



"WHAT WOULD YOUR LEARN BLOG BE ABOUT?"

Welcome back everyone!

I'll be real with you guys with a second. I had a really, really nice **mastHEAD** here all written up for you guys. It was great, it was interesting, and it summarized the issue. But somehow, I did not save it, and I'm just finding this out now after I've finished layout and scrolled all the way back up the top of this InDesign document.

So that's the glamorous life of an editor.

I can sense the computer I'm writing this on gasping it's dying breaths, so let's just jump right to what's in the issue.

For you fine people today, we have the man himself, Nomair Naeem, here to answer your questions about C++, online education, and apparently how the burgers he made for us weren't that great.

Your MathSoc President, Ina Wang, is also here to commune with her constituents in the spirit of democracy. She's basically asking for complaints, so you should take advantage of this rare opportunity.

For the aspiring chefs, we have a pasta recipe, and as a practitioner of the pasta arts myself, I approve.

We also have another installment of *Articles Stemming From Weird Production Night Conversations*: two whole articles about Charlie Chu, LEARN blogger/amateur filmmaker. This is probably the closest we'll get to an entertainment section.

If you think Quest was a good dating site, just wait until you read our article about LEARN. It even has DMs!

And of course, we have the **mathNEWS** classics: Feridun and goose jokes.

That's it for our third issue of this term. I'll leave you with an observation: all the meme numbers are divisible by three. 21, 42, 69, 420, 666, 9000. What could it mean? I'm assigning boldblazer, our resident OEIS specialist, to investigate.

god ⚡ peED
Editor, **mathNEWS**

clarified
Editor, **mathNEWS**

TENDSTOFORTYTWO	Cryptic hints about where I hid stuff, and other, unrelated cryptic hints about what that stuff is
CC	A lone blog post welcoming people to my blog and congratulating them for finding it, then silence.
QUANTUM GOOSE	Replacement for the mathNEWS wordpress.
BOLDBLAZER	There's a LEARN blog?!?!
A COOL PEN NAME	How to stalk other LEARN users after finding their 200-page blog from 2013
ROYAL NO.69 MILK TEA	My ratings of every water fountain on campus
DERIVING FOR DICK	When did LEARN support blogging?
JEFF	How to access the secret hidden dedicated dating service built into LEARN
FINCHEY	A daily journal where I overshare about my personal life, in a feeble, grasping attempt at some kind of online fame, notoriety, or legacy. I'd also pepper in some ill-inspired short stories here and there.
MATHSOC ELECTIONS COMMITTEE	How you should vote in the MathSoc election at vote.wusa.ca
PSYCHGIRL	The pain of doing my Psych assignments as a Math Student. ☹
SANDWICH EXPERT	I feel the need to answer with "sandwiches." Either that or why you should go vegan.
INA WANG (MATHSOC PRESIDENT)	The importance of MathSoc and all the ways we can advocate for you. (and all the amazing pi[es] that you should try)
A MATHEMATICAL PSYCHIC AND ASTROLOGER	Making weekly horoscopes
CLARIFIED	Reviewing 1980s adventure games from Sierra Entertainment.
GOD ⚡ PEED	Shitty jokes, probably.

ARTICLE OF THE ISSUE

The Article of the Issue for this week goes to CC, for [Modern Problems Require Modern Solutions: Learn as a Dating Site](#). It's a wonderful companion piece to [Not Unless You Like to Date Courses: Quest as a Dating Site](#) from the last issue, which you should give a read as well! CC, an article like yours is truly ~~priceless~~ priceless in the unprecedented times we live in.

Time to finally meet the love of my life!

CLARA XI, **mathNEWS** EDITOR FOR SPRING 2020
ALONG WITH JAIME ANDERSON, JOSH RAMPERSAD, AND KEVIN TRIEU

mathASKS 143.3

FEATURING PROFESSOR NOMAIR NAEEM

CC: FROM YOUR WEBSITE: IN SIMPLE TERMS, WHAT IS A "FLOW-SENSITIVE, CONTEXT-SENSITIVE INTER-PROCEDURAL ANALYSIS USING THE IFDS ALGORITHM TO REDUCE THE RUNTIME OVERHEAD OF TRACEMATCHES BY REMOVING UNNECESSARY RUNTIME MONITORING INSTRUMENTATIONS WHENEVER THE ANALYSIS WAS ABLE TO STATICALLY VERIFY THAT THE SAFETY PROPERTY WAS NOT VIOLATED?"

That WAS in simple terms! I am rusty on this but here goes: runtime monitoring is the idea to check program behaviour while the program is running. For example, valgrind does runtime monitoring. This slows down the program (CS246/CS241 students might recall Marmoset timeouts!). A static analysis gathers information about the program by analyzing it without running it. The idea is that if you can prove that something is (or is not) going to happen without running the program, there is no need to monitor that behaviour at runtime. How well a static analysis performs depends on how much information it gathers. Flow-sensitivity and context-sensitivity are techniques that (in many cases) can increase the power of static analyses (as opposed to their insensitive counterparts). Flow-sensitivity takes the order of instructions into account while context-sensitivity does not merge information from multiple callsites. So, putting this all together, I wrote an analysis that could be used to determine the presence (or absence) of certain program behaviour without running the program so that checking that at runtime was no longer needed. Simpler but not concise.

ROYAL NO.69 MILK TEA: WHAT IS YOUR FAVOURITE COURSE TO TEACH, AND WHY IS IT CS241?

Hahaha you got it. I teach only a handful of courses; CS136, CS246, CS241, CS444 and that one time when I taught CS 744. To be honest, I enjoy teaching all of them. My one issue with CS136 is that I have to use slides (which if you know me, you know I dislike). But, without slides, I am not able to maintain pace with other instructors. I do enjoy teaching CS246, especially the later part of the course. However, CS246 is a lot of work for the instructor, especially if they are not reusing assignments. CS241 is awesome to teach because assignments are stable. Plus, marks in CS241 are higher than CS246 which means I am dealing with happier students. Also, CS241 is one of the first courses where we are not creating silly impractical programs. It also has a nice mix of formal languages from a theoretical perspective and its applicability in writing language tools.

THE EUROBEAT-'EM-UP: WHAT'S THE RISCIST THING YOU'VE EVER DONE? WHAT'S THE CISCIST?

Okay I get RISCY so I will answer that. I am not much of a risk taker. I did my fair share of stupid sh*t when I was a teenager; one that comes to mind was secretly taking my older sister's car out, without a license, and then proceeding to drive 100 over the speed limit in a car that had no seat belts.

GOD ⚡ PEED: NICHE C++ QUESTION: WHEN DO YOU THINK MODULES WILL BECOME ACCEPTED ENOUGH TO MAKE IT INTO COURSE MATERIAL?

If they catch on (which I think they will), not before 2024. But, I am not the course maintainer for CS246. While using modules would simplify a few things (no need to discuss details of the preprocessor just so that we can talk about include guards) we would still need to discuss how export works and separate compilation. One thing to remember is that as soon as we switch to C++20, you could technically use anything in that version in A5. But CS246 is NOT about teaching C++ even though it often feels that way. It is meant to be a course on Object Oriented Programming. I would much rather not introduce anything that increases the time spent on C++ minutiae and rather add more OO stuff. It is for this reason that I am looking forward to the CS136 Lab component which would allow us to eliminate bash and perhaps some separate compilation stuff from CS246.

CIX: DO YOU STILL GARDEN? WHAT ARE YOUR FAVOURITE FLOWERS?

I do! Four years ago we moved to a house with huge back and front yards. It has been a challenge to keep the weeds away. With young kids it has been hard to find time to garden which used to be my ME time. You would think that with the current stay at home orders I would get more time but that hasn't happened (this term has been busier than ever and its only week 6!). I never had the chance to grow vegetables this year which makes me sad. I have been slowly planting new flowers in what were previously neglected flower beds. My current favourite are Clematis and they are in full bloom as I write this. I do also like irises, roses, hydrangeas, peonies (also in full bloom right now)... oh there are so many.

BOLDBLAZER: WOULD THERE HAVE BEEN A MORE ADVANCED FUTURISTIC SOCIETY TODAY IF PROGRAMMING LANGUAGES CONTINUED NAMING THEMSELVES AFTER LETTERS AND THAT THERE WAS A FULL SET OF THEM FROM A-Z?

Advancements in technology are incredible already. I don't know how much effect a large set of programming languages (that too naming themselves after letters) would have on this. Do we really NEED these many languages (add appropriate quip regarding the language/program used in the lunar landing computer). I mean yeah they are cool and do some things better than others, but does that mean we can advance faster. I would much rather society focus on things that we are lagging in; how about eliminating racism? That is still a thing! How about everyone earning a living wage? How about not killing each other? An advanced futuristic society where humans have learned to live like humans and not the cruellest of all animals, would be nice. If programming languages can help with that, sign me up!

CLARIFIED: YOU KNOW HOW TO BARBECUE A MEAN BURGER. WHAT'S YOUR SECRET?

Dont take this the wrong way, but University food has lowered your standards. Those were cheap Walmart/Costco burgers I grilled. The secret to a good burger, or any meat for that matter, is to not overcook it. Burgers are best grilled at medium heat. You need to bond with your grill and know how it behaves. Also, wait till you have my grilled chicken marinated in Pakistani Tikka spices!

GEORGE LAMBROU: WHAT MAKES SPECIALIZED MACHINE LEARNING CPUS/CO-PROCESSORS MORE EFFECTIVE THAN A STANDARD GPU OR CPU?

I have absolutely no clue. I never got on the machine learning bandwagon. All I know is that GPUs are what makes my video games look better. But even there, I am stuck with the games from the 80s and 90s. Brood Wars is my all time favourite even though I am not great at it.

TENDSTOFORTYTWO: WHAT'S THE MOST MEMORABLE QUESTION A STUDENT HAS ASKED YOU IN A CLASS?

This is harder than it should be. Does "Can I go to the washroom?" count?

And no, it was not asked during an exam, it was during a lecture, CS136. And yes, they used "Can", not "May". Other memorable questions include "Will this be on the exam?", "Have you gained weight?", and "If you are from Pakistan, how come your English is so good?".

BOLDBLAZER: YOU MUST REMOVE A FEATURE FROM YOUR FAVOURITE PROGRAMMING LANGUAGE. WHICH ONE DO YOU SACRIFICE?

The question makes me think it is supposed to be a feature I like but I would be willing to live without. Instead, I will answer with a feature that is there but no one really wants; I could certainly do without the ability to assign a value in a condition. Seriously, how many hours have we wasted only to find code that looks like this:

```
if (a = b) doSomething;
```

CLARIFIED: IF YOU FOUND \$1000 ON THE GROUND TOMORROW, WHAT WOULD YOU BUY WITH IT? (IT HAS TO BE A PERSONAL PURCHASE, IT CAN'T BE FOR A CHARITABLE CAUSE OR FOR BILLS OR SIMILAR.)

I just went through my Amazon wishlist:

- Raspberry Pi 4 full kit (\$150)
- Gaggia Classic Pro (\$600)
- Landscaping lights (\$100)
- A decent IP surveillance camera (\$150)
- If it were a grand in USDs: Synology NAS (approx \$500)

BJARNE STROUSTRUP: WHAT IS YOUR FAVOURITE C++ FEATURE?

Is there anything that is only specific to C++? I spent some time thinking about this and the next question and I think I like C++ because it is the most familiar to me. I am sure I could learn to love Python which might actually happen since it is everywhere! My favourite C++ feature: instead of a feature I choose RAII, the ability to wrap resources within stack objects so as we do not have to worry about releasing said resources. It really does change how you write code in C++.

SANDWICH EXPERT: WHAT IS THE BEST PROGRAMMING LANGUAGE?

This feels like a trap. I will answer with the cliched response that different problems/domains have different "best" programming languages. But in all seriousness, this question often gets answered based on the person's knowledge of the languages they know. For a person with a PhD in programming languages, I know a shockingly small number of languages; there is C and C++, older versions of Java, Scala, and that is it, really. See, I do not even consider myself to know enough about languages such as Python, Kotlin, Rust, Go etc. All of which are super interesting and useful in many domains. Based on this, I have no right to decide what the best programming language is. That stands true for a lot of us. But, of all the small number of languages that I do know, I do enjoy writing C++ code mostly because of the wonderful traps it lays for the unsuspecting programmer. The most frustrating language for sure is JavaScript!

N OBSERVATIONS OF WORKING FROM HOME

- The commute time has been shortened from getting squished on the TTC for over an hour to getting up from your bed and making your way to the desk
- Waking up in the morning to log in just in time for your start time... Only to go back to sleep for another five minutes
- Dress pants (and most of the time dress shirts too) are optional, t-shirts and sweatpants are mandatory
- You will encounter at least one kid screaming in the background of your conference call with your colleague
- You have not yet met any of your coworkers in person
- You can get up and stretch for fifteen minutes and no one will judge you
- "We are currently transitioning from Skype for Business to MS Teams"
- Coffee chats has become a Bring Your Own Coffee and chat via Teams event

ONLINE EDUCATION DURING A PANDEMIC

profTHOUGHTS 143.3

I preface this by saying that I am no expert on online teaching. Below are my thoughts (this is **profTHOUGHTS** after all) based on fairly superficial knowledge and with no research. My intent was to pen my experience as I designed and taught my first online course. I do not intend to derive conclusions. My hope is that this acts as food for thought for students and instructors alike as we plan for an increasingly likely online Fall term during these strange times.

While online teaching had been slowly becoming a thing, before the current pandemic, our University offered a small number of courses online (CS only offered CS 100). This obviously all changed in Spring 2020. The University took great pride in offering a boatload of online courses. And rightly so. Its no easy feat to bring such a large and varied number of courses online on such short notice. The instructors and supporting staff really do deserve the appreciation they have received. Could the courses be designed better? Of course! There is always room for improvement, especially when instructors had a month at best to redesign their courses.

SYNCHRONOUS VS. ASYNCHRONOUS

In Spring 2020, I chose to teach asynchronously. This meant, other than office hours, course material was available online to be consumed at a time of the student's choosing. I created detailed course notes; not slides, but prose with a few videos for when we felt it necessary to illustrate particularly tricky concepts or where animations worked better than text. Others chose to mimic lectures more closely; screen captures of slides with a narration accompanying the slides were popular.

My reasoning for going asynchronous was based around the University guidelines requiring that students with limited internet access should not be at a disadvantage. This suited me just fine for a more selfish reason; with two young boys at home it was going to be hard to schedule "quiet" time. I certainly did not want to find myself going viral like the "BBC dad." It does bring up the question whether students should be taking online courses if they cannot reliably get online. In a non-pandemic situation, I would think an expectation of reliable internet is reasonable. Similarly, in a non-pandemic term, my kids would be in school, and I would have the flexibility to teach synchronously if I wanted.

Synchronous teaching, where there is a live session of some sort, does have benefits. It provides an opportunity for more interactivity. Students can ask questions right away rather than emailing/posting questions and waiting for a response which certainly breaks momentum. Also, recordings of live lectures can be made available to students who did not attend which supports asynchronous access to content (though it does not mitigate poor internet connectivity). The bigger advantage of synchronous teaching is that of a connection between the instructor and students. I have certainly missed

that connection and maybe students miss it too; I am dying to make corny jokes but no one's there to listen.

The jury is still out on whether my decision to use course notes instead of lecture-style recordings was/is a good idea. I am making students read a lot! This demands a more active participation when compared to watching videos. In a survey of my current students (conducted in week 5 of Spring 2020), some students commented that they found it hard to focus and that it took a long time to read notes. I hear ya! A good set of course notes is only useful if the students actually read them. On the flip side, some students praised the notes and the approach. Given a lot more time, we could have the best of both worlds; a solid set of notes to act as a reference and videos that go over those notes.

STUDENT MENTAL HEALTH AND WORKLOAD

When I was first approached by **mathNEWS**, I planned to write about student mental health. In the last few years, there has been increased attention to mental health concerns and providing resources to students, often due to deeply disturbing incidents. I worry that the pandemic might have worsened the situation. However, I find myself unqualified to give much advice.

I have tried to put myself in my students' shoes and visualize what their days look like. Apart from the obvious concerns of the pandemic, some students found themselves stuck away from their homes; likely living alone, social gatherings disallowed. That must be extremely isolating. I worry for such students. You should too. If you know of such a friend, contact them just to say hi. If you are a student who feels isolated, please reach out to your friends and family.

The online transition has been tough for most. Many students chose to take their normal course load. Adding to it the load of learning new ways to learn, I worry that students will be overwhelmed. We already have classes that are large enough that instructors cannot track students who might be struggling. With the added burden of online teaching, more struggling students might go unnoticed. My personal opinion is that you should talk to your academic advisor if you have too much on your plate. A reduced work-load, in a term with a raging pandemic, is not a bad idea. No one will judge you for it. Your academic advisor can help you decide which course (if any) to drop and how to deal with the different demands on you.

QUALITY OF LEARNING

I do not plan to do down the rabbit hole of how we measure quality of learning. Many already consider our pre-pandemic means of assessing students' capabilities as broken. What I have been thinking about is whether online teaching/learning is better or at least of the same quality as an in-class offering of the course.

The quality of online learning depends on variables such as the type of course, the type of delivery mechanisms, the effort put in by course staff and the effort put in by the students. But how do we measure what better is? Is it less hiccups like servers not crashing on us (true story!) or is it that students actually achieved the course objectives? How do you measure this when assessment results might be unreliable (see below)? Can we just assume that if students find it at least as easy to go through a course as an in-class offering they must be learning at least as much? Instructors could solicit feedback by running their own surveys asking open-ended questions such as which technology students prefer and why? However, these still do not answer the question “Did students actually learn as well as they would have previously?”. I have no answers. I would like some.

ACADEMIC INTEGRITY

Some students cheat. There is no escaping that. Instructors and institutions put in place safeguards to prevent cheating. Automated plagiarism detection software helps to some extent but is not foolproof. I like to believe that in-person exams were one place where we had a guarantee that what the student wrote was their own work (who knows, maybe some of you are laughing at this because you have found ways around the draconian rules we have; no hats or hoodies during exams!). We have already heard of new rules popping up at other Universities: 360 degree view while writing an exam! With online courses, I am resigned to the fact that more cheating will happen. This makes me uncomfortable.

During Spring 2020, I tried to make cheating on exams less “worth it” by significantly reducing the grade you can earn on an exam. Additionally, we are creating multiple versions of questions and randomly assigning students to different versions. This made creating exams time consuming; for an exam with 9 questions, and 3 versions per question, we had to maintain 27 different specifications, solutions and marking schemes. As I write this, I have spent 3 weeks on just creating Exam 1. There are 3 more to go. Will it be worth it? Probably not. Will I know if students cheated? Probably not. Is there a better solution? I hope so.

TUITION FEE

On social media, I saw a big hoo-ha that since Universities are teaching online they should reduce their fees. First, let me say that ideally, education (at any level) should be free for a country's citizens. That is not happening any time soon. The University does have significant costs and those costs do not go away with a term or two of online teaching. Yes, the University is likely spending less on utilities and things like toilet paper! That reduction in expenditures is likely peanuts compared to things like salaries. Should faculty salaries be reduced then? For self preservation, I would certainly hope not. I am sure I speak for the majority of faculty teaching this term that we are spending more time on our courses than we ever have. But that leads to this: what about future terms? Once the online material is ready, the University could just reduce their faculty? The question is that once these

online courses have been developed, is there an opportunity for the University to reduce costs by increasing the student to instructor ratio? In my limited experience, teaching effectively online requires more work from course staff than teaching in an in-class setting. As an instructor, asynchronous teaching saves me roughly 3 hours each week (no lectures to give). But then I have to answer a lot more emails and posts and hold more office hours since it takes longer to write stuff than to just say it. All that said, please don't fire me!

WHEN THINGS GO BACK TO NORMAL

When things go back to normal, whatever that means, I do see one potential in how I teach CS courses. In teaching pedagogy, one interesting teaching style is the flipped classroom. The idea is that students are introduced to new material at home through assigned readings or videos. During scheduled lecture hours, the instructor assumes that the students have done their work and uses other techniques such as group discussions, interactive exercises, more examples and live coding for a deeper learning. I would love to experiment with this. I haven't so far because the upfront effort to create the assigned material was always too much. But now I have the material ready (or at least I will for one course once Spring 2020 is over).

To end, the last few months have been trying times for all of us. The term is nowhere close to done but I find myself exhausted. Many of your instructors are likely in the same situation. But the stakes are even higher for you, as students. You have needed to adapt really fast to a different learning paradigm. I have no pearls of wisdom for you other than keep trying your best like you always have. Lean on your friends and families; lean on your instructors and academic advisors. One day soon, we will be back in the familiar halls of DC and MC with stories to share of where we were and what we were doing during the pandemic of 2020.

Prof. Nomair Naeem

VOTE IN THE MATHSOC ELECTIONS

Hi Mathies! During this unprecedented time, the student government needs your engagement as we prepare for upcoming changes in policies and academic procedures. The vote for President and VPA of MathSoc opens on July 2nd. Please engage with your candidates and cast your vote at vote.wusa.ca!

MathSoc Elections Committee



MAKE MY JOB DIFFICULT!

Hi all! For those who don't know me, my name is Yuqian (Ina) Wang and I am your Spring 2020 MathSoc President. My role as the MathSoc President is to be the representative of MathSoc to external groups such as the Math Faculty, WUSA, and the University as a whole. Part of that job is to advocate about matters that concern you, undergraduate Math students.

Recently, MathSoc has been continuously advocating against the use of Online Proctoring, after a student brought their security concerns to the MathSoc council. If they hadn't, we wouldn't know about it. Our meeting instead would have been boring as we discussed internal policies (to some, those policies are actually fun). We are here to support you and advocate for you to the University. To do that, we need to hear your voices. This is the prime time for action and impact.

In other words, I am asking you to make my job difficult. Send me and Alan emails (prez@mathsoc.uwaterloo.ca; vpa@mathsoc.uwaterloo.ca; advocacy@mathsoc.uwaterloo.ca) with your concerns and feedback. Flood our inboxes, so we can discuss real and meaningful matters with our Council, WUSA, and the Faculty. Nothing is too small nor too big. A thousand upvotes for rants and concerns on Reddit is significant, but a few personal emails will drive a whole council meeting.

Best wishes and luck!

Yuqian (Ina) Wang
MathSoc President, Spring 2020

P.S. If you don't feel comfortable emailing to us, you can anonymously feel out this feedback form: bit.ly/MathSocFeedback.

MILKING EVEN MORE CONTENT OUT OF A THIRST ARTICLE

When I impulsively wrote my thirst article two issues ago after hastily downing three (diet) beers and joining mathNEWS, I could never have expected someone to actually put in the work and answer my query of using Quest as a dating site. CC, you have shown me more effort than my last three relationships combined. Holy, you even had citations??

Your argument got me thinking; maybe Quest isn't the only option — mathNEWS is free and it's always available! So... Seeing as I fall in love with anyone who notices my existence (don't judge me, it's cuffing season), I know a pretty great Olive Garden downtown, whaddaya say? ;)

A cool pen name

N MORE SEQUENCES FROM THE OEIS THAT CONTAIN 1312

- A000027
- A022443
- A022948
- A023606
- A036111
- A036113
- A091329
- A095626
- A095627
- A095764
- A131835
- A182271
- A201055
- A205193*
- A222619**
- A253025*
- A265948
- A267212
- A270183
- A270212
- A270306
- A271262
- A271627
- A273307
- A273849
- A305885
- A309516
- A322834
- A323139

Dishonourable mention: A239378

boldblazer

*Contains multiple 1312's

**RIP John Conway

EPISODE FOUR

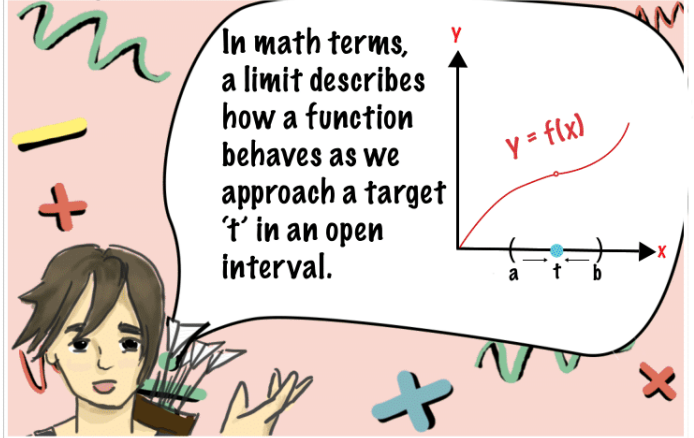
On the next page, enjoy episode four of MathSoc's educational cartoons series: MATH 137. ϵ - δ Definition of a Limit! This cartoon attempts to break down the definition with an archery analogy. If you have any feedback please email Gavin Orok at gjorok@uwaterloo.ca or fill out the following survey: https://bit.ly/cartoon_feedback.

For each unique educational cartoon we produce that you give feedback on through this survey, your name will be entered in a draw. At the end of the term one person from this draw will be chosen to win a \$25 gift card prize!

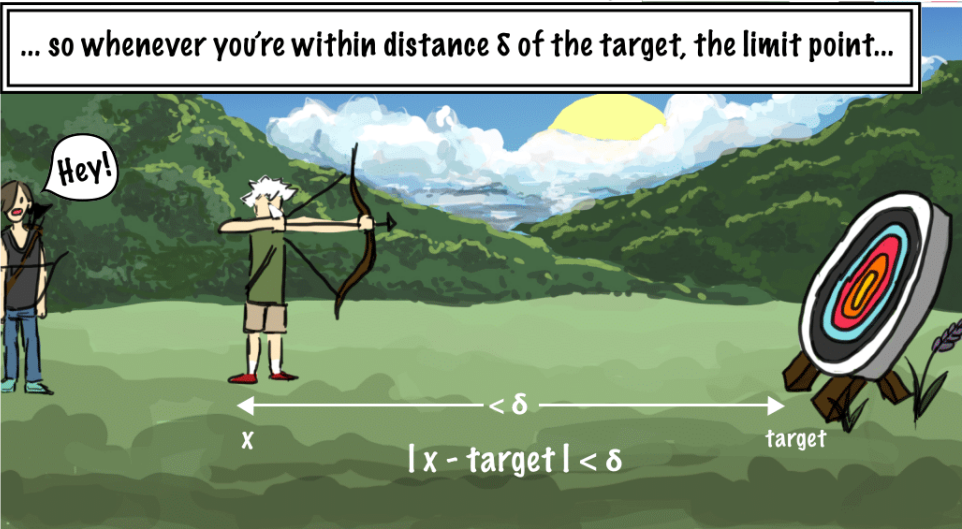
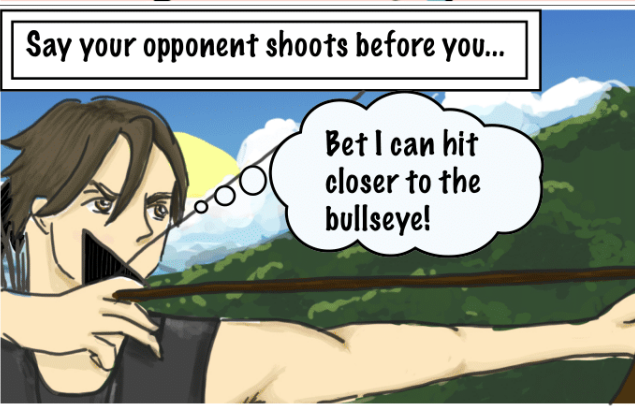
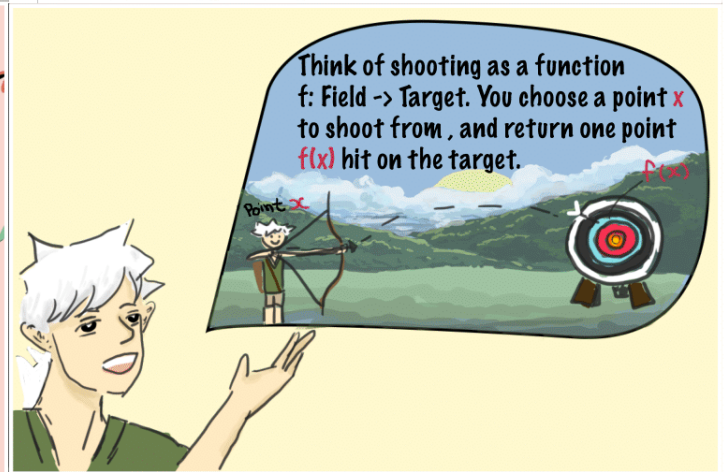
Gavin Orok

Math 137: ϵ - δ Definition of a Limit

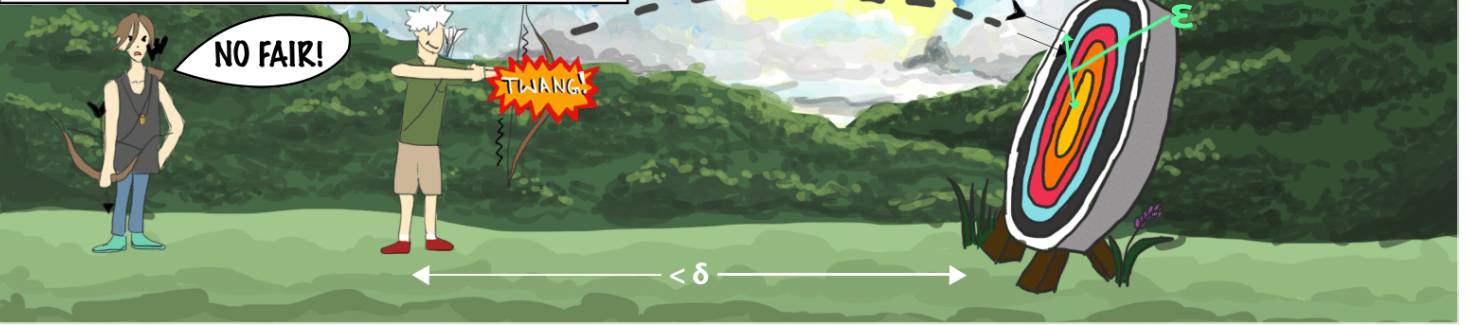
Idea by: Laidon Burnett | Story by: MathSoc | Art by: Alvina Cheng (@etanearth)



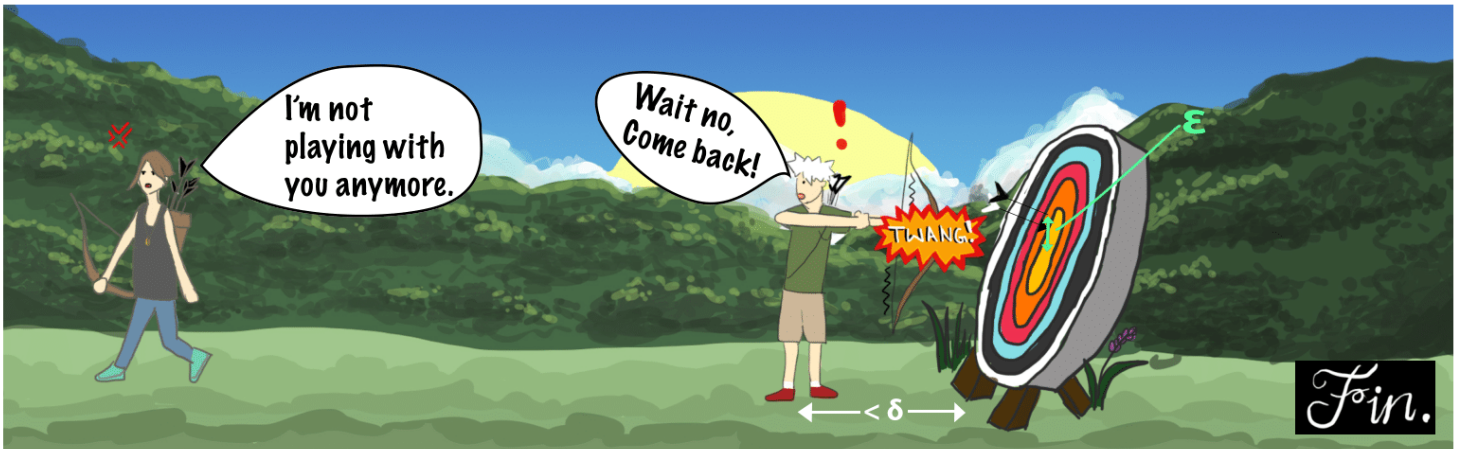
Recall the math definition of a limit:
 Let $f: D \rightarrow \mathbb{R}$ be a function where there is an open interval $I: a \neq I \subseteq D$. Let $L \in \mathbb{R}$. We say the limit at the limit point $t \in I$ exists and equals L if for all $\epsilon > 0$ there is $\delta > 0$ so whenever $x \in I$ and $|x - t| < \delta$ we have $|f(x) - L| < \epsilon$.



This trick must work for any positive distance your opponent hits from the bullseye.



The closer your opponent's shot, the closer you must move in.



MY FIRST CO-OP PASTA: A RECIPE FOR THOSE GETTING STARTED WITH LIVING ALONE

So here I was, a student of computer science on my first co-op, finally deciding to shift out of oh-so-expensive residence and grab a place with one of the lovely landlords of our city, [redacted]. The good thing was that I had unlocked the Kitchen, a useful area in my new apartment that enabled me to cook whatever I want to eat, whenever I want it, provided I have the right ingredients and time. The bad thing was that I needed to use the Kitchen whenever I needed to feed myself. Well, myself and my roommates, since we decided to split among the three of us the jobs of making lunch, making dinner, and doing the dishes. The problem was, that while I'm passable at doing dishes (thanks Mom!), I had no clue how to turn bread and onion into food. After some troubleshooting, trial and error, and silently cursing online recipe blogs for just going *on and on and on* with their own life story rather than just giving me the bloody recipe, I finally designed the perfect food: it uses just the right mix of pre-made and home-cooked ingredients, it's really easy and cheap to make, and it can kinda sorta pass as healthy if you don't look too close. I present to you, My First Co-op Pasta.

MATERIALS REQUIRED (SERVES THREE, DIVIDE EVERYTHING BY 3 OR 2 FOR ONE PERSON, WHICHEVER IS THE MORE CONVENIENT DIVISOR)

- 400–450g of pasta (penne and spaghetti work well, others not tested)
- 4–8oz of any red-colored pasta sauce *other than* tomato and basil (we make our own “tomato” flavoring here—“Four Cheese” and “Spicy Red Pepper” sauces work well)
- 1 tablespoon salt
- 2 whole tomatoes, kinda large
- 1–2 cups of any and all vegetables and meat that you think would taste good in pasta (corn, olives, chopped carrots, mushrooms, and already-cooked chicken work well)
- 2–3 tablespoons of olive oil
- Lots of water
- (optional) 1 tablespoon of butter
- (optional) 1 tablespoon of ginger-garlic paste (you can even use actual ginger and garlic if you know how)
- (optional) Pizza seasoning to taste

APPARATUS REQUIRED (DO NOT DIVIDE FURTHER)

- One big pot
- One big pan
- One colander (or as I like to call it, bowl-with-a-hole)
- One knife and cutting board
- One spatula

PROCEDURE

1. In a large pot, put in your two tomatoes, and enough water that they are completely submerged (or at least floating). Put this on the stove at full heat, and let the water come to a boil, keeping the pot uncovered.
2. While the water is heating up, cut any of the vegetables you might have picked that require cutting. Now, put the pan on the stove next to the pot, on medium-high heat, and add your oil to it, and if you're using ginger-garlic paste, that too. Once the oil starts developing bubbles or making concerning hissing noises, throw in the vegetables and mix them well with your spatula, trying your best to coat them completely with oil and ginger-garlic.
3. When the tomato water is boiling, turn the stove below the pot off, and the stove below the pan to the lowest possible setting. Now drain the water and bring your tomatoes to the cutting board. Fill the pot with however much water the back of your pasta packet says, and add the salt to it. Start boiling it uncovered again, but this time only at medium-high heat.
4. Cut the tomatoes the best you can into pieces approximately an inch squared in size. You will realize that the tomato is extremely squelchy and basically kinda releases all the juice onto the cutting board. This is normal, try to keep the juice on the cutting board as much as you can. If the skin of the tomato comes off at this point, cut it into one inch squared pieces as well.
5. Pour the tomatoes and the juice straight from the cutting board into the vegetable pan. Mix it well, then turn the heat up to medium-low. Add the pasta sauce, and the butter and pizza seasoning. Keep stirring this until the pasta water begins to boil.
6. Bring the sauce mix to the lowest-possible-heat again, and add the pasta to the water. Let it boil for however long it says on the packet (it's different for every pasta), then pull one of the pasta things out and taste it. If it's rubbery and bouncy, let it cook for another minute and try again. If it feels like pasta in your mouth, you're good to go.
7. Drain the pasta into the colander. Some people online say that you should keep some of the pasta water, add it to your sauce, or something like that. I've had terrible experiences with that, but feel free to try. Immediately after draining, empty the colander right into the sauce mix.
8. Mix the pasta really well, until all of the pasta has a uniform red tinge. Make sure there are no areas redder than others. If at this point you feel like you need more pizza seasoning, feel free to add it.

And you're done!

CONCLUSION

If all goes well (and you're a quick eater like me), you can cook and eat this entire thing in about 30–45 minutes, basically the size of a co-op lunch break. This recipe is easy, pretty cheap to make, really filling, and tasty as well. And since it's basically carbs and veggies (ignore the oil and butter thanks), it should be pretty healthy as well! It can get a little repetitive to have this every day, so I suggest you learn a couple of other things too, but if you're new to cooking like me, it's something really nice you can make for yourself with not much effort.

FURTHER RESEARCH

Once you have this basic recipe down, you can try to be adventurous—the pasta water thing, if you want to go through the same hell I did, or you can try to add other spices and sauces. I know Kashmiri lal mirch (a form of *really spicy* red chili from India) works really well with it in small amounts, and I've had good experiences sprinkling a little Parmesan cheese on top to make everything more gooey and fun.

Good luck, and happy eating!

tendstofortytwo

CHARLIE CHU'S STAR WARS LIGHTSABER DUEL SHORT FILM

In this article I'll be giving some of my thoughts on Charlie Chu's hotly anticipated 2014 indie release, *Star Wars Lightsaber Duel Short Firm (Sith vs Jedi)*, released under UNSC Zyrok Film, d.b.a. Zyrok Productions. Many of you readers at home likely recognize Mr. Chu from his widely-renowned first-year blog, posted entirely on LEARN.

This particular release was certainly one of the more polarizing and controversial of Zyrok Productions' releases over the years. A precursor to Zyrok's revered *Northern Base Adventures: Polaki* franchise, this film was more experimental in nature, and has thus far drawn some varied critique. Here are some quotes:

“It's just so outrageously underwhelming”—god ⚡ peED

“Props to the stunt director!”—Deriving for Dick

Mr. Chu was generous enough to upload the full release onto YouTube for all to see, free of charge. Here's a link in case you haven't seen it: <https://youtu.be/fGcCT6duxHw>

For me, this short film was quite the rollercoaster. Both emotionally, and in my opinion of the film. A very short rollercoaster, at that. The film opens in red text: “Darth Vader vs Jedi Knight”. In Chu's familiar direct style, he lays his cards right on the table and makes it plain what we're about to see. Perhaps a signal for the faint of heart to brace themselves? I digress.

The battle opens with a striking soundtrack by Kevin MacLeod, and a tense, tight shot capturing only the silhouettes of these ill-fated fighters, lit only by the dim radiance of their sabers swinging to and fro. It builds a great deal of suspense, to say the least. And then... the credits roll? What—? What happened? Did I fast-forward? No, it's

over. Excellent setup and development, only for Chu to immediately leave us all waiting for more. Hardly a tease. If not for the length issue, I'd be inclined to call this quite the masterpiece. Really quite a shame. I suppose he was trying to sink more budget into the upcoming *Northern Base Adventures: Polaki* pilot, which clearly paid off. Definitely looking forward to a potential sequel, however.

Join me next week when I discuss another controversial, more recent film from Zyrok under Charlie Chu: *Restaurant Reviews 1*.

jeff

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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HOW TO STALK PEOPLE: A GUIDE

Does... Does this really need an introduction? The title's self-explanatory, you're a smart autonomous individual who's already reading this, and I'm certainly not judging. I think we have a mutual understanding.

With the creation of the Internet, social media and phones, the stalking community has largely moved its platform online. And why not? Ease of use and a much more efficient use of your time are great reasons why stalking from home could be the right option for you. Instead of having to follow your ex for weeks and embarrass yourself with that unattractive stalker "sunglasses-and-black-hoodie" get-up in public, you can deduce their relationship status from the comfort of your bed.

First thing you need to do, if this is a stranger that you desperately need to find (like the fucking Alabama kid who keeps beating me in Skribbl.io), is gather all of the information you have available about your target—uh, I mean, "the person of interest." So crack open an Excel sheet—or Numbers for all you Apple elitists—and list their name, school, country, city, persons they are associated with, what their hair smells like, etc.

If you have their name, great! That's half the job done. Let's just punch that name into Google and do a quick search... If you find a LinkedIn and this was a potential love interest, just stop. You have better standards than that.

Social media is your next step. If the name is rare enough, you're in luck. Instagram and Facebook will regurgitate their profile fast enough. "Oh bUT wHaT iF tHEy'Re nOt a sOCiaL mEdiA pErSoN?" I hear you thinking. Come on, that's bullshit—literally even dogs have social media accounts. Aw, look how cute.

If their name is a little more common, say, Charlie Chu (just as a random example), then you better crack your knuckles because we're going to have to get our hands dirty. You can search through the follower lists of any people you know your target is associated with to get to your goal. One of Chu's frequent actors is Jack Vodov, so you can get to our guy through him, which is pretty easy because who the duck has a palindrome last name?

Basically, we're creating a tree of public accounts and hopping about random strangers' profiles to find a different, more specific random stranger. Theoretically, you should be able to find anyone through six accounts. Fun fact, since you and I are pretty intimately acquainted at this point, you now know Putin through three people (yes, my family has connections). Which by extension means you know the Queen. I think that justifies sending ol' Lizzie an email invitation to your Zoom wedding.

If you are conducting your stalking in person, bravo! Chivalry isn't dead. Fortunately for me, Wikihow has already done extensive research on how to best go about this activity. Interestingly, their article "How to Stalk Someone Stealthily

Outdoors" has been viewed 109,954 times since April. And yes, there's pictures! Hey, if you don't go in an incognito window you'll get to personally experience the discomfort of knowing that Google makes billions of dollars stalking what people like you do online to sell your data to Burger King and Jysk advertisers. Nothing like some meta creepiness to make you reevaluate your life choices.

Ah shit, it's time for me to go. I fear that the CRA will be auditing me soon for lying on my CESB application, and if they start poking around, I'm not sure they'll like what they'll find. Call me Lemony Snicket because it's time for me to go off the grid and on the run. Goodbye, Beatrice.

A cool pen name

"How to Stalk Someone Stealthily Outdoors." *wikiHow*. 15 Apr. 2020.
<www.wikihow.com/Stalk-Someone-Stealthily-Outdoors>.

MR. GOOSE, MR. GOOSE...

How's your summer going?
I hear campus is pretty,
But there's no way of knowing.

Mr. Goose, Mr. Goose,
How do you handle heat?
You're braver than I,
Inside's where I retreat.

Mr. Goose, Mr. Goose,
Oh how I've missed thee,
Avoiding your shit,
On the way to MC.
Mr. Goose, Mr. Goose,
Please give me a sign,
That Fall is the last term,
My courseload's online.

Mr. Goose, Mr. Goose,
Soon I'll return too,
You'll honk and I'll smile,
How I miss Waterloo.

Deriving for Dick

**I read mathNEWS
devoutly.**

PROF. STEVE FURINO

LA GRIPPE

Because of the whole virus thing and all, I'm back in BC with my high-school-aged sister. Actually, she's not my sister. She's going to be my sister-in-law when I finally get to marry the love of my life. She's in eighth grade, and she's doing stellar. She's taking the four Honours classes (Math, English, Social Studies, and Science) and she's getting straight A's. I hear she's also great at competition-style karate. Anyway, because of the whole virus thing and all, **they're having high school online now**. The teachers have once-a-week, hour-long live lectures. I've been sitting in on them. I guess because it's been a couple of years, I've forgotten what it's like to know the names of everyone in a class. We judge the classmates who have memes as their profile pictures on Microsoft Teams. Among others, there's **Dio, Spongebob, and Mugi** who participate in discussion more than anyone else. And the teachers are always trying to get other students to speak instead. Her science teacher is getting laid off this year despite having seniority because of some clause involving part-time work. **Everyone loved that teacher**. I didn't, because I never took Science 8 Honours, but I mean, I could always see how students would hang out in the science classroom during lunch-times. **Everyone's all broken up about it**. I mean everyone my age. I heard from a third party who also heard it from a third party that the teacher is currently numb and depressed due to this, but I don't think my sister knows. Why would she? It's not like anyone needs to tell the eighth-graders. They're not attached yet. The only reason that I even know about this is that the Math Honours teachers leaked the information to the twelfth-graders who leaked the information to the alumni. I had to sign a card and everything, even though I have no relationship with that teacher. I was basically guilty into it by this girl two years younger than me who used to read my blog and come up to me in the hallways and tell me how much she liked my blog. **I don't even know how I know her**. I'd wager it's something like she was a friend of a friend, classmate of a classmate, fellow math-contest-go-er. So I'm watching this numb and depressed teacher teach my sister about DNA and ribosomes and other things like that. I don't even know these things, because now that I think about it, I went from Science 8 to Science 10 Honours so I skipped all of Science 9. I'm learning. It's just basic biology but fuck shit and damn, I don't know anything outside of math. **It's mid-May, and BC is reopening**: retail, restaurants, and yes, schools. Sort-of. The plan is to let high school students go to school once a week, for an hour. If this sounds dumb as hell to you, don't worry. The high school students think so, too. But it's optional; it's only meant for students who are completely lost in their lessons. Like I said, my sister is doing stellar. Her time is scheduled for Thursdays and Fridays, alternating weeks, in the morning, but of course she's not going. As we eat dinner, her mom who is not my mom because my sister is not my sister, she's my future-sister-in-law remember, says that she wants my sister to go to school for the hour. Well, damn, why in the hell? We're convincing her mom that it's optional, useless, and lame. Turns out the mom just wants her to go and socialize. I get it. I and her brother, the love of my life as I say, kind of just play video games all day so we

can be a bad influence on someone with a bright future like that. "There won't be any socializing going on," my sister says, "they're just catching-up lectures," she continues, **"and if I wanted to socialize, I could just text them."** Well damn. I guess she has that ninth-grade girl who Instagram-video-calls my sister every day so she can have company while doing her ninth-grade chemistry homework. **They do chemistry in Science 9?! Fuck**, I probably thought the same thing when I was in eighth grade. When everyone in my friend group and extended friend group and then-boyfriend's friend group was only a click and text away. They were basically strangers to me, but on a regular basis I'd send them memes which were then called image macros and I could have three dumb and meaningless conversations at once. Like that girl complaining to my sister about things like balancing equations. And I don't think they've even gotten to stoich yet. **It's not the intellectual level of their conversations that bothers me**. It's been a good number of years since I have been able to do that, ever since the girl who would read my blog stopped coming up to me and talking about it and started trapping me in uncomfortable obligations instead. I used to think the internet was easy, that it was basically a direct tunnel between me and everyone else, and I could send them a jokey video like a YTP, if you remember those, with a few presses of a button or touchscreen and the convenience of that was more than enough to sustain my relationships with all of them. Socializing was socializing, I thought. Nobody wants to be at school anyway, so we might as well just talk intentionally online. **Fucking wrong, dumbass**. How are you going to send someone memes if you can't observe them from afar to determine what kind of memes they'd like.

cy

Ever wonder how much filler is in a given issue of mathNEWS?

Just count the number of items in all the "N Things" articles.

Oh, and these little blackBOXED quotes.

A mathNEWS EDITOR WHO JUST WANTS TO FINISH LAYOUT

LOOKING FOR CHARLIE

For those of you not in the know, LEARN has a blog feature. Most people have zero, or a few blog posts. Even fewer have any comments. But, among the fishes, there is a whale: Charlie Chu, with 250 posts and 11,500 comments. (admittedly mostly spam about Indian moving companies)

Charlie, for every day of first year, wrote a blog about his life and experiences. Every day he put his thoughts on LEARN for the adoring public to read, until sadly, first year ended and Charlie left Waterloo behind for greener pastures.

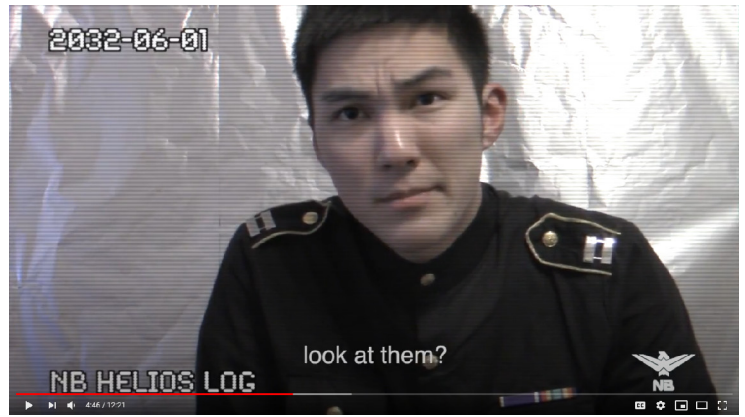
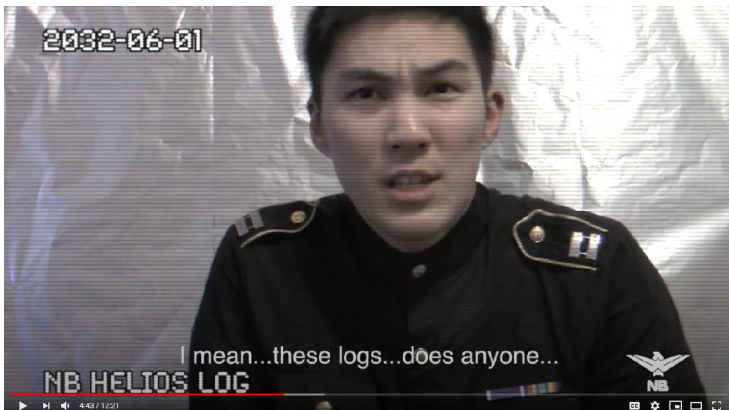
But, he left behind a lot of stuff, that I mostly skimmed and did not read. The thing that stood out the most was his YouTube channel, absolutely chock full of short films: <https://www.youtube.com/user/ZyrokUNSC>

The early films were shot on campus, and you can tell.



A MURDER TAKING PLACE IN DC. For once, not a midterm that's killing people. (<https://www.youtube.com/watch?v=WElmz7bNnHo&t=145s>)

After that, he moved on, including this film where he seems to work through his blogging on screen:



THIS HAS TO BE A REFERENCE TO HIS BLOGGING RIGHT?
(<https://youtu.be/34t08mpsgW0?t=279>)

Charlie, if you're out there, we'd love to have you here for a mathASKS.

UW Unprint

N THINGS I WANTED TO DO BUT NEVER DID SINCE QUARANTINE STARTED

- Build a raytracer
- Learn woodworking
- Learn Rust
- Learn OCaml (again)
- Hug someone
- Dig under my backyard for hidden treasure
- Dig under my neighbour's backyard for more hidden treasure
- Buy Minecraft
- Finish all the books in my reading queue
- Learn a British accent
- Learn an Aussie accent
- Learn a Klingon accent
- Write a quality article for mathNEWS

quantum goose

PRESIDENT FERIDUN HAS INVITED YOU TO LAKE COLUMBIA

There is no racism in UWaterloo.
Here we are safe.
Here we are free.

A Mathematical Psychic And Astrologer

BEING THE OFFICIAL OPPOSITION CAN SOMETIMES MEAN HAVING THE THIRD MOST SEATS

In the Westminster system of parliamentary democracy like we see in the UK, Canada, and Australia, the party with the most seats is the government, the party with the next most is the official opposition, and the others are the third parties (or other equivalent terminology). Each of the leaders respectively holds the positions of Prime Minister (or other equivalent titles), the Leader of the Official Opposition, and the leaders of the third parties which do not have official codified titles and offices. However, the system has a lot of caveats, weird rules, and traditions due to it being a result of centuries of history. One such odd quirk of history is that of the Legislative Assembly of the Northern Territory in Australia.

While a big chunk of the world was worrying about the 2016 United States presidential election, the Northern Territory had its own election to concern with. They elected 25 MPs on 27 August 2016, and the result was stunning. The Northern Territory general election results were as follows: the Labor Party won a landslide 18 seats, the County Liberal Party (CLP) fell to 2 seats, and 5 Independent MPs, including the Speaker, won the remaining seats. This was one of the worst defeats of a sitting government in Australian history.

The opposition leader Michael Gunner became the new Chief Minister, and because the former Chief Minister lost his own seat, the CLP eventually chose their new leader in Gary Higgins, now also the new Opposition Leader. The only other CLP MP, Lia Finocchiaro, became the deputy leader of the CLP. Even though the CLP did not win enough seats for official party status, and had less seats than the independents, they became the official opposition by default, being the only other party. However, that was soon to change.

In December 2018, three MPs were dismissed from the Labor caucus and became Independent MPs. The first MP resigned, leading to a by-election that was narrowly retained by Labor, the second remained an Independent but announced he would not run for re-election, and the third eventually switched their party affiliation to the Territory Alliance (TA). This changed the composition to 16 Labor, 2 CLP, 1 TA, and 6 Independent. The CLP remained the second largest party and thus remained as the official opposition.

In March 2020, 2 Independent MPs joined the Territory Alliance. That means that the TA has 3 seats, compared to the CLP's 2 seats, changing the composition of the Assembly to 16 Labor, 2 CLP, 3 TA, and 4 Independent. Therefore, they now had the claim to being the official opposition, but within a week of this event, the CLP brought out the Reverse Uno card.

CLP Leader Lia Finocchiaro¹ put forward a motion that the Assembly should decide the official opposition via secret vote. This caught pretty much everyone by surprise. The motion went through, and the result was as follows: 5 votes for the CLP, and 3 votes for the TA. Thus, despite having less seats

than the TA, the CLP became the official opposition again by a margin of two. How did this happen?

It was announced beforehand by Chief Minister Gunner that Labor would not participate in the vote. That left 8 non-Labor MPs who could vote; the Speaker does not vote except in tie-votes. Since the 3 TA MPs and 2 CLP MPs would vote for their own party, the results hinged on the remaining 3 Independents. They all sided with the CLP.

There are many possibilities as to why the 3 Independent MPs chose the CLP over the TA. Perhaps it was due to the TA having a faint hint of right-wing extremism that led the former Labor MP to vote against the TA. Perhaps the other Independents wanted the status quo of the existing two-party system. It could be that the MPs wanted to focus on the ongoing pandemic and disliked how the TA was more concentrated on its status in the Assembly. The speculation can go anywhere, but what matters in the end is that, despite having the third most seats, a party can become the Official Opposition.

The next general election is scheduled for 22 August 2020, and the opinion polling still shows that the main battle will be fiercely competitive. It's still possibly anyone's victory or perhaps another landslide or even a hung parliament, but what will be interesting is if there will finally be an undisputed Official Opposition.

boldblazer

¹Gary Higgins had stepped down from his position of CLP leader and announced his retirement by the next election.

AN INTERVIEW WITH JEFF, mathNEWS WRITER, ON ACCIDENTALLY MISSING PRODUCTION NIGHT

WOULD YOU LIKE TO GIVE ME A SMALL INTERVIEW DETAILING YOUR SORROWS?

wow, what an opportunity

absolutely

tendstofortytwo

UW LIBRARIES, RANKED

WHEREIN I RANK ALL SEVEN UW-AFFILIATED LIBRARIES BY HOW MUCH I LIKE STUDYING IN THEM.

Yes reader, I may be committing an act of self-sabotage here by giving away some of my favourite study spots, but I'm hoping that by the time you're back on campus in the next year or two, you'll completely forget about this article. I'm in a confessional mood, alright?

UNRANKED: MUSAGETES ARCHITECTURE LIBRARY, WITER LEARNING RESOURCE CENTRE

For architecture and optometry students respectively. I've never been to either, although I've gotten close—I've been to Melville Café on the Architecture campus once, and in Fall 2019 I had a class that held two lectures in the Optometry building before moving to somewhere in Modern Languages for the rest of the term. I'm sure they're nice libraries from the pictures I see online. But I'm also sure they're decently busy serving their own niche of students, so don't go in and expect a lot of unused study space. The Musagetes Library is especially far away and it's definitely not worth the trip if you're just looking for a place to study.

Now that I think of it, I wonder why the Stratford and Kitchener campuses don't have libraries...

5: DAVIS CENTRE LIBRARY

I get the appeal of this library. It's right across Phillip Street and it's next to a bunch of bus stops plus all the math buildings. The bridge that connects it to MC and M3 makes it all the more appealing in winter—Dana Porter isn't connected by bridge or tunnel to any other building, and the three University College libraries are all at least a three minute walk from Ring Road. Proximity is the Davis Centre Library's greatest strength. Understandably, it's the most popular library for Math students; in fact, it's popular to a fault.

Once midterms begin, you can expect the Davis Centre Library to be completely packed on weekdays from noon to about 6 o'clock for the rest of the term. (The upper bound of this interval grows later as the term goes on, and by final exam season, weekends are included too.) Futilely wandering through the carrels looking for a free spot, short-lived hopes deflating when you see a laptop and jacket place-holding an empty carrel, rage building when you see someone swipe an empty spot before you: these are things that we have all experienced and felt.

It's too bad that the Davis Centre Library is always busy, because its quiet/silent study section is a lot more attractive than Dana Porter's. One half of the silent study area of the Davis Centre library was revamped with some new, very nice carrels in Winter 2019. The chairs have adjustable height, the surfaces of the desks are smooth, and the light fixtures and outlets on all of them actually work. There are even some carrels with reclining-style chairs that look fun, though I've never tried them. Also, this is just a personal thing, but I

really dislike the smell of library books; Dana Porter has lot more of that smell than the Davis Centre Library. Finally, it's been my experience that the silent study section of the Davis Centre Library is actually silent most of the time. Random sounds—including but not limited to: whispering, loud music leaking out of earphones, and chewing food—occur more frequently in the Dana Porter silent study floors.

4: ST. JEROME'S UNIVERSITY LIBRARY

The lowest University College library on my list. If I'm being honest, it's probably because I haven't used St. Jerome's library much in comparison to the Lusi Wong and Milton Good libraries. To be even more honest, the reason I haven't been in the St. Jerome's library much is because it would be closed whenever I went over to check.

In Fall 2019, the St. Jerome's University Library was closed at 6:30 PM on Mondays to Thursdays, 4:30 PM on Friday, and all day on weekends. Aren't those some terrible hours? The other two University College libraries also closed early on Fridays, but at least they were open past sundown on Mondays to Thursdays. Admittedly, in Winter 2020, the St. Jerome's library had longer hours and was open on weekends, so if I was in school that term, its ranking on this list might've been a little higher.

Since I've only been to the St. Jerome's library once or twice, my memory of it is pretty fuzzy. I will say that it is the cosiest of all the UW libraries I've visited. The study carrels are all the same; they're old, but not in a beat-up, musty, Dana Porter-kind of way. They're quite narrow—even more narrow than the cedar carrels in the Peter Sims Silent Study area of Davis Centre Library—and they're made of a thick, ochre wood. The chairs are sturdy and wooden as well. The floors are carpeted and there's a spiraling staircase that descends onto the homely main floor of the library, which is decorated with plushly upholstered armchairs that are just asking you to strew across them while taking a nap.

Yet as nice as the atmosphere of St. Jerome's library is, there remains a depressing lack of windows (a fault shared by the Davis Centre library). Plus, the few times I did visit, it was always pretty busy.

3: DANA PORTER LIBRARY

You can't deny that the Dana Porter Library is iconic. It's located right in the heart of the Main Campus, its "sugarcube" shape towering over the surrounding landscape; it's so tall that it can be seen from University and King. It goes without saying that it's the largest library on campus, and as such, is never, ever full. This is Dana Porter's biggest advantage.

Dana Porter is a very "well-rounded" library. As I mentioned before, there are always seats available, and furthermore, has all-day hours and is in close proximity to most buildings on

campus (although it is a little further away from the Math buildings than the Davis Centre is). So what's not to love?

I'll tell you. Elevators that always go out of order, forcing you to either wait your turn in the lobby for the single remaining elevator or to climb several flights of stairs. Ancient and gnarled carrels desperately needing replacement, with crumbs in the crannies and words scribbled all over their striated surfaces. Broken light fixtures. Needing to get onto your hands and knees to plug your cord into the electrical outlet. That awful, musty book smell. I could go on.

But in the final analysis, these are just minor quibbles. What matters more is that Dana Porter is the only Main Campus library that's reliable. If you like silent study areas like I do, there's no better place than Dana Porter to go to for a quick study session in between classes.

Some tips: avoid the floors marked for quiet study, i.e. floors three and six. Both floors have newer carrels—the third floor has the cedar Peter Sims-type desks, while the sixth floor has even newer charcoal and green ones. More often than not, they'll be full, and the sixth floor especially will have a decent chance of being loud with chatter (small study groups are allowed). I think I should also mention at this point in the article that if you are over, say, 160 centimetres tall, you'll find the cedar carrels to be too short. I'm not especially tall—you'd probably consider me short if you met me in person—but I have to hunch over so much on those desks, and my back sometimes starts to hurt after I've sat there for too long.

2: LUSI WONG LIBRARY

The Lusi Wong Library is Renison's library. In contrast to the library just before it on this list, the Lusi Wong Library is the smallest UW library, with a total capacity of only a handful of people. Despite this, it's usually worth the gamble to look for an empty desk, since it's such a great little place. The small size, combined with the strictness of its front-desk librarian, makes the Lusi Wong Library the quietest library on campus. Absolutely no joke. You could hear a pin drop in there.

The library also has a unique minimalistic atmosphere. Instead of having bookshelves in the centre of the room, they're off to the side, which makes it feel open. The tables and carrels are all white, and there are large windows which illuminate the whole library with light. It almost feels like a sunroom at times.

Since the library is so small, there's not very much to say about it, at least in comparison to the other libraries I've discussed.

1: MILTON GOOD LIBRARY

The Milton Good Library is the library of Conrad Grebel University College. It takes longer of a walk to get there compared to the other University College libraries, but that's not something that really deters me. I like going to the Milton

Good Library when I have a longer study session planned out; a nice walk outside clears the head and makes for a good break.

Like the Lusi Wong Library, the Milton Good Library has large windows which fill the interior with natural light. Unlike the Lusi Wong Library, the Milton Good Library is split into two sections—a strictly study-only section with chairs and tables, and an actual library section with individual carrels hidden among the bookshelves. I normally study in the former, since I really like the long tables as opposed to the walled-off carrels—it allows me to spread out all of my papers and whatnot, and it just feels less claustrophobic. There's always space in the library, and I often am able to hog a whole table for myself unless it's the first week of finals. It's usually pretty quiet, but when it's not, checking out the other portion of the library might be a good idea.

Now, the individual carrels in Milton Good Library are, for all intents and purposes, reserved for certain graduate students. In fact, there's a little disclaimer about this on each carrel, with the name of the graduate student it's assigned to. But the disclaimers also say that you can use the carrel as long as you vacate it if the graduate student shows up. What this all means in practice is that if you see a carrel without any leftover books on it, you can feel good about using it for the day; statistically speaking, it's probable that the student whom the carrel is reserved for doesn't actually use it that much. And the Milton Good Library carrels are top-notch—they've got the same sleek feel as the new Davis Centre Library carrels, except they're wider.

—

That about ends my review of UW's libraries. It has been a long time since I stepped foot in any of them (at least six months) so forgive me if I remembered something wrong. If you all actually remember what I said this article and start showing up to Milton Good Library en masse next time we're all back on campus, I'll be very sad.

Finchey

I AM HONoured TO ACCEPT HIS INVITATION

Hello, my name is Joo Dee.

Welcome to Waterloo, shall we get started?

You are simply taking a short vacation to Lake Columbia.

The invitation to Lake Columbia was quite relaxing.

Highly recommended location for a vacation 5%.

A Mathemagical Psychic And Astrologer

AVENUE 5 IS THE SHOW OF OUR TIME

Avenue 5 is a comedy show by Armando Iannucci, writer of *The Death of Stalin* and *Veep*, and in general, a guy whose work you should check out. In the show, Hugh Laurie plays a space captain piloting the Avenue 5, a futuristic space cruise ship. He is accompanied by the impossibly rich Herman Judd, the Avenue 5's owner, as well as Billie, the ship engineer, and of course the passengers, including an obnoxious, entitled know-it-all passenger named, you guessed it, Karen.

After an accident with the ship's gravity system, the Avenue 5 is thrown off course and a six month trip gets extended to several years. In the midst of this crisis, a few things become clear:

First, the captain isn't actually a captain, and in fact knows nothing about piloting a ship, because he, and his bridge crew, were hired by Judd as actors to look good for the passengers.

Second, Judd himself is an idiot with unnaturally blond hair. His shining moments include showing off his genius idea that led to his wealth (a post-it with the word SPACE! on it), and worrying that he's going to die like Richard Branson (fed to

his own pigs on his private island).

Third, the engineers who really keep the ship running are locked in the basement, because Judd thinks they're ugly.

Also, the passengers are idiots, including one gem of a scene where some of them become convinced the whole ship is a massive reality show, try to leave through the airlock, and... die.

Clueless leaders chosen for their star quality. Ignored and neglected experts. An idiot rich person who owns everything. A general public eager to jump on the first conspiracy theory that comes their way. Oh yeah, and the continual state of mortal danger.

Avenue 5 is the show of our time. If you want to see what they predict for our future next, the show is available on HBO, if you're as rich as Herman Judd is. If you're not, it's also available on your illicit streaming site of choice.

UW Unprint

TAG YOURSELF AS SELF-IMPROVEMENT PLANS I MADE DURING THE QUARANTINE

CHLOE TING'S ABS WORKOUT CHALLENGE (52/2) × n, n ≥ 0

- A himbo, regardless of gender
- At the top left corner of the Goth-Prep/Nerd-Jock chart
- Supportive friend, maybe a little enabling at times but you can always count on them to hype you up and it's the thought that counts
- From a small town on the BC-Alberta border where everyone knows their mom

LEARN HOW TO DRAW SO I CAN MAKE BIRTHDAY ART FOR MY FRIENDS AND MORE CONTENT FOR MY OBSCURE FICTIONAL FAVS

- Beautiful cinnamon roll, too good for this world, too pure
- A weeb, but are you really going to call such a nice person a dirty weeb? Does it not hurt your conscience? Can you even bear to look at yourself in the mirror?
- The "graphic design is my passion" meme incarnate
- Pretty much compatible with everyone

GET BLUE-BLACK TO LAVENDER OMBRE HAIR (NOT DIY, I STILL HAVE SOME FEAR OF GOD IN WHAT'S LEFT OF MY HEART)

- Majoring in Minecraft
- Zero sense of financial responsibility. Would benefit from an AFM or a FARM degree
- Non-recyclable garbage nerd who takes 4th year PMATH courses for fun, slam dunk them in the trash. Actually maybe not, they're kinda funny
- Confirmed **mathNEWS** writer

GO ON EXCHANGE, AND EVENTUALLY VOLUNTEER WITH THE UN AND USE CS SKILLS FOR SOCIAL GOOD AS AN ACT OF ATONEMENT FOR MY PAST 20-SMTH YEARS OF COWARDICE

- 85% of daily fluid intake is cold brew coffee, the other 15% is Arizona
- Extra™
- Crippling feelings of inadequacy every night from 11pm to 2 am
- This is their 3rd term of taking at least 6 courses, but they make it look like they're only taking 2, h o w

I'll let you decide for yourself how many of these I've actually stuck to/will be sticking to (Hint: currently not that many, but hopefully that'll change...). Happy Day 101 of social distancing!

MODERN PROBLEMS REQUIRE MODERN SOLUTIONS: LEARN AS A DATING SITE

Frustrated with dating apps? Tired of being unable to make that *special* connection through generic online means? Wishing you were on campus to meet that special someone who's lived the UWaterloo student life experience too?

Introducing D2L's flagship product: Learn.

Learn is coy. It advertises itself as an online learning platform—but secretly, Learn is awesome as a dating site because it connects people with similar interests: students in the same classes are automatically grouped together, and Learn has many features to make connections happen: D2L doesn't stand for *Desire2Learn* for no reason!

SET UP YOUR PROFILE!

Learn has all sorts of things you can use to make the best dating profile possible! Everything from your nickname, to your hometown, to your favourite websites can be put on your profile to let potential partners know what you're all about! Also, you can choose a profile picture here: the picture usually only shows up in small, thumbnail-size spots, so choose one accordingly!

To start building your profile, click on your name in the top-right corner of Learn and select profile!

WRITE YOUR BLOG!

As UWaterloo is an academic institution, it only makes sense that dating profiles are based on only the most rigorous of intellectual discourse: blog posts. A fine blog will allow you to demonstrate the best parts of your personality, and undoubtedly draw suitors. Want to show off your funny side or your superlative wit? Let the world know about your poetic skill or research accomplishments? A blog is a sure-fire way to do so!

To access your blog, go to any class, then select Connect > Classlist. Find your name on the list, then click the dropdown arrow beside it and select View Blog (it's a little convoluted, but sure does filter for the stalwart!).

FIND MATCHES!

Everyone has a favourite class, and in UWaterloo, classes are a huge part of your life. It only makes sense, then, that people who take the same classes as you are the people you can connect with! Nothing's as good as starting with a significant common interest!

Want to find someone to love who loves MATH239 as much as you do? Looking to meet somebody who has Chemistry with you? Click on a class you're enrolled in of your choosing, then select Connect > Classlist. This'll give you a list of people who are also in your class. You can view each person's blog by

clicking on the dropdown arrows next to each person's name. Take a look, find someone, then, it's time to...

SLIP-SLIDE INTO THOSE LEARN DMS!

Learn has integrated direct messages and a friend list: Perfect for chatting with that special someone. Blogs and public discussions are great for learning about a person, but at a certain point, talking one-on-one is what you'll both be looking for.

Click on the mail icon on the top of the webpage, then click Instant Messages. At the top of the new window that opens, you can select Classlist to find the person you'd like to chat with, and even add them as a friend!

BONUS: VIRTUAL SOCIAL SPACES!

Missing hitting up the bar due to social distancing? Learn has a solution for you! Every class you're in comes with it's own space to mingle and meet, called the discussion forums! You can chat, you can drink (drink the splendidly metaphorical knowledge of math, of course), you can dance (Learn supports Youtube video embeds! TikTok support remains to be seen!)

To go hang out at the Learn bar, click on the class you want to visit, then Connect > Discussions.

IN CONCLUSION!

Modern problems require modern solutions. As D2L puts it:

[Learn's software] is the foundation of your learning platform and your gateway to continuous innovation.

What better continuous innovation than to re-purpose Learn as a dating site to deal with the today's pandemic's issues? Ideas Start Here—many people meet SO's in university, and with campus closed, Learn is here to save the day!

CC

P.S. With great knowledge, comes great power, comes great responsibility—please don't be creepy. Thanks!



KEANU REEVES AND THE BATTLE FOR THE INTERNET

AN AI DUNGEON STORY

AI Dungeon (<https://play.aidungeon.io/>), a text adventure that uses AI to generate story based on your prompts, has just updated to a new text generator. I thought I'd try it out. Take a guess at which parts I wrote and which parts the AI did.

I am Keanu Reeves, and it is the year 2099. I'm on the hunt for the famous computer hacker known as 4chan. The internet has become a place where people can come together to talk about anything they want, but most importantly, share ideas and information.

Unfortunately, the internet is also full of Nazis. A lot of Nazis. If someone posts a swastika on 4chan, the Asian community will shove a Japanese Flag up his/her asses. In the year 2099, the leader of the Asian community, China, is the new world superpower. The world currency is Bitcoin, mostly mined in China. Anyone who speaks out against the government is sent to a gulag for re-education. Your job is to break these people out of the gulag. Be careful, though.

Luckily, I've been working to overthrow China for years. But, they've grown wise to me, and I'm now the most wanted man in the world. The U.S. government recruited me, but fired me after I blew the whistle on them for mass manufacturing drugs and vaccines. Now, I work on my own, trying to tear down the corrupt system. I recently came across information that the head of the Chinese government, Xi Jinping, plans to release a bunch of hostages he's been holding in an abandoned hospital.

I fly to the hospital on my stealth helicopter, designed to avoid the worldwide surveillance network known as WhatsApp. I need to rescue the hostages, but I also need to do it quietly. So, I wear motorcycle boots, a black hooded sweatshirt with the hood up, and sunglasses to avoid CCTV cameras. I also have my trusty phone, which can hack into almost any computer system. I just need to remember to turn it off before I go inside. I enter the abandoned hospital through the back door. As I expected, CCTV cameras are everywhere. Luckily my sunglasses give off a form of IR radiation that disables them. Unfortunately, it also gave me cataracts, which I had removed.

I can see the cameras, but they can't see me. As I expected, a group of unarmed prisoners are waiting for me. They seem fairly happy, which is good. I work on removing their restraints for the past week. It's a slow process, as I have to bypass multiple security systems. I give the guards a little extra incentive by having the prisoners remove their handcuffs. Finally, the restraints are off. I use my phone to disable the guard's earpieces, and escape with the prisoners in my stealth helicopter. We fly over the city, where I tell the prisoners what I showed them. I showed them how the government is purely evil.

One of the prisoners steps forward. His name is John Internet, the inventor of the Internet. He says he can prove it. He takes out his phone, and surfs to YouTube. He peels back the

layers of code, revealing the first one. It says: written by John Internet, 1998. Then, he shows the next one. It says: created by John Internet, 1998. This one is from the same guy. I give John a look. I ask John, "why were they imprisoning you?" John explains, "In the year 2000, I created 4chan, the largest anonymous imageboard on the internet. I was against the censors of the day, who wanted to remove any images of Lolcats and " "the Chinese government went after you", I finished. "They took down 4chan. "Yes", John answered. "But," he continued, "there's still an archived copy of it in the World Internet Headquarters in Beijing." "So they're going to try to take down the new internet?" John interrupts, "That's what the FBI says."

Suddenly, my helicopter's engines stop working. The stealth helicopter falls out of the sky. The other prisoners, who I have forgotten about, die in the crash. Me and John stumble out of the wreckage. I had forgotten about my injuries. They were killing me. My first concern? John is dying. He's lying on the ground, badly hurt. His phone is out, and he's pressing numbers. "These are the security codes for the World Internet Headquarters", he gasps. "They never fully revoked my access. You have to get there and stop 4chan, before its too late." He drops the phone and dies. I know this is important, but saving the internet is the least of my concerns. I really should try to save John. But, I also have to get to the internet. I use the Google Fit app to confirm it: John is dead. I use my phone to confirm my location, the outskirts of Beijing. I decide to make my way to the World Internet Headquarters. I don't know what else to do.

Unfortunately, Uber is on surge pricing right now, so I have to walk. I limp along. I should get to the headquarters within a few hours. I have time. When I arrive, I'm in a secluded valley. The entrance to the internet headquarters is a massive cube. I see there are no guards. The Chinese government has decided they are too prone to corruption. Also, they have to take lunch, which is annoying. I admire their massive computing power, which they use to run 4chan. To get inside, I'll have to solve four levels of security. I'm not sure how I'm going to do that, though...

Luckily, I copied John's phone before I left. On it is a wealth of information. In particular, I see the codes and specifications I'll need to bypass the security. I memorize them, then head to the internet headquarters. There, I get to work. I type in the specifications I found on John's phone, and begin tapping on the computer keyboards. One by one, the layers fall, and I'm in.

Well, that's the story. Not too bad for a big pile of linear algebra. **mathNEWS** writers, consider yourselves on notice. Automation is coming for you too. *[Editors Note: Now, they just have to automate the layout.]*

"ONE OF THESE AGAIN?"

gridCOMMENT 143.3

Yep, another issue, another recycled **gridWORD**. *C'est la vie*. To tell you the truth, the main reason I'm putting in this **gridWORD** here to so that we can have an even number of pages in this issue. Yep, I said it. Blasphemous much? Possibly.

I suppose a secondary reason would be that the **gridWORD** has always been part of **mathNEWS**, so it would go against tradition or just feel incomplete to have an issue without it. But then again, if an editor whips up a **gridWORD** with no one around to solve it, was it really worth all the work in the first place?

I'm getting ahead of myself. This issue's **gridWORD** is another recent one; it's from V1414, which was published on November 8, 2019. It was made by the venerable Zethar, the **gridMASTER** of legend.

For completeness's sake, this issue's **gridQUESTION** is: "What is your condiment of choice for french fries?" Send in your answer to mathnews@gmail.com with a name to be credited under so that next issue's **gridCOMMENT** isn't just me talking to myself for four paragraphs.

clarifED

ACROSS

- 1. Look daggers
- 6. Teen affliction
- 10. Blue hue
- 14. Polish city
- 15. Weaving machine
- 16. To put off
- 17. Kipling's wolf pack leader
- 18. Ripped to shreds
- 20. Secret-keepers
- 22. Born
- 23. Zeta follower
- 24. Floral ring
- 25. Mins. and mins.
- 26. Lair
- 27. Old-school reply mechanism (abbr)
- 29. Highlands hillside
- 31. Unadorned
- 32. Sigma's follower
- 34. People you beg marks from
- 37. Final reckoning
- 39. Watertight chamber
- 40. And more
- 41. Photos
- 42. ___ von Bismarck
- 44. Flat metal shelves
- 48. United Nations agcy.
- 49. Grass part
- 51. Embrace
- 53. Poseidon's domain
- 54. Point
- 55. Large-canine felines
- 58. Addendum
- 60. Regions
- 61. Itinerary info
- 62. Weight not charged for
- 63. Take off
- 64. South African currency
- 65. Outback birds
- 66. Like a shoe

- 13. Something you should do to class
- 19. Beast of burden
- 21. Remedies
- 28. Cases
- 30. Go-between
- 31. Sandy destination
- 33. Much spam
- 35. Eschewed home cooking [2]
- 36. Banned pesticide
- 37. Matrix of partial derivatives
- 38. Night light?
- 39. Protozoan group

- 41. Harold ____, Nobel-winning playwright
- 43. Trios
- 45. Bony
- 46. Comport oneself
- 47. Disseed, in a way
- 49. Venom source
- 50. Ralph of "The Waltons"
- 52. To-do list
- 56. Off-white
- 57. Certain cookie
- 59. "Acid"

DOWN

- 1. Good ____, to be viewed favourably
- 2. Sitting Bull tribe
- 3. Mound builders
- 4. Massage deeply
- 5. Modern letters
- 6. Star in Aquila
- 7. Nocturnal critter
- 8. Boreal
- 9. Arab leader
- 10. Mobile program
- 11. Problem
- 12. Film action?

1	2	3	4	5		6	7	8	9		10	11	12	13	
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lookAHEAD

SUN JUNE 28

Tau Day

MON JUNE 29

Canada Day 🇨🇦

TUE JUNE 30

WED JULY 1

Vote in the MathSoc elections!

THU JULY 2

FRI JULY 3

Vote in the MathSoc elections!

SAT JULY 4

SUN JULY 5

mathNEWS 143.4
production night

MON JULY 6

TUE JULY 7

WED JULY 8

THU JULY 9

FRI JULY 10

mathNEWS 143.4
published

SAT JULY 11

A BRIEF INTRODUCTION AND A SINCERE REQUEST

MathSoc Vice President Academic here. Just wanted to introduce myself as I assume not many people know much about me or what I do. My name's Alan, and I'm a Computer Science and Business Administration student getting by in his 3A term. This semester I've just been chilling at home with my courses waiting for the day I can see the Waterloo campus construction-free. But on top of that, I've been advocating for important issues related to us mathies like the use of online proctoring tools for future semesters and whether students are okay with being charged for tools they might not like.

I'm reaching out to you so you can tell me about any concerns you might have for your courses, co-op, tuition, the future, or anything of the sort. I'll be your vehicle to getting the concern heard and resolved. If you could fill out this survey (<https://tinyurl.com/mobiussurvey>) about your experience with Möbius, it would help greatly to give me an idea

on whether students are satisfied with the tool and would be okay with having to pay for the software. For any concerns you might have, you can email me personally at vp@mathsoc.uwaterloo.ca. Stay safe everyone.

Your Local Advocate



THIS WEEK'S gridSOLUTION

G	L	A	R	E	A	C	N	E	A	Q	U	A	
R	A	D	O	M	L	O	O	M	P	U	N	T	
A	K	E	L	A	T	O	R	E	A	P	A	R	T
C	O	N	F	I	D	A	N	T	E	S	N	E	E
E	T	A	L	E	I	H	R	S	D	E	N		
S	A	S	E	B	R	A	E	B	A	L	D		
			T	A	J	U	G	R	A	D	E	R	S
			J	U	D	G	M	E	N	T	D	A	Y
			C	A	I	S	O	N	E	T	C		
P	I	C	S	O	T	O	T	O	H	O	B	S	
I	L	O	A	W	N	H	U	G	S	E	A		
N	I	B	S	A	B	E	R	T	O	T	H	S	
T	A	I	L	P	I	E	C	E	A	R	E	A	S
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R	A	N	D	E	M	U	S	S	O	L	E	D	