The windows are dark. The train is still moving. I try to look out, to see where the hell I've ended up, but the inky blackness refuses to let up. I stand up, and glance around.

The train is empty. I should have known.

I never should have had that last chocolate glazed from Tim's. I walk down the train, slowly, towards the driver's carriage.

As soon as I reach the accordion section, the train jolts to the side, causing me to stumble into the gaping, waiting maw of the folds of fabric.

Lost within the folds that seek to smother me and overcome me, I attempt to find my way out, but as soon as I start making any headway, the train jolts again, tossing me to the other side.

I'm wide awake at this point. Grabbing my WatCard, sharpened to a point by all the swiping I've done over the course of the term, I slash at the fabric, over and over, until finally it lies still.

I pull myself out. The train is still moving. The windows are still black. I walk forward, hesitantly, tentatively, reaching the driver at the far end of the train. Just a shadow, their black, inky form hovers in front of me. I lift up my hand to knock on the glass… and the train jolts to a stop, throwing me backwards into a seat.

I get back on my feet. The train tells me that I've arrived at Fairway Station. The last stop. I step out into the murkiness of the night, behind an old Leon's. The train sits there behind me, at the end of its track. Taunting me. I call an Uber. No way I'm getting back in that ION again.

The Uber pulls up. The driver rolls down his window and leans out at me. Slowly, with gaping horror, I recognize Shane Bauman himself. “Let's talk about induction,” he says.

Screaming, I wake up. The sun's shining, and I'm sitting in the ION shelter at the university, slumped against the glass with my face pressed right up against it. I jump up and start running to the PAC.

I just hope I didn't oversleep enough to miss the exam.

Predap

SOME WHILD ADVICE: TRYING NEW THINGS

Hey guys! It's ya girl Whild, and I'm starting an advice column. My friends often come up to me and ask for my worldly and expert advice on a variety of issues and I decided I might do you the honor of providing my incredible advice giving skills to all of you! So let's get started!

Recently, one of my friends was talking about how she wanted to try some new things on campus and expand her horizons, but she was too scared because she had no experience with any of them. Hypothetically, these clubs were Cabaret, Drag, and Rowing.

Trying new things can be really scary, especially because most of us have found a thing that we like to do and are perfectly happy continuing life just doing that one thing. However, trying new things can be an incredibly enriching experience, and even if you fail, you'll still learn something new and have a fun story to tell. One really important thing to learn is that failure is not a bad thing (unless you failed all of your classes the entire time you've been here — that's a bad thing). Failure is an opportunity to learn more about yourself, and your skills. When you see what you have done wrong, it is an amazing opportunity to learn what to do right. Additionally, if you try a new thing and you are bad at it, you've actually succeeded! You tried a new thing, you put yourself out there, and hopefully, you learned something. So I challenge all of my readers to go out there and try something new, be it painting, dancing, rowing, or hiding a body, I support you in all of it (except anything illegal, I do not endorse that, please do not sue me, please do not kill anyone).

Whild

A PRELIMINARY GUIDE TO KEEPING IN TOUCH WITH YOUR OFF-SEQUENCE FRIENDS

Another decade, another year, another term. We all have that friend who's off on an exotic co-op term hundreds of kilometres away while you're on campus for a study term. “Don't be a stranger” — the parting bromide you two exchanged when you last saw each other over a month ago. The both of you know that the chances of meeting each other again before your 4B terms are slimmer than the width of a slimy wet weasel crushed under a hydraulic press. Usually what happens is that your friendship slips away, slowly and unnoticeably at first, 'til it all comes to a head one day when you're scrolling through Messenger and notice that your once-friend is now buried at the very bottom of your conversation list. *Ouch.*

Most of us just go “fuck it” and let those friendships expire naturally like the curdling discounted yogurt at the back of our fridge, bittersweet and left to wither long after their better days. But you're different. That's why you've come to this article. You want to believe you and your friend will be able to overcome the barrier of physical separation in these trying times and preserve your friendship until you can one day meet again. It's admirable. Brings a tear to these laden, jaded, groggy eyes of mine (I haven't slept in 49 hours ever since the cyborg coyotes ran me out of Nosbonsing). But just how exactly will you keep in touch with your long-distance compadres over the next 4, 8, or 36 months? It's gonna be tough and there's no magic solution out there, but believe me, bitch, if I don't have some suggestions I pulled out of my ass at 12:42 in the morning just for you.

- Text every day. A simple, “How was your day?” exchange should suffice on most. Alternatively, send memes and cute animal TikToks when the conversation pool has run dry.
- Send voice memos every day. A bit unorthodox, but worth a shot. A lot more closer to the real person than a text. Plus, there's no way a tight-knit bond won't form from doing something as cutely quirky as this.
- Phone call every day. Simply the logical next step. It's your friend's voice, but in real-time!
- Video chat every day. You knew this was coming. Like a phone call, but your friend's face is in it! Removes some of the awkward stress in 4B when you two reunite and neither of you can recognize the other because one of you grew a full beard while the other had laser eye surgery in the interim.
- Mail each other things. Letters are cool. Postcards are a FUCKIN' THING with a PURPOSE, PEOPLE. Replicate the same feeling of receiving an AliExpress package in the mail that you ordered two months ago and promptly forgot about, except *better* since it's actually a parcel filled with dirt, twigs, and beach sand, sent with love from your friend.
- In fact, why not go the extra mile and send your mail through carrier pigeon? It's the '20s again, after all. In fact, why not go *all the way* and utter an arcane K'johïohl incantation to transfer some of your friend's soul energy into an Indian Fantail? Note that this tip only applies to a friend that lives within a 1,000mi radius of Waterloo. It'll be a while before cyborg pigeons are a thing.
- Pick up oil painting as a hobby and devote as much time as you can to it to master the skills you need to eventually paint a life-size, full-body portrait of your friend from memory. In order to accomplish this feat, you will have to continually think of your friend in all of your waking moments — which will prevent you from drifting away from them through neglect and forgetfulness. Plus, the painting makes a thoughtful, personal gift that I'm sure they will appreciate and hold onto as a heirloom to be passed down through their bloodline for ages to come, before Uzziah's Comet strikes the Atlantic Ocean and causes the Second Great Flood of Our Times. The painting style doesn't really matter, but I objectively think that Austrian-Expressionism-Or-Bust is the way to go.
- …Try to catch up with them when you're both in Waterloo during the break between terms? That's probably the most y'all can do. Godspeed.

Finchey

TOO MANY BACHELORS

Bachelor with Bachelor seeking Bachelor to live in. If not found will have to resort to searching for a Bachelor with a Bachelor to live with, preferably the Bachelor should also have a Bachelor.

Alternatively, if I actually wanted to communicate clearly:

Single person with a successful undergrad seeking an apartment to live in. If not found will have to resort to searching for another single person with an apartment to live with, preferably I would like to date someone with a university degree.

Beyond Meta

P.S. In case someone is going “BM aren't your real life pronouns she?” Yes this is true, however Beyond Meta's preferred pronouns are they. And the joke just works much better if I refer to myself as a Bachelor. And for the sake of a good joke my pronouns are flexible.
P.P.S. “I personally identify as an Attack Helicopter” is not a good joke.

THE ECCENTRIC SURREALISM OF mathNEWS

A new term, a new me. As I wait in the hallowed halls of MC for the journey to the computer lab, I start to consider my choices. Was this worth the gamble of the evening that I would have spent browsing WaterlooWorks, applying for jobs (or, more realistically, watching YouTube)? Factoring the pizza into the equation: probably.

So what makes this farce of a newspaper *[Editor's note: oi]* one of the things that keeps me optimistic amidst the constant grind that is a degree at the prestigious University of Waterloo?

Maybe it has something to do with that prestige. That when a faculty such as this becomes so famous, producing something so chaotic and carefree every second week becomes a necessity as an outlet for the renegade id of students who have had their creative juices sucked out just to stand a chance.

A newspaper that will publish an article about its own paper quality not being at good enough of a calibre to eat, that has its editors take a look at that article and deem it at all fit to publish, must see some sort of value in its own surreal qualities. The fact that almost anything anyone writes in this infamous computer lab finds its way to print serves as an example to the noble concept of Chaotic Good; all the news makes its way into these pages, fit to print or not.

So I think the reason that I open up these stapled-together sheets of paper a couple times a month is a testament to my love for people who frankly, don't give a damn, except about the very particular things for which they do give a damn. I think the appeal comes from the fact that I never really know what to expect when I open up the pages of a new issue. For, despite the weird and impossible so-called "articles", the renegade David Jaos and the dreamy Jordan Hamiltons, each few hundred words of the foam that gathered at the top of a prospective writer's mind I read chew me up and throw me back out, ready for another round.

The satirical sides of some articles may sometimes have a bit of an edge to them, but rarely are they actually scathing. Funnily enough, rarely are they objective, either. Except for the **mathASKS**, **profQUOTES**, and crossword, the issues are 90% editorial. In a normal newspaper, the editorials are the least interesting section to me, usually composed of the views of people I don't care about, that are almost never world-shattering. I would much rather think for myself. But when everything's an editorial, nothing's an editorial; people are free to express themselves and offer their offbeat takes on everything from the number of different salads they can order to their struggles working on an assignment.

So to the people who dedicate hours of their time each week to putting together such a crazy monument to the chaos so lacking in a faculty devoted to order and systems: thank you. The fact that this publication has existed for 47 years at this point is to me baffling and incredible, a testament to a newspaper that will never conform to the outside world's perception of what a newspaper "should" be, that spits in the face of objective journalism, and yet has still carved out its own niche within an academic institution.

And hey, if they had to bribe their contributors with pizza to do it: more power to them.

Predap

LE PETIT THÉORICIEN DES GRAPHES I

I'm proud of how much I have learned about graphs.

I had never seen a graph before, but I heard that every graph has brown spots and a very long neck and lives in Africa. Nobody told me whether they were all in the same Africa or if they each had their own. I asked my supervisor and she told me to "consider a map graph". This made me very confused because I've always tried to be considerate to everyone. Were the graphs mad at me?

Luckily for me, my supervisor also showed me a "big name" in graph studies. Their name only had nine letters, so I didn't realize how big it was until I increased the font size. I met him and he was very smart. He told me about all the things that graphs can do. Did you know that graphs invented graphics? I thought that this must have taken a lot of skill because graphs don't have fingers.

I've learned a lot.

Carol Monet

LE PETIT THÉORICIEN DES GRAPHES II

Failure is an integral part of the learning process.

This is understandable because integrals are hard. I once had to solve a double integral. My supervisor told me it would find the volume under a graph. It should have been a really big number because graphs are really tall. They have to be tall to eat the leaves on the tallest trees.

I integrated from its back legs to its front legs and from the ground to its head. But the graph moved while I was measuring, and I lost count.

Failure is hard. I don't want to fail anymore.

Carol Monet

WELCOME WEEK! (A GUIDE TO EVENTS & FREE FOOD)

Happy New Year, and welcome back to campus! It's supposedly the winter term, but the H2O keeps being fucking liquid and frankly, as a Winnipegger, I'm offended you have the audacity to claim this wimpy-ass January rain is any amount of "cold."

Anyway, meaningless assertions of fictitious superiority aside: here are some Events™ that MathSoc has planned for you this week!

FRIDAY, JAN. 17TH, 6:30–10 PM: BOARD GAMES & BOBA

Sign out a board game from the MathSoc Office (MC 3038) and come hang out with your friends in MC Comfy or the CnD! Bubble Tea provided, of course. (Run by your First-Year Representatives!)

Note: Bubble tea priority will be given to first-year Math students.

MONDAY, JAN. 20TH, 10–12 AM: MONDAY BREAKFAST BOOST

We'll be setting up shop in the 3rd-floor hallways of MC, right across from the CnD. Swing by to say hi and grab yourself a treat from our assortment of totally breakfast-appropriate snacks! (Including coffee. We get it.)

MONDAY, JAN. 20TH, 7–9 PM: RESUME CRITIQUE

Now, I don't know about you, but my resume is a hot three years old and might've been originally written in Comic Sans MS. Lucky for us clueless bastards though, there exist people who know what the fuck they're doing that are willing to help! Bring your resume, cover letter, and a job posting you're applying for to the CnD on Monday to get that feedback, and then hopefully get that bread. And also pizza.

TUESDAY, JAN. 21ST & WEDNESDAY, JAN. 22ND, 10:30–1 PM: MATHSOC CLUBS DAY

Curious about the mysteriously lively club offices lining the grim hallways of our dear MC? Stay ignorant and left out no more! Our locally sourced, fair-trade clubs will be lining the hall both days, enthusiastically vying for your membership. Make sure to check them out to get access to all their top-secret events designed to help spice up your Mathie life.

THURSDAY, JAN. 23RD, 1–4 PM: AFTERNOON TEA

Fine, I'll admit it's a little chilly after the sun goes down at 2 pm or whatever nonsense this half of the year insists on oppressing the Northern Hemisphere with. But regardless of the appropriate headwear for the weather, chilling with a mug of a warm tasty liquid with your friends is always a good time.

please come say hi I'm so lonely

Any of this sound up your alley? Great. No? Too bad; our armed forces will be coming to collect you for your reckoning regardless.

See you there!

MathSoc is love; MathSoc is life

LEAFS CANCEL REST OF NHL SEASON DUE TO INJURY

TORONTO — The Toronto Maple Leafs have announced the cancellation of the rest of the 2019–2020 NHL season effective today, owing to injuries that have decimated the team.

"It is to my deep, deep regret that we are unable to continue playing for our devoted fans," said Kyle Dubas, General Manager of the venerated club at a hastily-called press conference. "We would have loved to, but our analytics tell us that it's kind of hard to play hockey when both of your hands are holding crutches."

"Our thoughts are with the friends and families of the affected players, fans, and the media during this terrible, terrible time" he quickly added before ducking offstage, a sight immediately followed by a loud crack and a sharp wail of pain.

From the forwards, joining Ilya Mikheyev (hand) and Trevor Moore (concussion) on injured reserve are Pierre Engvall (leg), Frederik Gauthier (leg), Mitch Marner (missing leg), Alexander Kerfoot (extra leg), Zach Hyman (upper body), Andreas Johnsson (lower body), Kasperi Kapanen (middle body), William Nylander (entire body), Jason Spezza (unexplained eczema in the presence of family), John Tavares (snakebite), Auston Matthews (nose cancer), and Dmytro Timashov (leg).

The backend has been similarly decimated, with Jake Muzzin (foot) and Morgan Rielly (foot) being joined by Travis Dermott (hand), Justin Holl (abdomen), Martin Marincin (ankle), Cody Ceci (pylon), Tyson Barrie (wrestling accident), Rasmus Sandin (exhaustion), and Timothy Liljegren (leg).

Those between the pipes have also not been immune, with Michael Hutchinson (groin) and Frederik Andersen (back) out for the season.

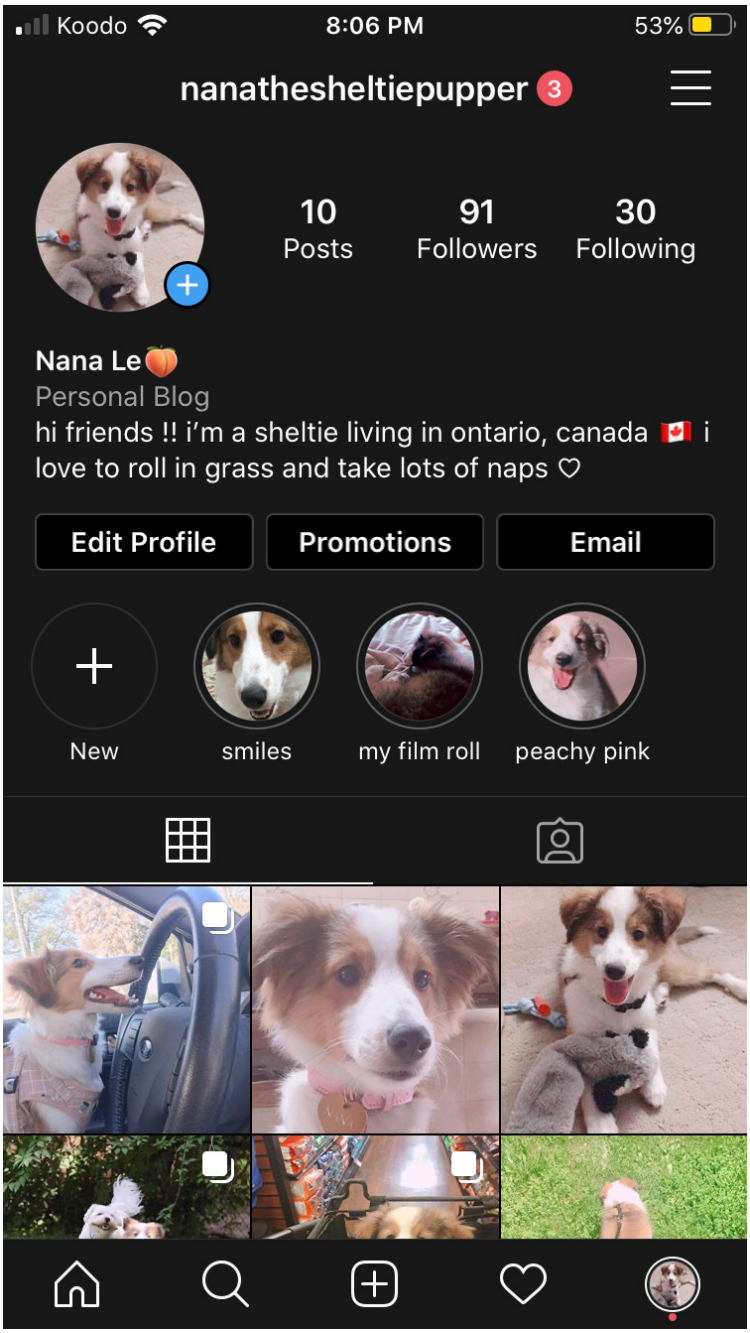
At press time, Leafs brass had considered simply fielding the Marlies, only to discover that they, too, had cancelled their season due to all of their players being called up to the Leafs.

60YearsAndCounting

N REASONS TO LOVE MY DOG NANA

- She has a fluffy butt
- She has a cute smile
- She loves sweet potatoes
- When she runs she goes nYoOoM
- She loves to do tricks, her favourite one is to play dead

hoe chi minh



DOES \(\MATHRM{mathNEWS}\) REALLY SUPPORT \(\LATEX\)?

In this article I will try to break the **mathNEWS** \(\LaTeX\) scripts.

Editors, please do not try to fix any broken output. *[Editor's note: Don't worry. We didn't.]*

\[e^{i\tau} = 0\]

\[\operatorname{**mathNEWS**}\left(\frac{a}{b} \right)\]

\[\mathrm{TRUE} \land \mathrm{FALSE} = \mathrm{FALSE}\]

\[\int^{\int^{\int^{\int^{\int}}}}_b\]

\[\frac{\operatorname{**mathNEWS**}}{\operatorname{**profQUOTES**}} = \emptyset = \varnothing\]

Is **mathNEWS** Turing complete? If the next line says "2", then **mathNEWS** is capable of calculating 1 + 1.

\[\newcount\cnt \cnt=1 \advance\cnt by 1 \the\cnt\]

How well does **mathNEWS** support bad \(\LaTeX\) code? The next two lines use wrong/horrendous syntax.

\[\int{{{{a}\]

\[\frac{a}bb}\]

Testing Expert

AND I CAN'T STOP THINKING ABOUT YOU

do you want me

do you need me

cuz i think i'm falling in love

don't go

M-A-T-H

horrorSCOPES, BUT WITH @DRIL TWEETS

ACTSCI

wint
@dril

my stystem can predict all lottery numbers with 100% accuracy. but not the powerball number. it is too powerful

♡ 9,839 12:42 AM - Aug 24, 2017

1,653 people are talking about this

AHS

wint
@dril

concerned about t he health of my followers, many of whom appear sickly and have chapped, unwashed elbows, stained with grime

♡ 12.8K 1:51 PM - Jun 1, 2018

1,749 people are talking about this

AMATH

wint
@dril

i squint real hard while attempting to contemplate a math problem designed for children until my entire dumb ass face turns navy blue

♡ 670 11:18 PM - Jan 16, 2014

328 people are talking about this

ARCHITECTURE

wint
@dril

THHEYRE GOING TO MAKE A LOT OF FUCKING BUILDINGS IN TH NEXST COMING YEARS SO MAKE SURE TO INVEST A LOT OF MONEY IN WOOD

♡ 1,151 5:57 AM - Sep 16, 2014

416 people are talking about this

ARTS

wint
@dril

most important art movements in human history?? three way tie between impressionism, cubism, and Bullet Time

♡ 1,128 11:00 PM - Oct 18, 2013

565 people are talking about this

C&O

wint
@dril

klout score + IQ = Amount of $ in bank

♡ 3,405 12:27 AM - May 8, 2017

706 people are talking about this

CS

wint
@dril

ME: COMPUTER... SORT THE POSTS ON THIS SITE FROM LEAST TO MOST RACIST
COMPUTER: YES MASTER
ME: COMPUTER... PLEASE DO NOT CALL ME THAT

♡ 11.4K 6:33 AM - Mar 30, 2016

3,403 people are talking about this

DOUBLE DEGREE

wint
@dril

if i learned anything in business school its that you can disarm any competitor by insinuating he carries his turds around in his briefcase

♡ 529 1:34 PM - Oct 15, 2013

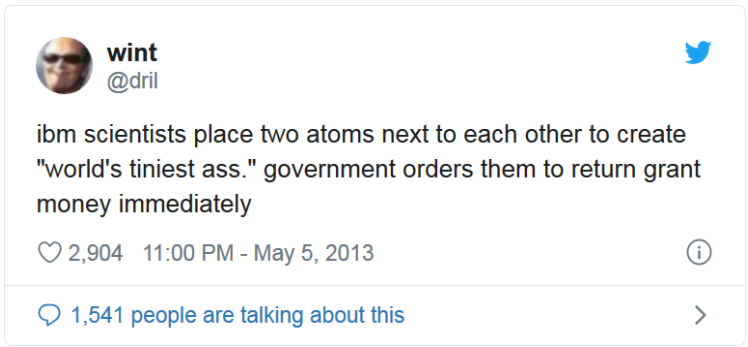
209 people are talking about this

ENGINEERING

PMATH

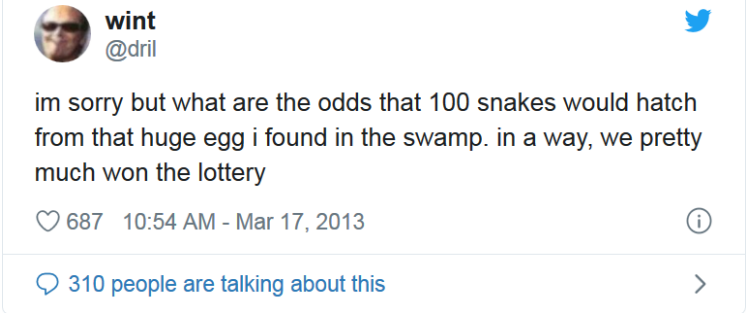
ENVIRONMENT

SCIENCE

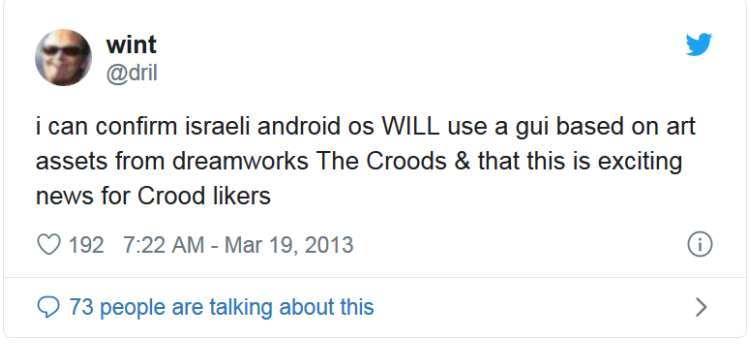


FARM

STATS



GBDA



We crowdsource articles in exchange for pizza.

It's a damn good deal, until they make you Editor.

A DISILLUSIONED mathNEWS EDITOR

STAIRWAY CONSTANTS, PART [0,1)

In the W19 term, a number line was added to the north-northeast stairwell in MC (the one near the DC and M3 bridges), putting CC's 2018 review of vertical transportation mechanisms in MC out of date. Well, things haven't changed that much. If anything, the number line has only further solidified the stairwell's position as the nicest one in MC. Perhaps now it is also the most educational stairwell in UW.

But is it really educational, or just an expensive spiral of black paint? What can we learn from this piece of art (and the wealth of mathematical knowledge on the Internet)? I invite you out for a walk: MC north-northeast stairwell, basement level. Bring this article with you.

FLOOR 0

"This place exists?" Of course there's a Floor 0. What kind of heretics would start their number line at 1? You look around, and there's not much down here other than a really loud pipe and a door you're not allowed to open. It's as if this landing exists solely to host the start of the number line.

To the left of the big pink 0, the black number line gives you a taste of the negative numbers, until it runs into the wall around -0.2. (You remark that they could have fit -1/12 in there, and wonder why they didn't.)

Slightly to the right of the big pink 0 is a silvery plaque:

ϵ
arbitrarily small positive number

After taking calculus, the response is automatic: there exists a positive δ which is sufficiently small to guarantee that something else is less than ϵ. In that sense, δ is also an arbitrarily small positive number, but disappointingly, they seem to have left it out.

Or maybe it's just a bit further along. You turn right and begin to follow the line. The tick marks count up by the hundredths, and you count 11 before you get to the next number. Unfortunately, it's not δ.

L
Liouville's constant
0.11000100000…

(For more digits, see OEIS A012245.) Joseph Liouville was a 19th century French mathematician, known for proving the existence of transcendental numbers. The proof goes like this:

1. Lemma: Liouville numbers exist.
2. Lemma: all Liouville numbers are transcendental.
3. Profit.

A transcendental number is a number that is not the root of any polynomial with integer coefficients. Transcendental numbers are some of the most interesting numbers, and include superstars like π, e, and e^π.

But what are these magical Liouville numbers? To discuss them, we need a concept of approximation for real numbers. Take Liouville's constant (L), for example. One way to approximate L is with a sequence of rational numbers that converges to it. For a first attempt, let the qth term be the closest rational number that has the denominator q.

$$\frac{0}{1}, \frac{0}{2}, \frac{0}{3}, \frac{0}{4}, \frac{1}{5}, \frac{1}{6}, \ldots, \frac{1}{12}, \frac{1}{13}, \frac{2}{14}, \ldots, \frac{2}{22}, \frac{3}{23}, \ldots, \frac{3}{31}, \frac{4}{32}, \ldots$$

At most, we're off by $\frac{1}{2q}$, so the approximations get closer to L as the sequence goes on... really slowly. What if we only kept "good approximations": the fractions with denominator q that are within $\frac{1}{q^2}$ of L?

$$\frac{0}{1}, \frac{0}{2}, \frac{0}{3}, \frac{1}{8}, \frac{1}{9}, \frac{2}{18}, \frac{3}{27}, \frac{10}{91}, \frac{11}{100}, \ldots$$

This converges much faster. In theory, we could make the closeness criteria as strict as we want. $\frac{1}{q^3}$? $\frac{1}{q^{43.7}}$? As long as there are infinitely many of these "really good" approximations, we can form a sequence that converges to L. However, this is impossibly rare. For example, π can at best be approximated by an infinite sequence with a precision of $\frac{1}{q^2}$.[1]

Liouville numbers are those impossibly rare numbers. They are defined as all numbers which have infinitely many rational approximations within a margin of $\frac{1}{q^n}$ — for any n. Even if I take $n = 5040$, I can find a fraction $\frac{p}{q}$, which is within $\frac{1}{q^{5040}}$ of Liouville's constant. And then I can find another, and another, and another… infinitely many of them.

Liouville proved the existence of his numbers by showing that for any integer $a > 1$, the following is a Liouville number:

$$\sum_{k=1}^{\infty} a^{-k!}$$

If you plug in $a = 10$, you get L, Liouville's constant. (If you would rather work in binary, plug in $a = 2$, and check out OEIS A092874.) *Exercise: find a rational number $\frac{p}{q}$ which is within $\frac{1}{7}q^{42}$ of L.*

FLOOR 0.5

The sound of fluids rushing through pipes is a bit quieter now. You are a mere 10 steps up from the great pink 0, which you can still see. Next to you is a much more imposing pink 0.5. A scientist would grumble that this style is inconsistent, because it gives 1.5 more significant figures than 1. An artist would grumble that this style makes 0.5 looks more important than

0. A mathematician would grumble that symbolically, 0.5 is a construct of our arbitrary base 10 system. At least it looks cool.

To the left and right of the questionable pink number, are two plaques:

P
Prime constant
0.4146825098…

(For more digits, see OEIS A051006.) Depending on how many digits of the square root of two you know, you do a double take. Is that $\sqrt{2}-1$? It isn't, but you wouldn't be wrong about the remarkable two-ness of this number. If you convert the prime constant to base 2, you get 0.011010100010100010 10… (for more digits, see OEIS A010051). The prime constant is known to be irrational, but Wikipedia says (without citation) that nobody knows whether it is transcendental. (Perhaps you can find out?) *Exercise: why is it called the prime constant?*

γ
Euler-Mascheroni constant
0.5772156649…

(For more digits, see OEIS A001620.) Leonhard Euler was the first person known to identify the significance of γ, and needs no introduction. Lorenzo Mascheroni was born 43 years after Euler; he mastered Euler's techniques and calculated γ correctly to 19 decimal places by hand![2] We can distinguish γ from the other umpteen numbers named after Euler because it's the only one that's also named after Mascheroni.

But what is γ? Everyone who hasn't forgotten first-year calculus should be familiar with the pain of Riemann sums:

$$\ln(n) = \int_1^n \frac{1}{x}dx \approx \frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \cdots + \frac{1}{n-1} = \sum_{i=1}^{n-1} \frac{1}{i}$$

But this is pretty nifty: if we don't have a calculator, we can add up a bunch of simple reciprocals by hand to approximate $ln(n)$. The only problem is, we overshoot by a bit, because this is an upper Riemann sum. At $n = 7$, the error is more than 0.5; at $n = 70$, the error is more than 0.57. Keep increasing n and eventually the error exceeds 0.577, then 0.5772, then 0.57721… and so you get the digits of the Euler-Mascheroni constant. (This is not a good way to compute γ.)

$$\gamma = \lim_{n\to\infty} \left(\sum_{i=1}^{n-1} \frac{1}{i} - \ln(n) \right)$$

In a nutshell, the Euler-Mascheroni constant is the error term of an ambitious crossover event between the discrete and continuous worlds of mathematics. Because of this, it pops up in all sorts of weird places. Perhaps the coolest example is Robin's Theorem. If you find a number $n > 5040$ whose positive divisors (including 1 and itself) sum to more than $e^{\gamma} n \ \ln(\ln(n))$, you will have refuted the Riemann hypothesis. If you prove that no such number exists, then you prove the Riemann hypothesis. *Exercise: prove or disprove the Riemann hypothesis.*

FLOOR 1

Climbing another 10 stairs, you return to civilization from the depths of the basement. A big pink 1 greets you with congratulations. This is where we leave off, but before you can exit, another plaque introduces itself.

G
Gauss's constant
0.8346268416…

(For more digits, see OEIS A014549.) Like Euler, Gauss needs no introduction. However, his constant likely does. Rooted in the depths of very hard integrals, Gauss's constant is involved in a great number of seemingly unrelated problems under topics like:

- the gamma function
- the arc length of an ∞-shaped curve called the lemniscate of (Jakob) Bernoulli
- definite integrals of $\sqrt{\sin x}$ and $\sqrt{\cos x}$

In fact, the constant is named after Gauss because he proved that G is the value of yet another very hard definite integral. Thus, with regard to undergraduate math, Gauss's constant is probably the most esoteric one so far. Nonetheless, its definition is well within our grasp. G is the reciprocal of the arithmetic-geometric mean of two simple numbers: 1 and $\sqrt{2}$.

$$G = \frac{1}{\operatorname{agm}(1, \sqrt{2})}$$

The magic behind G is the "agm" part of its definition. The arithmetic-geometric mean of two positive numbers x and y is the limit of a pair of sequences (a_n) and (g_n) defined like this:

1. Let $a_0 = x$ and $g_0 = y$.
2. a_{i+1} is the arithmetic mean of a_i and g_i: $\frac{a_i+g_i}{2}$.
3. g_{i+1} is the geometric mean of a_i and g_i: $\sqrt{a_i g_i}$.

Exercise: prove that (a_n) and (g_n) have the same limit. The sequences converge very quickly, so in a few operations on a normal calculator, you can compute G to high precision. Just remember that back when Gauss was your age, he had to do it by hand.

So there we go, the first floor of a multi-floor series dedicated to the constants that decorate the north-northeast stairwell in MC. (Special thanks to UW Unprint's LaTeX magic for making this article possible!) Next time, we pick back up at Floor 1 where we left off.

Exercise: don't take the elevator.

water

1. Contingent on a very recent paper by N. A. Carella that probably hasn't been peer reviewed yet.
2. According to http://www-history.mcs.st-andrews.ac.uk/Biographies/Mascheroni.html. Fumbling my way through the Latin manuscript by Mascheroni himself, I was only able to find 16 digits.

MAYBE, SUPPOSEDLY, SOME MATH

In the life of this **mathNEWS** writer, one question has always plagued them and made them reconsider their choices in life.

Why would someone ever refer to themselves in the third person? But, more importantly, what exactly is math?

Google tells me that it's the abstract science of number, quantity, and space. Which, I suppose, is fair. Most of the time. But what about things like logic? Is that math? According to this definition, even applied math might not be abstract enough to apply. So, what, exactly is math?

Is anything posted in **mathNEWS** really math? The only quantity and space that the editors seem worried about is the quantity of chairs left in this overly packed production night, and the space which all these articles will take up.

I feel that **mathNEWS** has moved away from the study of math, and so I propose to bring this glorious publication back to its starting point, back to basics. Back to math. So if this is the abstract study of number, quantity, and space…I suppose I shall do the one thing that is truly math.

Now, a real math question. What is the number and quantity of spaces that I placed before the sentence preceding this one? Send all answers to M2 90πi, and you may receive an award of grudging congratulations from the mysterious mathematician who occupies a room with an imaginary number. Or not, it's not like I'm them.

Predap

CRA REPORTS UNEXPECTED NUMBER OF REFUNDS BEING DISBURSED TO UWATERLOO STUDENTS

OTTAWA — The Canada Revenue Agency has reported an unusual number of refunds disbursed for the 2019 tax year, all to University of Waterloo students.

"The CRA is in the process of researching why the heck we have all of this extra money," said Amanda Wilhem, spokeswoman for the CRA. "The $550.44 given to each of the 30,000 students could have easily paid for our year-end party, but now we'll have to settle for a budget of $100 and Margaret's high-school cooking skills."

Reactions from University of Waterloo students, however, were significantly more jubilant.

"Finally, I can pay my private investigator for helping me look up recruiters!" shouted an AFM student who wished to remain anonymous.

"With this money, I finally might have enough to bribe Math admissions into letting me transfer into CS," wistfully said David in ECE.

"Honk," honked Mr. Goose.

As of press time, the CRA has yet to formally respond to any of our questions, citing an overwhelming influx of part-time job applications for survey takers.

quantumgoose

UWU

u u w w w u u
u u w w w u u
uuu w w uuu

Thank you for coming to my TED Talk.

PumpkinSeed

profQUOTES 142.1

CS 146: ROB HACKMAN

❝ I don't know how to draw a good omega, so these are just double-u's.

❝ I should get to know you guys better before I'm mean.

❝ If I'm being mean, it's with love.

❝ That sounds like something an abusive father would say.

❝ This class ends at 1:00, right? [students: 12:50] That's 1:00 in academic terms.

❝ I was wondering that because someone kept looking at the clock. Maybe they're just trying to figure out how much more of this they have to sit through.

CS 245E: JONATHAN BUSS

❝ How do I give you the squaring function? Well, I'll just pile it up and give it to you.

❝ [coat falls off chair] I'll give it lesser potential so it falls less [kicks coat under table]

❝ Spooks are allowed to have nightmares. That's their job.

CS 246E: BRAD LUSHMAN

❝ Now you can see why I'm incensed: I have to make my vector larger, by at least a byte!

❝ I spent this entire term building up this amazing vector. Who's going to buy my vector if using it wastes the size of a pointer?

❝ In C++17 we won't be able to do this anymore, which is really sad because it's such a nice last lesson. Maybe I can lie to them and and tell them we still need to do this.

❝ Perhaps this is the only time in your lives you will use protected inheritance.

❝ If anyone has a final, please give it to me.

CS 343: CAROLINE KIERSTEAD

❝ Assuming the CSCF doesn't blow up the undergrad environment yet again…

❝ µc++ goes down dark alleys, mugs other languages, and steals their interesting bits.

PMATH 446: RAHIM MOOSA

❝ The best way to say this proof is "Exercise!"

PMATH 446: DAVID MCKINNON (SUBSTITUTING FOR MOOSA)

❝ An exact sequence is a really stupid looking thing. It looks like something somebody came up with as part of a puzzle to torture people with.

❝ It's a little like linear algebra.

❝ I'm going to take this and I'm going to throw in two extra homomorphisms which are extra stupid.

PHIL 259: NICHOLAS RAY

❝ Worse things have happened than an academic press facing oppression.

❝ I tend to try to *not* screw students over.

❝ He'd just walk up to people and ask them "What is justice anyway?", and they'd say "Fuck off Socrates."

❝ And that's why [Socrates] was put to death: for being annoying.

❝ I could be in the same room as a tiger…there's one behind me right now, isn't there?

❝ I don't think electricity is real.

STAT 241: YINGLI QIN

❝ Both of [me and my husband] are professors in this department. It's quite boring.

❝ I'm considering giving you some bonus marks. Just kidding!

MUSIC 140: SIMON WOOD

❝ That's what got me through university: hydration. And good marks.

❝ How many of you have professors who are miserable?

❝ Fucking engineers.

❝ I'm one of the guys who gets executed for treason.

❝ Waterloo: could be worse.

❝ Don't cheat. If you do, you'll probably be very good at it 'cause you're Waterloo students.

❝ I measure my success by how late I can get in my day without having to put pants on. Today was a fairly good day, I made it to 3pm.

HOW TO ASSIMILATE BACK INTO SCHOOL AFTER DOING CO-OP FOR 8+ MONTHS

If you're like me and you just came back to (one) of your last terms for your UWaterloo undergrad, then you may be thinking to yourself: how the hell do I school again? How did I ever take 5 courses in a single term and survive? Well that's a good fucking question, because quite frankly I'm not sure either (any help would be appreciated pls contact me). *[Editor's note: same]*

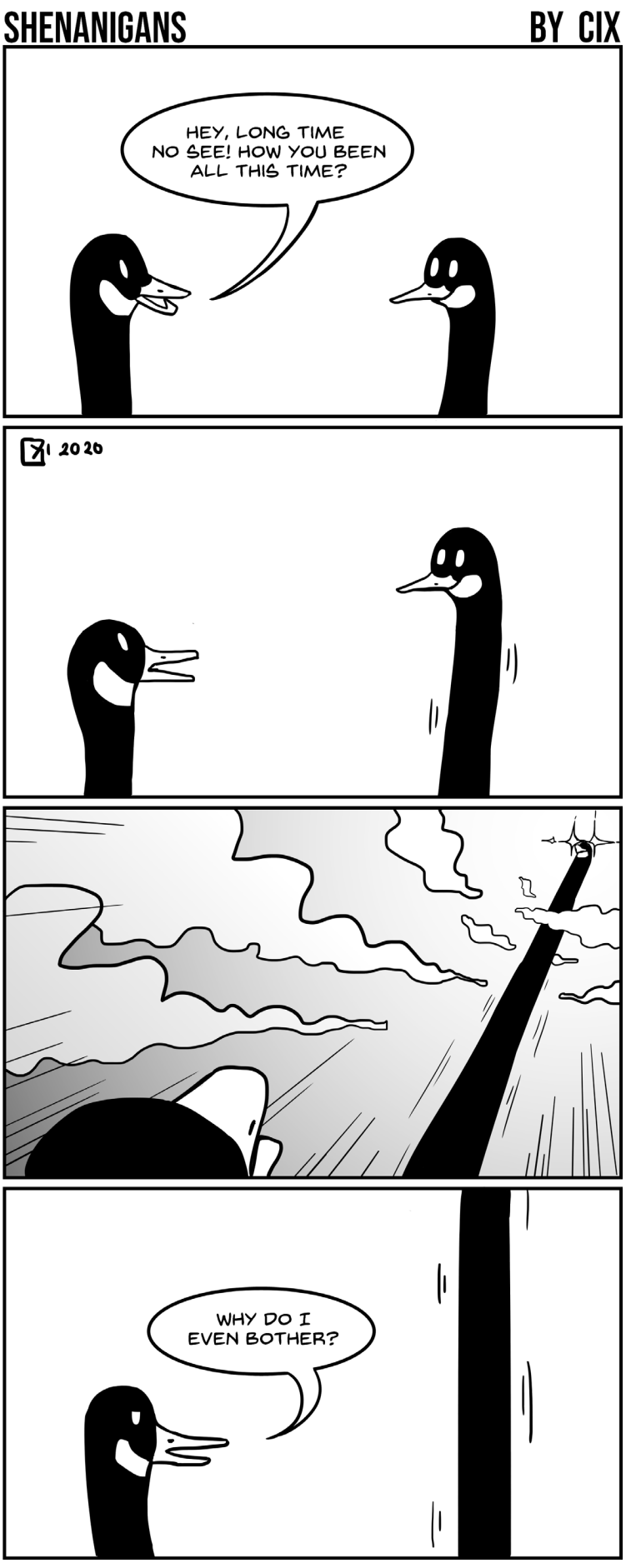
In the meantime, I've come up with a comprehensive list of things that I have personally done within the past week. Take it with a grain of salt (or a pull from a joint — I think it's more enjoyable this way).

- Get high (if that wasn't already obvious)
- Procrastinate by coming to production night (and preparing for production night every other night)
- Operate on 4 hours of sleep only and complain every single morning that you're exhausted and need more sleep
- Take only 3 courses (yes. Only 3. I can't handle any more than this anymore. This is what you have to look forward to).
- Occupy your free time with plans to see friends you haven't seen in 8 months and wonder where all the time went. Where did it go. I swear I was 17 last year. What is an eboy
- Acquire a Switch. (In retrospect this is a terrible idea on top of all the other terrible ideas I've already listed. This idea, however, is particularly terrible because it is much too easy to waste every night playing Breath of The Wild. Proceed with caution)
- Scroll through the depths of TikTok and wonder what life choices you made that got you to this point. Any and all knowledge of my CS degree has now disintegrated and has been replaced by distant echoes of TikTok songs and the sad, sad regret of having been born
- Stan Red Velvet (stream Psycho! Mwah)

Can't say I was entirely in my right mind making this article. I wish I were high, because I think it would've yielded funnier results. But I guess if I got anything out of this, it's that my writer name is finally fitting in.

Good luck with the term!

Herbie



I WONDER HOW MANY PEOPLE ACTUALLY READ THIS

gridCOMMENT *142.1*

Hello everyone! While I still lack the technicals of how to operate this iron throne that Zethar left me, I can hope that the dawn of a new decade will allow me to make 10-year plans that include 'figure out how to operate this lone icy chair'. I still miss that guy.

With many sages of old departing for their co-op shenanigans and many new returning from co-op, this location has become a place I only semi-recognize. This constant amorphous shifting of the student body is truly a unique experience detached from high school and before, and serves as another obstacle for Waterloo students to overcome.

Anyways, the boilerplate you all are here for. For those who are hopping onto the **mathNEWS** bandwagon for the first time, the **gridWORD** is apparently a feature column (Editors, don't you have anything better to feature?) where the **gridMASTER** (me) spends about 2 hours to jumble a **gridWORD** (a fun little crossword found below) for everyone to enjoy in exchange for pizza. So yeah, modern indentured slavery at its finest.

The editors also bribe provide rewards in order to motivate the solving of the crossword. It goes to the person who gets the most correct, and this is a contest anyone can get in on (Yes, even non-math people). To enter, you need to:

1. Solve the grid.
2. Actually solve the grid. (There was a time when someone submitted a blank one once. Since he was the only one to submit anything, he got a prize. So yeah. Let's not let that happen again.)
3. Include your name and optionally a moniker to be credited under. The name is mandatory as the editors need to know who won in order to actually hand out the prize.
4. Optionally, include your answer to this issue's **gridQUESTION**. This serves as a tie breaker; for if there are multiple people that got the most correct, my favorite answer decides who wins this mini contest.
5. Submit before the deadline(6 PM, Jan 27) either physically to the **BLACK BOX** mounted next to the Math Coffee + Donuts neon sign in the 3rd floor hallway at MC or electronically to mathnews@gmail.com

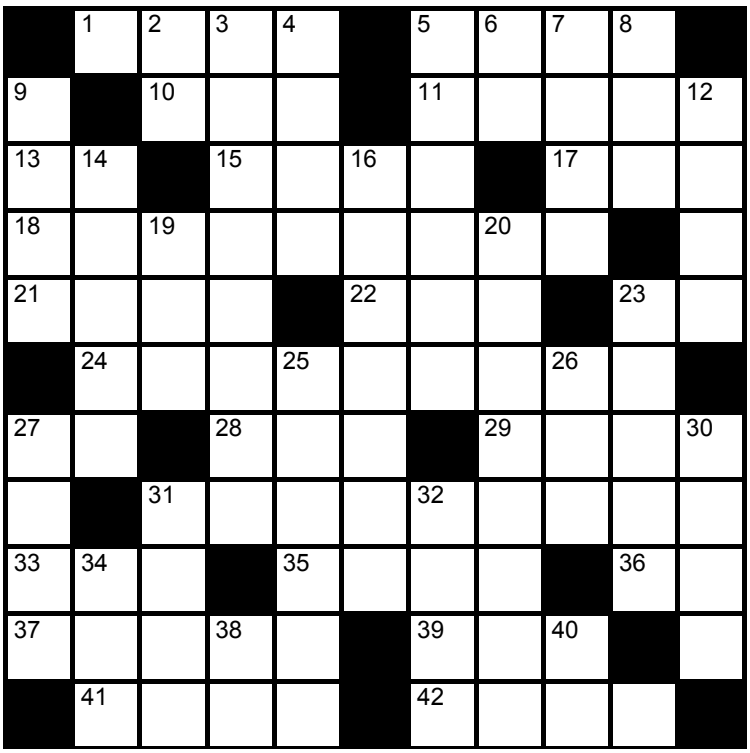
Group submissions are also welcome (v141i6 I received a submission from 5 people, so that was fun) but in the event a group does win, I foresee bloodshed on who obtains the reward.

Apologies on a rather small **gridWORD**. This was the first time I actually had to create one, and I still being inexperienced didn't have much time to create a larger one. But as I make more, I should be able to eventually make the standard 15x15 ones. But for a short while, enjoy having to do less work for the prize!

Anyways, happy solving, and see you in 2 weeks! Oh, and this issue's **gridQUESTION** is "How would you prank a **mathNEWS** Editor?"

[Author's note: I may or may not try the winning submission's answer on one of the editors.]

Solar Flare



ACROSS

1 What that can't be (4)
5 __ science / __ processor (4)
10 Airbnb alternative (3)
11 Departs (5)
13 Aloft (2)
15 Campus military organization (abbr) (4)
17 US confederate general (3)
18 What probably occurred at ½/2020 (9)
21 Non-conservative energy (4)
22 Solemn vow (3)
23 Related to circles (2)
24 Piano bar (6,3) (6,3)
27 Singular version of 26-Down (2)
28 Scrap paper (3)
29 A joke raid: __ 51 (4)
31 Deflect (9)
33 A period of time (3)
35 Possible kidney stone cause (4)
36 Ergo (2)
37 Robot part (5)
39 Slime (3)
41 Sharpen (4)
42 Requests (4)

DOWN

2 Friendly greeting (2)
3 Reciprocally (2) (2,6)
4 Highbrow one (4)
5 We just entered a new __! (6)
6 Wood splitter (2)
7 What letters in crossword puzzles are encased in (4)
8 Absorbed (3)
9 Lots of (4)
12 ½ (4)
14 Sunburn woes (5)
16 Catalyst (7)
19 __ Tzu, ancient chinese philosopher (3)
20 Pipe fillers (8)
23 Warm-up (5)
25 Scientific journal (since 1869) (6)
26 Used to be art (3)
27 News clipping (4)
30 Micro amount (4)
31 Interested in (4)
32 Latvian city (4)
34 Cry of pain or pleasure (3)
38 E's lost one (2)
40 Satisfactory (2)

lookAHEAD

SUN JAN 19	MON JAN 20	TUE JAN 21	WED JAN 22	THU JAN 23	FRI JAN 24	SAT JAN 25
		Fall 2019 official grades available in Quest First-round co-op applications close at 9AM			Last day to drop classes with 100% fee refund	Drop with WD begins

SUN JAN 26	MON JAN 27	TUE JAN 28	WED JAN 29	THU JAN 30	FRI JAN 31	SAT FEB 1
	Co-op interviews begin	Second round co-op applications close at 9AM			Winter 2020 Final Exam schedule released	

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