

“WHEN IS MATTHEW?”

Good evening¹, my dearest most beloved reader!

You might be wondering what the **mastHEAD** question this week is. And to that, I would tell you, it is democracy. This **mastHEAD** question was written by our most wonderful writers collaboratively at this issue's (in-person! socially distant!) production night.

You may wonder how up to 11 writers^{2,3} were involved in the writing of a single three-word question. The answer is long, complex, and might be an interesting topic for linguistics and political science research for years to come. They wrote the sentence by going in a circle and having each writer contribute one letter (or punctuation mark) at a time. As for the answers, you need to figure that one out yourself – and if you do, let me know what they mean too, cause I have no idea.

If this sort of thing sounds fun to you, come to our next production night! All you need is a Campus Check-In green checkmark and the desire to write things and make friends.

Speaking of production, this issue looks absolutely gigantic. There's 30 sides, 15 whole pages! If I were a staple at W Print about to be used in the next **mathNEWS** issue, I would start to get worried right about now. As a reader though, all you need to feel is excitement, the content ahead is all as delicious and filling as a large Lazeez. That is a compliment, not an insult, to be clear.

Finally, and perhaps most importantly, the avid **mathNEWS** reader might notice that **gridWORDS** are back! With the return of ink-and-paper **mathNEWS**, the time is ripe to pick up a pen and start filling in the **gridWORD** at the back of this issue whenever you're feeling particularly bored. Send your solutions (including partial ones!), and the best ones get their **gridQUESTION** answer featured in the next issue. For more details and the **gridWORD** itself, see the second-to-last page.

Have fun reading and solving!

caffeinatED
Editor, **mathNEWS**

1. Please read the **mastHEAD** in the evening for maximum accuracy.
2. The room we got had a capacity of 15 due to COVID regulations.
3. We discount the 4 editors due to concerns about concentration of power. Democracy!

CC	How as the part same the word “activation” where a part overtones the other part.
ABALD MAN	Yesterday, today, and tomorrow
DERIVING FOR DICK	At tooth-hurty!
A COOL PEN NAME	!?†‡↔◊©↵↶☒
SKIT	I'll do you one better. Why is Matthew?
SECRETSQUIRREL	Whichever he chooses to be!
PREDAP	Matthew as a name really originated from the Apostle, so... around 30 AD?
TENDSTOFORTYTWO	NTA — your Matthew, your rules.
PEACELOVEMATH	Math is due at midnight EST
WHILD	Skit took my answer!
NOT A N*RD	Yes
BOLDBLAZER	Are you in a Tardis or something?
EVILEVIEVIL	Matthew is running late...
FINCHEY	Who?
GOLDEN	Everyone asks when is matthew, nobody asks how is matthew :(
ETERNALLY PUZZLED	Trivago
APHF	Matthew was formed when the first stars in the universe were born, and he will die when the last stars in the universe burn out. Matthew is forever. Eternally watching and waiting.
WALDO@<3.LE-GASP.CA	Whenever I'm finished with a Marcus (hint: NEVER :P)
X	Matthew has been the University of Waterloo's bastion of erudite thought since 1973.
ROYAL NO.69 MILK TEA	I read Matthew as mathNEWS at first so I think the more important question is: when is mathNEWS ?
GIRAFARIG	H Y A ! I W M N M S Y A M W W T M W M I H
GOD ⚡ PEED	Matthew exists independently of what you perceive as time.
BIPED	18:30 Eastern Monday nights, every two weeks
CLARIFIED	Never.

ARTICLE OF THE ISSUE

Congratulations to *The Halloween Problem* by evilevilevil for being the Article of This Issue! It's topical, it's fun, and it has an advertisement for a URA. What more could a person want? Collect your \$25 gift card at our office, MC 3030. (Or email us at mathnews@gmail.com if we're not around.)

caffeinatED
Editor, **mathNEWS**

Here's to the Matthews. You not just Matt; you Matt-er.

NAMAN SOOD, **mathNEWS** EDITOR FOR FALL 2021
ALONG WITH KEVIN TRIEU, CLARA XI, AND YANG ZHONG

mathASKS 147.3

FEATURING PROFESSOR AUKOSH JAGANNATH

BOLDBLAZER: WHY STATISTICS?

Why else? It's fun! Also, as anyone who's taken a class with me knows, I don't believe in the labels like pure math, applied math, and stats. Math is math. The labels are made up to help organize things.

ABALD MAN: TAKING STAT 240 WITH YOU WAS LOTS OF FUN. WHEN ARE YOU TEACHING STAT 240 AGAIN?

Thanks, I had a blast teaching you—you were an incredible bunch of students!

I'd love to teach it again as soon as possible. But as to when, it's not my call. Ask the SAS Associate Chair (Undergraduate Studies)!

QUANTUM GOOSE: CAN YOU DESCRIBE YOUR RESEARCH IN 500 WORDS OR LESS?

Fix a simple domain in N -dimensions. If you like continuous things, think the sphere, or if you're more discrete, think the boolean hypercube. Now take a polynomial in N real variables restricted to this domain. In the high-dimensional limit ($N \rightarrow \infty$): what's the topology/geometry of its level sets? Can you optimize it efficiently? If not, how deep can you go? More interesting: what are the answers to the questions for a "typical" (i.e., random) function?

At a high level, I study the statistical and geometric properties of random, high-dimensional complex energy landscapes like these and how these properties affect the evolution of dynamical systems and algorithms on these landscapes. These problems show up all over in (mathematical) physics (e.g., spin glasses), C&O (e.g., extremal cuts on random (hyper) graphs, non-convex optimization), statistics and data science (e.g., estimation and testing with complex data), CS (e.g., SAT), and pure math (e.g., statistics of the Zeta function). I use tools and techniques from probability, PDEs, and the calculus of variations to tackle these questions.

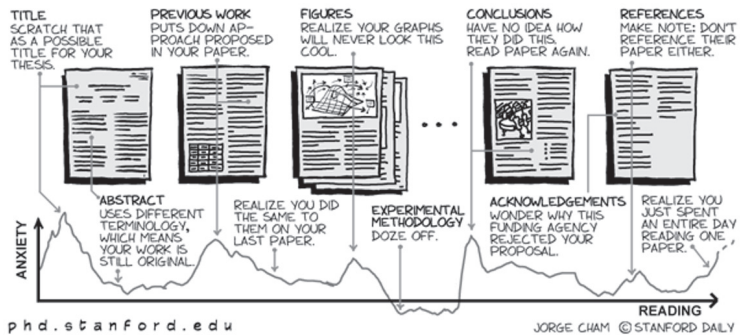
A COOL PEN NAME: YOU'VE PUBLISHED A TON OF RESEARCH — WHAT'S A CONDENSED SUMMARY OF YOUR RESEARCH PROCESS, FROM IDEA TO PUBLICATION?

Tough question...

Write,



read,



and attend lots of talks.



Now that you've seen Fermat's Little Theorem, you may be wondering about Fermat's Big Theorem.

PROF. PENNY HAXELL

TENDSTOFORTYTWO: WHAT DO YOU MISS THE MOST FROM THE US THAT DOESN'T EXIST IN CANADA?

Home (NYC) and family! Definitely miss a good NYC bagel (Montreal bagels are also great! But I've yet to find a good bagel around here...) And Fahrenheit. I still have no idea what 15°C means.

TENDSTOFORTYTWO: CONVERSELY, WHAT ARE YOU GLAD YOU HAVE IN CANADA THAT YOU DIDN'T IN THE US?

My wife! Other than that the list is pretty long. A functioning government and politics that hasn't gone completely off-the-rails. A society that recognizes that quality healthcare is a human right (<https://www.who.int/about/governance/constitution>), not a commodity, and that you should not have to decide between taking care of your child right after they're born and having a job. (To me, it's definitely a better and cheaper place to raise a family for an average person. Don't let the relative tax rates fool you!) Multiculturalism v.s. the melting pot...

On a less serious note: the nature! The food! (The food scene in southern Ontario is as good as in NYC. The Indian/Asian food scene is in a completely different league here than anywhere in the US!) The list goes on...

Canada's an amazing country and I'm really happy to be here!

A COOL PEN NAME: WHAT IS YOUR FAVORITE UNIVERSITY THAT YOU HAVE WORKED/STUDIED AT?

Waterloo is a really awesome place to work at. The colleagues are all great to be around. The energy of the students here is just incredible. It's been so much fun so far! (NYU/Courant was a pretty fun place to be at as well!)

PMC PROBLEM OF THE WEEK

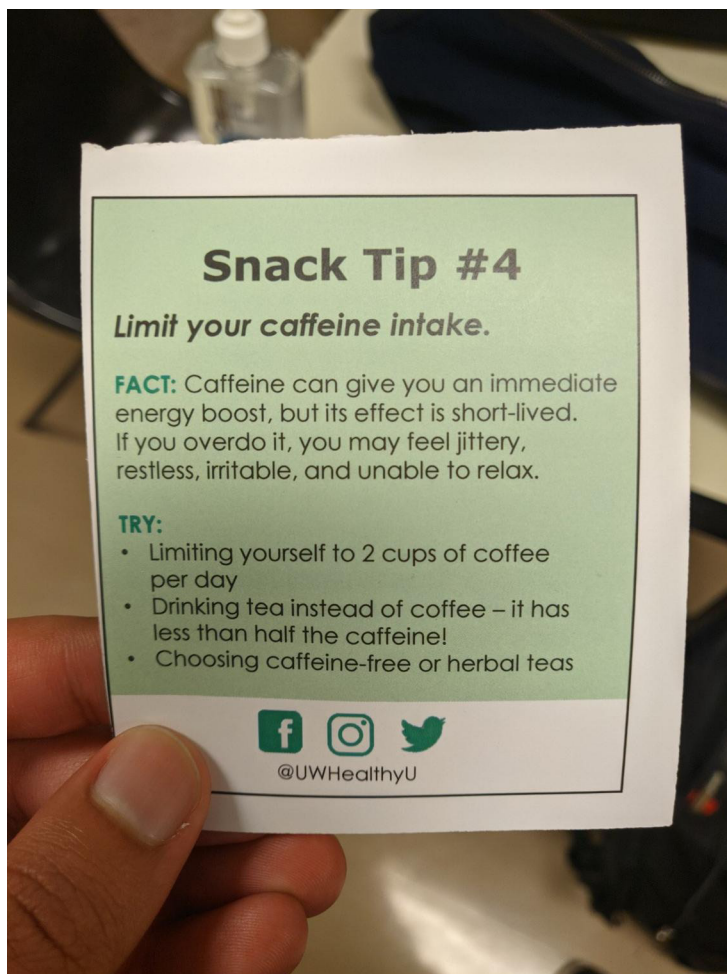
Here's another Problem of the Week coming in! This week's prize is a \$25 gift card of the winner's choice. We accept multiple solution formats, email (pmclub@gmail.com) and Instagram ([@uwpmclub](https://www.instagram.com/uwpmclub)) are the most common. Here's this week's problem:

Put 77 chocolate bars into as few bags as possible such that you can give either 11 children 7 chocolate bars each or 7 children 11 chocolate bars each. (You can only distribute entire bags to children, and children cannot share the contents of a bag.)

You have two weeks to send us a solution. Good luck!

VP Propaganda, PMC

DEAR MATHSOC: NO



caffeinatED

10 YEARS AFTER THE FIRST CAMPUS WIDE EVENT, HUMANS VS. ZOMBIES IS BACK!

What better way to get to know campus than to run around in the middle of midterms finding hidey-holes and ways to beat the opposing team (be they human or zombie)? This term's game runs from October 25th through 29th. For more info on rules, COVID protocols, and sign-ups, check out uwvhz.uwaterloo.ca, or join our Facebook group. Hope to see you playing, and stay safe!

Narf Dert

profQUOTES

AMATH 250: JOE WEST

“ I will bring my slinky soon.

CO 487: DAVID JAO

“ I didn't know cryptography back then. Now I know cryptography, and you will too, in a moment.

“ Everybody has a Gmail account, right? Well, almost everybody.

“ *[Writing down names of key derivation functions]* I know this is just random garbage for you.

“ So... that was a lot.

“ *[Talking about bitwise cyclic left shifts]* This is easy to do on any sane platform... I have to unfortunately report that there are some insane hardware platforms where this is hard to do.

“ This attack is called POODLE, because apparently every attack needs a cute name in order to become popular.

CS 360: JEFFREY SHALLIT

“ Is that clear? At least believable?

MATH 145: DAVID JAO

“ You can trust it because it works.

“ Fuck RSA.

“ You shouldn't be spending more than 15 hours per week on this course.

“ We have four minutes. What should we do in four minutes? *[Proves the Well-Ordering Principle]*

“ Fun fact: I actually have no idea why this works.

“ You can learn this in category theory. Depending on when you want to learn it, this can be next year or never.

“ I can't do algebra.

“ Let's talk about wokeness for a minute.

“ If you are sufficiently woke...

“ If you're sufficiently awake, you'll realize that all these theorems are named after white Europeans.

“ What did Pythagoras have to do with the Pythagorean theorem? Nothing.

“ The original application for this was not for solving homework problems for MATH 145.

“ This is one of those European white dudes, ok?

“ Except Hilbert didn't have Coq.

“ These are the fun things you can do with Coq.

“ There is a proof, it looks like this, and this is what it looks like.

“ Ken Davidson the student gets to lose points. Ken Davidson the teacher lets you figure it out.

“ Make sure you get your 5G vaccines for the full experience.

“ When you get to four levels of bullets you know your proof is very complicated.

MATH 235: NICK ROLLICK

“ 1 gives you 1 every time you ask something from it.

MATH 247: BLAKE MADILL

“ This was a private post, so not all of you—and in particular, none of you—saw it.

“ We only use the epsilon definition of infimums in the real world.

“ Let's look at this very interesting function. Ha, just kidding—it's a very boring function.

“ So why is this true? Well, the result is clear if... hmm. Imagine if I just left it there.

PHIL 221: MATHIEU DOUCET

“ I could say “I'm done with with this whole university thing, I'm going to fish”... I'm not going to fish, I get too cold easily.

PMATH 340: TOMAS VAVRA

“ Wait... is that true? Yeah, I hope so.

“ In general, the formula is... a bit ugly.

“ The Legendre symbol equals 0 in the perverted case when $a = 0$.

“ I googled the intuition behind this theorem and what I found is that there is an intuition for it if you are a genius.

VARIADIC FUNCTIONS IN C

It's me again, here for another article of unhinged ramblings about stupid beautiful language features. This time it's not about C++ though (well, it kind of is, but only a little bit)—this time we're dialing back a few years and talking about everybody's real favourite language, C (wherein the “C” stands for “cute”).

You ever wonder how `printf` works? Maybe not. You probably used it in first year and were happy to leave it there, as any normal person would be. But like, it's weird, isn't it? Like, I can do this:

```
printf("Test %s, %d\n", "uhh", 42);
// ... prints "Test uhh 42" followed by a newline
```

but I can also do this:

```
printf("%s b %d %d %s %c", "abc", 1, 2, "def", 'a');
// ... prints "abc b 1 2 def a" with no newline
```

So `printf` can take an arbitrary number of arguments. That's weird—no, *very* weird even! Why can't our functions do that? What makes `printf` so special?

If we were working in C++, then something like this would be pretty trivial. We could make use of *parameter packs* (since C++11) to write a *variadic function template* that achieves a similar effect. Something like this:

```
template<typename T>
void printer(T t) {
    cout << t;
}

template<typename T, typename... Rest>
void printer(T t, Rest... r) {
    cout << t;
    printer(r...);
}

printer("Test ", "uhh ", 42, '\n');
// ... prints "Test uhh 42" followed by a newline
```

This isn't syntactically the same as `printf`, but it gets the idea across. Here, `Rest` is a parameter pack (declared by `typename... Rest`) of types, derived from the parameter pack `r` in the function signature. We expand `Rest` and `r` by putting an ellipsis (...) after each, and the compiler will resolve these

recursive function calls appropriately and do the right thing. Pretty straightforward. But they didn't have templates in C, right? This was 1989, not 2011. What sort of black magic does `printf` use?

So, C has its own tricks up its sleeve for variadic functions, all defined in `<stdarg.h>` (or `<cstdarg>` in C++). Basically, we have a type and four functions that let us do this. The particulars are... implementation-dependent. That means that the specifics of how these things work are generally different across compilers/kernels. It kind of sucks. I'll give an example of how you'd use these to write a variadic function, and then discuss a little about how they work. So, here's an example function:

```
void printer_va(const char* ind, ...) {
    va_list args;
    va_start(args, ind);
    for (int i = 0; ind[i] != '\0'; ++i) {
        switch (ind[i]) {
            case 's':
                fputs(va_arg(args, const char*), stdout);
                break;
            case 'd': {
                char buf[12];
                itoa(va_arg(args, int), buf);
                // Note: itoa converts an int to a string.
                // You can implement it yourself!
                fputs(buf, stdout);
                break;
            }
            // other cases, if we want ...
        }
    }
    va_end(args);
}

printer_va("sds", "testing ", 42, " aaa\n");
```

This works a little more similar to how `printf` works: we can't just give a series of arguments and have them naturally work out; we have to indicate what their *types* are, using an initial string that contains these characters (very similar to the format specifiers like `%d` and `%s` required by `printf`).

We start by declaring a `va_list` and naming it “args”. For most implementations nowadays, `va_list` is a typedef for a struct that somehow stores the given arguments, as well as a few pointers to keep track of things. You could get away with just implementing `va_list` as a pointer, though—and many older implementations did it this way.

The function `va_start` initialises the argument list we declared, “args”, and advances the “argument pointer” to the next one. There's also `va_end`, which ends traversal of the argument list. In most implementations this actually does nothing, but some implementations need it and so it's stuck around in the standard.

I read mathNEWS
devoutly.

PROF. STEVE FURINO

The function `va_arg` is weird. It takes a `va_list` as its first parameter, and takes a `type` as its second parameter. Basically, `va_arg` will access and return the argument currently being “pointed to”, treating the data as being of the type in the second argument. It then advances the “pointer” by one. This is kind of weird, because functions aren't allowed to take types as arguments. This strongly suggests that `va_arg` is actually just a compiler macro... gross. And it turns out it is! All of these functions are just compiler macros. And back in some very early implementations, it was relatively easy to see exactly how they were implemented! But nowadays, there are so many layers of abstraction and hard-coded hacks that it's pretty much impossible to figure out just by looking at a compiler's source.

Here's an old version of `stdarg.h`, included from Linux 0.01 back in 1991, if you care:

```
typedef char *va_list;

/* Amount of space required in an argument list for an arg
of type TYPE. TYPE may alternatively be an expression whose
type is used. */

#define __va_rounded_size(TYPE) \
  (((sizeof(TYPE) + sizeof(int) - 1) / \
  sizeof(int)) * sizeof(int))

#ifndef __sparc__
#define va_start(AP, LASTARG) \
  (AP = ((char *) &(LASTARG) + \
  __va_rounded_size (LASTARG)))
#else
#define va_start(AP, LASTARG) \
  (__builtin_saveregs (), \
  AP = ((char *) &(LASTARG) + \
  __va_rounded_size (LASTARG)))
#endif

void va_end (va_list); /* Defined in gnu lib */

#define va_end(AP)

#define va_arg(AP, TYPE) \
  (AP += __va_rounded_size (TYPE), \
  *((TYPE *) (AP - __va_rounded_size (TYPE))))
```

Even the secret compiler magic uses secret compiler magic! That “function” `__builtin_saveregs()` is written completely in assembly. You can find its definition in some versions of `libgcc2.c` online if you look hard enough; it's admittedly not very enlightening.

The main consequence of doing things this way is that *variadic functions are NOT type safe*. That means the compiler will do nothing to stop you from reading data as a type that's different than what it is. It literally just gets cast to whatever type you give it. And if you read data as the wrong type, there's a good chance you'll get a segmentation fault or illegal opcode or something (fun fact: you can't actually directly treat a variadic

argument as a `char`, since `char` automatically gets promoted to `int` and, if you're using GCC, it'll literally throw an undefined instruction into the assembly to make sure your code doesn't work).

Basically, the gist of it is that `printf` does what it does using some ugly, terrible hacks, and you can use the same hacks in your own code! Although beware that, if you do, your programmer friends who know what's going on will probably want you dead. Just use C++ and templates instead. They're type safe and they're lovely :)

jeff

EDU-ACTION!

Hi!

I'm Gavin, I'm a math student who created the MathSoc Cartoons project. I am currently working on another artistic project with other UW students called Edu-Action! (www.edu-action.ca). In this project, we are trying to develop our artistic and educational skills by making useful resources that explain math topics in simplified ways with lots of visual aids.

I am currently looking for some assistance writing the text for video resources. If you're interested in helping us out and developing your writing skills or learning more about Edu-Action!, please send me an email at eduaction3@gmail.com. I look forward to hearing from you!

Thanks,

Gavin

HEY BABY

Are you good at math?

Not a N*rd

The designers of C were trying to be cute but ended up confusing people.

BRAD LUSHMAN

THE HALLOWEEN PROBLEM

FEATURING TRUE DATABASE HORROR

"I'll take Cleo trick-or-treating right after. Don't worry, we'll stay safe. No problem, enjoy your trip! Bye, auntie." Jerry hung up the phone, and the house fell silent.

A fluorescent green '20:00' glowed eerily in the dark. The rain had stopped, but everything, including the air, was still dripping wet and cold. The ashy fireplace had not yet been turned on for winter. The distant moon shone with a sharp silver hue. All of which gave Jerry chills. Behind him, a small shadow crept closer and closer...

Cleo: JeEERRrryYYYYy...

Jerry: (*Gasps*) Oh my—Cleo, you look like Sadako.

Cleo: Did I scare you?

Jerry: Yes, especially the hair.

Cleo: Thanks! I take that as a compliment! (*Parts her hair*)

Jerry: Well... that's the spirit! Let's go.



The neighbourhood had few families with children. Most houses kept their lights shut—blatantly signalling "NO TRICK-OR-TREATING HERE." Poor Cleo only got a handful of no-name caramels and tootsies rolling around in her bright pumpkin bucket, sadly rumbling as she ran and skipped around. Jerry felt sorry, even though she seemed happy and completely unaffected.

Just as he wanted to say something to lift the spirit (as if her spirit wasn't high enough), a strange house came into sight: its garden was elaborately decorated with bright lights, pumpkins and tombstones, yet the house itself was completely dark and silent in contrast.

Around the neck of a green gnome statue hung a board with barely legible, glow-in-the-dark writing:

=====

"Treats for anyone who catches the candy thief."

- Z

=====

At Z's Halloween Party, Z wanted to give 10 pieces of candy to each zombie who had <50 pieces of candy.

☺(dispenses 10 🍬if # 🍬< 50) 🍬2000

🍬(🍬5) 🍬(🍬9) 🍬(🍬11) 🍬(🍬25) 🍬(🍬25) 🍬(🍬32) 🍬(🍬35)
🍬(🍬35) 🍬(🍬37) 🍬(🍬50)

However, all the zombies looked the same (at least to Z, since Z was also a zombie, and his eyeballs had long since decayed), so Z asked all the guests to order themselves increasingly by the number of candies they own and then

go up to the candy dispenser one by one until the candy dispenser stopped.

50-min later... (zombies are slow)

☺(dispenses 10 🍬if # 🍬< 50) 🍬1720

🍬(🍬50) 🍬(🍬51) 🍬(🍬52) 🍬(🍬55) 🍬(🍬55) 🍬(🍬55) 🍬(🍬55)
🍬(🍬55) 🍬(🍬57) 🍬(🍬59)

Jerry: What is this? These emojis look horrendous...

Cleo: Looks like a puzzle!

Jerry: I agree. But this makes no sense. (*Scratches his head*)

Cleo: What do you mean?

Jerry: Even if everyb- every *zombie* gets 10 pieces of candy, there should still be 2000— $(10 * 9) = 1910$ pieces left. But when the candy dispenser stopped, it only had 1720 pieces left. I don't think this is what Z meant to do?

Cleo: Ohhh... (*Jumps up and down*) That's what he meant by "catch the candy thief!"

Jerry: Ahh, right... I forgot about that. Good point, Cleo!

The temperature had dropped sharply since nightfall. Autumn leaves made crisp rustles in the tempestuous wind. They continued to stare at the board, trying to understand this nonsensical zombie party. It was a good distraction from the howling wind and the cold.

Cleo: But the dispenser still worked correctly as before.

Jerry: Right. It's also strange that every zombie ended up with 50-something pieces of candy. This can't be a coincidence...

Cleo: Hmm... The candy dispenser stops when it encounters a guest with ≥ 50 pieces of candy. That guest should be the one who had 50 pieces of candy initially?

Jerry: If that's the case, how did everyone else get more than 10 pieces of candy?

Cleo: I don't know... They all have ≥ 50 pieces of candy. Does that make every zombie a thief?

Jerry: Wait... After a zombie gets 10 pieces of candy, does it leave or rejoin the line?

Cleo: Well... Z did not tell them what to do. He only asked them to order themselves by number of candies and then go up one by one.

Jerry looked up to the night sky. The moon and stars were barely visible behind the veil of clouds. Elusive thoughts came and left his mind. Wind blew the clouds farther and farther away. Suddenly, everything tied together.

Jerry: That's the problem! Of course...

Cleo: Of course what? Say it, say it!

Jerry: Yes... That's it! After a zombie received 10 pieces of candy, it rejoined the line at a position based on the updated

number of candies. Then obviously, the candy dispenser would only stop when everyone has ≥ 50 pieces of candy!

Cleo: Makes sense... *(Sighs)* After all, zombies don't have brains...

Jerry: Does that mean there was no thief then?
(Machine noise sounds from the back of the gnome)

Cleo: *(Runs to the back of the gnome)* A CANDY DISPENSER!!! THIS IS THE MOST CANDY I'VE EVER GOTTEN ON HALLOWEEN!!!

Her pumpkin bucket overflowed with Smarties and KitKats. As there was no space left for more treats, Cleo and Jerry strolled home before it turned pitch dark.

Inside the house, a shadow slowly rose up and refilled the candy dispenser for its next guests...



THE TRUE ORIGIN OF THE HALLOWEEN PROBLEM

The Halloween Problem got its name on Halloween day in 1976 when it was first discovered by three IBM employees: Don Chamberlin, Pat Selinger, and Morton Astrahan. The query was supposed to give a 10% raise to every employee who earned less than 25000. When the query finished executing, every employee ended up with a salary ≥ 25000 , as the records were stored in a data structure ordered by salary.

AN UNDERGRADUATE RESEARCH ASSISTANTSHIP (URA) ADVERTISEMENT

Are you interested in:

- Automated Reasoning?
- AI Planning?
- Databases?
- Knowledge Representation?
- Programming Languages?

Email Prof. Grant Weddell (gweddel1@uwaterloo.ca) or Prof. David Toman (david@uwaterloo.ca) for Undergraduate Research Assistantship opportunities. Join us as an URA!

evilevievil

A THEORETICAL AND EMPIRICAL RESPONSE TO "HEY BABY"

I am not great at math.

aphf

DEAR U WATERLOO

Thank you kindly for the ample grassland to feed and the bodies of water for sleep. You kindly protect us during the day with your massive roaring cows and centurions staring into their thin glowing squares. We are treated like royalty here. Where we walk, you part and your cattle come to a halt when we wish to wait in the middle of your gray paths. Our waste keeps our fields green, and you keep them safe over the snowy months. During nesting season, we are afforded all of the space we ask nicely for and then some. What superb service! With the arriving cold and our stay here coming to complete another cycle of the seasons, we humbly accept your fealty to serve our continued residence.

MR. GOOSE

SecretSquirrel

NEITHER AM I

But the only number I care about is yours ;)

This is the story of someone in math looking for love! If you too are a lonely Waterloo math student, my past month might give you some hope. The secret to getting into a relationship in this sad city is: pick up lines!!!

One lazy boring Sunday, a bet was made... My friend [redacted] and I decided that we would each test the effectiveness of pick up lines. For the integrity of our scientific study, we decided to use the same glorious line: "Are you good at math?"

I went first. My victim: [also redacted]. [Also redacted] walked in, and the experiment began...

[Also redacted] sat on the couch, as far away from me as possible. Smart. Unfortunately, [redacted] had other plans for me. I, foolishly, got up and in a flash my seat of safety was stolen right under my nose. The only place left: next to [also redacted]. This could only go well.

I sit down. "Fuck it, fuck you, fuck me, fuck it all, fuck everything, fuck fuck fuckity fuck, fuck it fuck, *are you good at math?*"

pt. 2 coming never

Not A N*r'd & Peace<3Math collaboration



WHICH MATHSOC CARTOONS CHARACTER ARE YOU?

THE RULES

Select one answer per question and keep track of your answers. Your final result will be determined by the letter that you most frequently chose as an answer. Answer the **TIEBREAKER** question if and only if there is a tie between your top n choices, to break the tie. For example, if you have a tie between (A) and (B), break the tie by answering (A) or (B) in the **TIEBREAKER** question—whichever answer you identify with more.

QUESTIONS

Q1: WHAT'S THE BEST KIND OF WEATHER?

- A) Clear, sunny skies.
- B) Snow showers.
- C) Gentle rain.
- D) Cloudy skies.
- E) Thunderstorms.

Q2: ARE YOU A DOG PERSON OR CAT PERSON?

- A) Dog person.
- B) Cat person.
- C) Both.
- D) It changes depending on your mood.
- E) You're more of a [insert other animal here] person.

Q3: IN ANOTHER LIFE, YOU'D BE...

- A) A professional athlete.
- B) A musician.
- C) A veterinarian.
- D) A chef.
- E) An astronaut.

Q4: DESCRIBE YOUR STYLE IN ONE WORD.

- A) Comfortable.
- B) Functional.
- C) Refined.
- D) Cute.

E) Unique.

Q5: WHAT'S YOUR "LOVE LANGUAGE"?

- A) Physical touch.
- B) Acts of service.
- C) Quality time.
- D) Giving gifts.
- E) Words of affirmation.

Q6: PICK THE WORD THAT BEST DESCRIBES YOU.

- A) Outgoing.
- B) Perfectionistic.
- C) Open.
- D) Anxious.
- E) Romantic.

Q7: PICK THE WORD THAT LEAST DESCRIBES YOU.

- A) Pessimistic.
- B) Warm.
- C) Spiteful.
- D) Solitary.
- E) Ordinary.

Q8: WHAT WOULD EMBARRASS YOU MOST?

- A) You don't get embarrassed—you have no shame.
- B) Confidently saying something completely false.
- C) Forgetting the name of someone you should know.
- D) Waving back at someone who wasn't waving at you.
- E) Flirting with someone who didn't realize you were flirting with them.

Q9: WHAT KIND OF FRIEND ARE YOU IN YOUR FRIEND GROUP?

- A) The joker.
- B) The advice friend.
- C) The mom friend.

- D) The new friend.
E) The troublemaker.

Q10: WHAT DO YOU LIKE TO LISTEN TO WHEN YOU'RE STUDYING?

- A) A playlist of whatever songs you like at the moment.
B) Silence or white noise.
C) Ambient noise (e.g. rain sounds, coffee shop sounds).
D) Lo-fi hip hop beats.
E) Video game soundtracks.

TIEBREAKER: PICK A COLOUR.

- A) Red.
B) Purple.
C) Green.
D) Light blue.
E) Dark blue.

YOUR RESULT

If you answered with (A) the most, you are **Mathieu**. You're outgoing, energetic, and just a little mischievous. A bit immature, maybe? Nah—you just haven't lost touch with your inner child. Also, you really like math for some reason.

If you answered with (B) the most, you are **Vectoria**. You are organized, diligent, clever—you're a perfectionist. Some find you aloof and hard to pin down, but really, you're just an introvert. Also, you really like math for some reason.

If you answered with (C) the most, you are **Thea Rem**. You have a level head and are a kind, responsible, and dependable friend. However, because of this, you tend to overextend yourself. Also, you really like math for some reason.

If you answered with (D) the most, you are **Coral Ari**. You're a little moody, shy, and anxious. You admit you find it hard to open yourself up to other people. But once you do, you become fiercely protective of those you're close to. Also, you really like math for some reason.

If you answered with (E) the most, you are **Lemuel Ma**. You're extravagant, ambitious, and just built different. You dream of big things and are assured in your ability to achieve them. However, it wouldn't be a bad idea to pull your head down from the clouds once in a while. Also, you really like math for some reason.

Finchey



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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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mathNEWS SURPLUS SALE

We're doing some fall cleaning here at **mathNEWS** HQ, and so we're offering up some of our greatest historical treasures to you, the **mathNEWS** readership. We think you'll find our selection extensive and our prices unbeatable.

UBUNTU 12.04 (PRECISE PANGOLIN) INSTALL DISK



According to Wikipedia, this version of Ubuntu was the first to support IPv6 privacy extensions, whatever that means. Computer history buffs will appreciate this snapshot of Ubuntu development, and people stranded without any other way to install an operating system will appreciate the fact that it still works, presumably.

Price: \$12.04 million

CAMPUS PIZZA CLIP



Perfect for those who can't remember phone numbers, or what good pizza tastes like.

Price: \$74798.88

USS ZUMWALT (DDG-1000)



This 600 foot long guided missile destroyer is one of the newest ships in the United States Navy, and comes equipped with stealth capabilities, 2 naval artillery cannons and a full allotment of anti-ship missiles. Unfortunately, it's taking up quite a bit of space in the office, so we'd like to sell it to someone who's going to get more use from it.

Price: \$67.55

BOTTLE OF ORBITZ



This ancient artifact will never be sold to anyone, and will only be consumed as an elaborate form of seppuku in the event an editor is responsible for the destruction of **mathNEWS**.

It has been included to remind us all that some things really are irreplaceable.

Price: incalculable

To purchase these items, contact us at mathnews@gmail.com. If you're buying the destroyer, meet us at Columbia Lake.

mathNEWS WRITERS FIND LOVE HERE SOMETIMES :P

A SAPPY, DAPPY LOVE LETTER TO MY PARTNER AND FELLOW mathNEWS CONTRIBUTOR, SOVIET CANADIAN

Over 10 years ago in Winter 2011, you walked into the MC computer lab for a mathNEWS production night and I noticed you in your giant floofy Russian ushanka hat and long black trench coat. This is where I first learned your name. I remembered it because I saw you wearing the same damn thing in the front row of our MATH 137 section sometime later.

After quite a while of getting to know you, and quite a bit of socially awkward math-student-ing along the way, we acknowledged that we had a connection... even though it took MANY months in order to actually articulate it. I still remember when you first truly acknowledged me as your partner in February of 2013... that felt like the start of something special.

Since then, you have seen me through a LOT of ups and downs and have supported me through it all. I still remember the bouquet of roses that you and your family sent when my dad passed away in 2015. I still remember all the breakdowns you helped me through by just being a shoulder to cry on. Your hugs make me feel safe and happy, and there is NEVER too many of them when we're together. I will support you as best as I'm able too, even though I clearly have a lot more shit to process sometimes :P

I know you don't like to do much, but thank you for the trip we took together in 2017 to celebrate your graduation. When I had arguably one of my lowest points earlier that year, I'm

so grateful that we took that time together to do something positive. It gave me an opportunity to heal, and you got to meet my family in happy circumstances. I know you enjoyed seeing your friends as well. I want to enjoy more fun things together and for you to meet more of my family.

Although we've been apart due to your job taking you hither and thither, and missing my own graduation in 2019 as a result, it was so great when we finally got to live and be together again... this time TRULY just the two of us in 2020. I want that to continue, and build a happy life.

Thank you also for asserting that our relationship means a lot to you, and fighting for us throughout the chaos that this pandemic has wrought. Even though you consider us essentially married already, I really appreciate you still willing to take the steps to make it official in our own way. I'm super excited to become your spouse on paper, and I'm looking forward to celebrating and telling our families when we've had the time to ourselves.

I hope we continue writing our story together <3 I love you so much.

Here's to us (FINALLY) signing the paperwork on October 29th like we've been talking about since 2016!

waldo@<3.LE-GASP.ca

BIASED COURSE EVALUATIONS

I think the end-of-term course evaluations are biased. I don't think there is anything wrong with the site itself, nor do I think the content is flawed in any way. I just think there is an amount of bias that will never be removable from them.

These evaluations are can only be filled out by those who have stuck with the course past the WD deadline. This means that all those who have been in the course, even up to the WD deadline, but not all the way to the end, will not be able to fill out the course evaluations. There are basically no differences in experience, especially between those that have stuck around just up until the WD deadline and those that have stayed in the course past that date. That group may be one of the most crucial when it comes to their evaluations.

In the past 3 years, there are many courses I ended up dropping or swapping with another at various points through the term. Some happened really early, some at the add/drop deadline, some in the middle of the term, and some at the WD deadline. The majority of the time, it was due to some

aspect of the professor. For example, one time it was due to the professor having just absolutely terrible writing resulting in me unable to take notes on anything written on the board. I ended up swapping to a section taught by a different professor. By swapping, I was unable to do a course evaluation on that professor with the bad writing, telling him that his writing is bad and that I had to swap because of it.

If a professor does something really bad and it becomes a reason for you to drop or swap that course or section, then there becomes no way for you to evaluate that professor and tell them about that bad thing. It's basically a form of the Survivorship Bias.

Thankfully, if there is a professor that did really well, you can at least note that in the course evaluations, such as for my online MATH239 professor who made really incredible lectures. So, I think the only parts that end up missing are feedback on the bad aspects.

THE SMALLEST KINDNESS

CW: This article contains mentions of self-harm.

In Issue 1 of mathNEWS this term, there was an article titled Some Advice. The author of that article claimed that **Nobody cares about you at all** and that you **[should] not think that the support structures of UW will actually help you**. Both of these things are categorically false, and claiming them is incredibly harmful. I'm going to share my experiences dealing with mental illness at UWaterloo, and I can hopefully paint a brighter picture.

Part of being depressed is that there's this monologue in your head that tells you the most miserable lies. Classics for me include *you don't deserve to be alive, you're a stupid piece of shit, you're worthless*, and so many more. In high school, I kept hearing that Waterloo was a depressing, antisocial, and lonely university, and so, even when my mental health was good, I still heard the little voice in the back of my head, saying:

You're going to be just as miserable at UW as you were in high school.

It's early September 2019. I've just arrived at Waterloo, and despite everything, I'm excited! The other people in my residence are so friendly and kind, they're all genuinely awesome people. I'm having an absolute blast in my classes, and for about two weeks, life is phenomenal. After then, though, everything quickly starts to go downhill. I lose motivation and energy, I only eat 2 meals a day (and then 1, and then sometimes 0), I sleep at erratic hours, and I stop attending lectures. By late September, I barely leave my room and I'm frequently self harming.

Everyone was right. UW is awful. Nobody cares about you.

It's late September 2019, and I haven't been to class in a little while. A week? Two? Everything is a blur. I haven't told anyone how I'm feeling, because why would I? My depressed brain has convinced me that nobody gives a shit. One late night, I'm too tired to care anymore, and I finally reach out to my friend R and tell her how awful everything is, I finally tell her I need help. She buys bandages and takes care of my arms. She lets me come spend time in her room and makes me feel safe and cared for, even though it takes so much of her time and energy. She introduces me to her residence Don, who directs me to counselling services, and takes me to my first walk-in appointment. The appointment makes me feel hopeful that I can maybe recover, and even though the feeling is fleeting, it's a reason to stay alive.

R is your friend and it's the Don's job. Everyone else is too wrapped up in their own lives to help.

It's October 2019, and I want to be dead. I'm bleeding, scared, lost, and miserable. I don't know what to do. I'm crying in the bathroom. I don't know what time it is, everything is a blur. I'm using the toilet paper to blow my nose.

Someone comes in and hears me crying.

He leaves.

I'm alone again.

I think to myself that this really is a perfect representation of the UW culture; somebody heard that I needed help and decided to leave because they didn't want to deal with it. I sob and sob and tear off more shitty toilet paper. My nose is so red and is starting to hurt. A few minutes later, I hear someone walk in again. As he walks by the stall I'm in, I realize his shoes are the same as the last guy's. He says "here you go," and slide a tissue box under the wall of the stall. He came back. I'm a total stranger, we haven't met before and probably won't meet again, and he still came back. This tiny act of kindness means the world to me.

That's just one person. Just because someone was nice doesn't mean you matter. Nobody cares about you.

I'm in the bathroom washing some cuts. My shirt is covered in blood. Someone walks in, looks at me, and says "I'm sorry. Make sure you wash with cold water, so that it doesn't stain."

Your professors don't care. There's no point in asking for help.

It's March 2020. My mom works in a hospital and has a potential COVID exposure. I get so worried that she's not gonna be ok that I mess up a bunch of assignments. I talk to my professors a month later; they all understand and lower the weights, or provide opportunities for make up work.

Asking for help is lazy. You shouldn't do it.

It's June 2020, and even though my depressive symptoms aren't too bad, someone I cared about almost died and I can't deal with it. I send one of my professors an email saying "This week has been so hard. Can I have an extension?" He gives the whole class a 2 day extension with no questions asked. Everyone is grateful for it; it seems like we all needed a little breathing room. I'm not the only one having problems.

Your problems don't count. This happens to everyone. You just need to suck it up. Professors won't want to help.

It's June 2021. My grandfather gets extremely sick, and it's clear he's going to die. I can't do work. I send emails to two of my professors. One of them gives me an extension; one of them tells me I don't need to submit anything until I feel ok. When he dies, they both offer me sincere condolences and check how I'm doing.

Nobody here cares about you at all.

It's October 2021, and at this point, I know my brain is lying. The thing is, I have to remind myself of that fact, because when someone else tells you, it's so easy to believe them. The truth is, everybody cares. Not everyone knows how to help, and not everyone knows how to show it, but everyone cares in

their own small way. A door held for a stranger; an extra cup of coffee, shared with a tired friend; a genuine compliment; a joke; a hug or an affectionate touch; a smile, or nod of encouragement when it's most needed; a cookie shared; or any of the million other tiny rituals we engage in to show other people that we do truly care about them.

Professors are humans, and they understand that sometimes shit goes wrong. They understand that sometimes, you just have a week that makes you want to curl up in a ball and cry and stop existing. But they can't know what's going on if you don't tell them, and so if something is wrong, you need to reach out and ask for help. I know it's scary, I know it's hard, I know that not every professor will react perfectly; but you still need to reach out. I promise it will help. I promise that the supports will do everything they can to help you, even if they aren't perfect. I promise that seeking help is the right thing to do, that you deserve kindness and compassion. I promise if you're feeling bad, it's not your fault.

I promise that someone cares.

Golden

HE'S SO CONFIDENT,

I say. My friend nods in agreement, having heard the words before.

I hope my friend understands me. We use the same thesaurus—assured, composed, secure, unshaken—but the synonyms don't work. He is more than that. He is confident in his identity. I try to imagine the journey it took him.

He knows what colours he wears; wears them with pride. Challenges me to wear mine too.

CC

mathNEWS IS

gay.

Deriving for Dick

Racket is nothing but lies.

BRAD LUSHMAN

I CAN'T STOP WATCHING BRAVE POLICE J-DECKER

I swear to the Allfather and the great heavens above. There's this one show called *Brave Police J-Decker* from the '90s and it's like, quintessential '90s anime Saturday morning cartoons, but it goes so much into just heavy existential stuff about what the human experience really is and what robot life actually means, and desires and greed and relationships.

(And then the next episode, they investigate an art thief or chase around a giant panda.)

The story follows Yuuta Tomonaga, an 11-year-old boy who lives with his two sisters and whose parents are travelling explorers, Yuuta befriends an advanced robot built to be a robotic police officer who can also turn into a police car, and calls him “Deckerd,” and after like six months of hanging out, Deckerd develops a soul and heart and in the first episode, performs feats so amazing the police make Yuuta head of the Brave Police—a department of robots just like Deckerd to address the fact that apparently in the future, high tech crime is rampant.

So this is Paw Patrol and Transformers combined together, sort of, but let me tell you it's so nice to watch. Maybe it's not really your type of show and the animation can be kinda janky (and uh... kinda questionable depictions of other cultures), but other than that, I always come back to binge it. So yeah! Check it out! Cry to scenes of loss, questioning your identity, amnesia, learning desire, tension, love, and then laugh at some jokes about putting the robot who can turn into a cool dog in a doghouse.

(By the way, this is the same series where the “Is this a pigeon?” meme comes from.)

Skit

REGRETTABLY LUGUBRIOUS

It is regrettably lugubrious. It is reticently lubricious. It was retrospectively luminous. It was recognizeably luxurious. It will be recklessly ludicrous. It will be representably lucifugous. Coniferous. Odiferous. It is with regret that I am lugubrious. I am lubricious. Lubrious. LubriouSA—lubrious. I'msalubrious. Imsalubrious. I'm ludicrous, lude-a-crude, lewd, crude, and it's hunky-dory. Fol de rol, etc ^[etsy]. Vim and vigour, kith and kin, spick and span. No biggie. Anon, tensely, presently. Futurely, pastly. No cap. No comment. It is lugubriously regrettable.

Lugu

Lug

mathNEWS REVIEWS: LOBSTAH BURGHAH BAH

Fans of beef and Genghis Khan alike were saddened when the Mongolian Grill in the plaza closed after many years of cooking meat on big stoves for the people of Waterloo. But, when God closes a grill, he opens a boat, and the Lobster Burger Bar was born. Can this new establishment do justice to the greatest land empire in world history?

On Friday, October 8th, our intrepid team of **mathNEWS** food correspondents went there to evaluate.

THE DECOR

The Lobster Burger Bar leans very far into its nautical theme. clarifiED liked its “Krusty Krab interior,” and Deriving For Dick called special attention to the giant word “RAW” printed on the wall, and the light fixtures, which he compared to “cock cages.” cy thought the decor suited the theme, and I agree. I liked the whole salty sea captain aesthetic they had. With all the wood paneling, you felt like you were really on a boat, if that boat was in the plaza and not moving. girafarig expressed a contrasting opinion that the restaurant was actually less nautical-themed than he expected.

In more functional terms, both girafarig and Deriving For Dick mentioned that one of our tables was crooked, which, depending on how you look at it, is poor design or leaning further into the sensation of being on a swaying boat.

A bystander wondered, during my interviews, “why is [the restaurant] so blue?”, which I felt obligated to include here.

THE FOOD

Confoundingly, most of the writers present did not get lobster. Me and Deriving For Dick did, however, so we'll start there. We decided, for tasting purposes, to split a lobster burger and a lobster roll, along with a bowl of lobster chowder. Deriving For Dick found the burger to be better than the roll. I think the burger was better overall, but if you were a lobster purist, the roll would be better for you. The burger itself had a cool microgreen-esque topping and a light dressing, which tasted good but perhaps obscured the pure lobster flavor of the roll. The chowder was, in Deriving For Dick's words, “*chef's kiss*.” It reminded me of a fancier version of the C&D soup, which, despite what it sounds like, is a compliment, because I like that stuff.

By contrast, clarifiED got a lobster bisque, which she described as “watery,” though she was unsure whether or not that was a mistake or an inherent feature of the dish.

On the land animal side of things, Skit, jeff, and A cool pen name all got a burger and fries, which they assessed as a resounding OK. jeff called it “standard,” good but not the best he ever had, while A cool pen name called the fries “decent” and “satisfactory.” She also mentioned that she did not like

lobster and did not really like burgers (you have to open your mouth too wide to eat them, she explained). Skit had a slightly better opinion: he called the fries nice, “like McDonald's fries,” but with extra spice. He also mentioned a bun size mismatch with the burger, which led to an awkward eating angle. clarifiED expressed concern for the narrowness of the planks the burgers were served on, though I didn't hear this from those who ordered them.

cy and girafarig also focused on structural concerns when I asked them about the poutine they had. The bowl was too small, meaning the cheese curds on top could not be mixed in, leading to disappointingly un-melted cheese curds. In food quality terms, girafarig expressed neutrality on all forms of French fries, though he described the fries in his poutine as “restaurant-tier.”

THE DRINKS

From the bar, Skit and Deriving For Dick got the Pacific Sweet Water, which is a lychee liquor based cocktail with sake wine and simple syrup. Both agreed that it was good and tasted deceptively non-alcoholic. Skit wanted a second, but didn't want to overdo it, which was understandable considering it was 3 PM on a Friday. Deriving For Dick called it “dangerously sweet,” and also mentioned that it was his first source of fruit in 4 months, which is not a review, and also concerning.

I got the East Coast Mule, which is a variation on the Moscow Mule, made with Newfoundland rum. The biggest plus here was that it was served in the requisite fancy copper mug.

Several writers also got milkshakes, which also got an average review from our writers. jeff said he “had better milkshakes,” and also described his as “dry.” cy had “no problem” with it, and girafarig did not appreciate the whipped cream that came with his.

One highlight of the milkshakes, however, was the plastic horse-themed cup jeff received his in. clarifiED liked it, and jeff was “distracted” by it, but he believed that the horse cup was not specifically targeted at him. (Every other writer received their milkshake in a normal glass cup with no horses on it.)

The water and water pitcher on our table got rave reviews, with no less than four writers expressing appreciation for it. I have to admit, it did look pretty cool.

THE SERVICE

Skit and Deriving For Dick both expressed appreciation for our server, Lorraine. Skit wanted his statement, “stan Lorraine” on the record. I agree, considering she put up with me and Deriving For Dick being weirdos by ordering two dishes and eating half of each.

THE PROSPECTS

The collected writers were pretty dim on the long term prospects of the establishment. clarifiED, cy, and Skit all mentioned that the place was basically empty when we went. girafarig went even further, saying that the restaurant “feels like it was in decline”, even though it had officially opened a few weeks ago. On further discussion, he noted that most restaurants fail, and I managed to convince him to state on the record that we should return to a manufacturing based economy.

Several more bystanders had notes about this topic: one said that “\$20 lobster rolls were unsuited to the university community,” and another predicted that it would be gone by the time this year's first years graduate.

THE TAKEAWAY

Skit summed up his thoughts: “I would return, not for a date, but for a gathering of up to 12 people, due to COVID restrictions.” After asking the writers present and finishing this review, my impression was that if you want standard-quality restaurant food, but with lobster, at the price that lobster usually is, the Lobster Burger Bar is the place where you can get it. If that appeals to you, you better move fast, because if you trust our business sense, it'll be gone soon.

3 lobster claws / 5 lobster claws, which I guess means you gotta tear a claw off one lobster, since those are odd numbers and lobsters have two claws each

UW Unprint



UNHINGED RANTINGS ABOUT THE LOBSTER BURGER BAR

After gruelingly writing 20 articles for **mathNEWS**, I finally showed up to my first in person prod night. In this spectacular event, I've been told by UW Unprint that he is writing an article about people's thoughts on the Lobster Burger Bar. Unfortunately for him, he decided to exclude my opinion with some weird excuse like “**methNEWS**, you didn't actually go to the restaurant, why are you giving me an insanely fabricated 3 page review of a place you've never been to?” Being the award-winning journalist that I am, I decided to not let that baseless character attack stop me from exercising my God-given right to commit libel against a restaurant. Therefore, here are my unedited, non-proofread, and completely unfiltered thoughts of this so called “Lobster Burger Bar,” if that's even its real name.

Firstly, who in the bankrolled fuck can even afford to eat lobster in this university? Unless someone got a Bloomberg Senior Developer co-op in grade 8, I cannot imagine a single student just being like “Hey I know what I'll get for a cheap lunch today—A LOBSTER ROLL.” In addition, as a person who is currently taking PSYCH101, I am qualified to say it is scientifically proven that no sane person would ever choose to eat in an inferior plaza restaurant when Showerma Plus is just around the corner. Lastly, the main reason for me to distrust this business is religiously motivated. If you didn't know, I am Jewish. Unfortunately, this is a lifelong genetic condition that cannot be cured or helped. This means that I cannot eat lobster, probably because a lobster once clamped Moses in the foot on his way to the Red Sea or something. So, how do the godless sodomites who run the restaurant dare to base an entire franchise on an un-kosher animal within 3 kilometers of where I chose to sublet for this term?? I find the existence of this bar an assault against everything I hold sacred, especially my favourite choice of burger meat.

Thank you for indulging me in my quest for ultimate revenge against a restaurant I've never visited and don't intend to. Please remember to rate this article $\frac{5}{5}$, and donate to the Lobster Protection Foundation. In addition, please ignore UW Unprint's article claiming anything good has ever come out of that restaurant. This man is a satanist editor who is abusing his powers and probably being paid by Big Lobster to perpetuate the myth that lobster is an acceptable burger ingredient.

methNEWS



A SUMMARY OF THE LAST 2 PAGES

PMATH 000

UNIVERSITY OF WATERLOO, FRIDAY—The Faculty of Mathematics has unveiled the first offering of a new course in its pure mathematics degree requirement: PMATH 000. Well known for its strong undergraduate mathematics degree, the university has been met with some skepticism regarding this controversial course.

As with every new course, it will take a while for the student population to get accustomed to these new requirements. But I think, if we go into this with an open mind, this can have a real positive benefit on our community. The applications of the empty set are as fruitful as the set itself, and they're often glossed over in a pure math major's undergrad degree. In fact, most students don't really work with the empty set until late in grad school. So the Math Faculty at Waterloo is trying to streamline that process and make sure our pink ties get the first-class education they deserve.

FORMER UNIVERSITY OF WATERLOO ALUMNI

This was certainly a very big decision. The University of Waterloo, our partner university, has considered this decision very carefully, to create this PMATH000 course, and they have made a decision. We are very glad that they have gone through this process, and that they are in the middle of processing it. It is the mission of post-secondary institutions to innovate, advance, and progress humanity. The University of Waterloo is certainly, you know, an institution.

MERIC GERTLER, UNIVERSITY OF TORONTO PRESIDENT

what the fuck?

FIELDS MEDAL WINNER

The following course description is taken from <https://ucalendar.uwaterloo.ca/2122/COURSE/course-PMATH.html>:

PMATH 000 LEC 0.50

Introduction to the Empty Set

A broad introduction to the trivial examples in analysis, group theory, set theory, differential geometry, and all the rest of mathematics. An in-depth study of the empty set and its underlying properties. Strategies for determining the elements of the empty set are further studied.

[Note: This course will be of interest to all math students.]

Antireq: Every other course offered by the Math faculty.

POST-PRINT ADDENDUM

The author of this article has managed to get ahold of the instructor of the first offering of PMATH 000. The following is a condensed interview with Professor Kennebunkport [PhD: 2021], of the University of Waterloo.

THANKS FOR SITTING DOWN WITH US TODAY DR. KENNEBUNKPORT.

Oh certainly! It's absolutely my pleasure. There isn't much content to prepare for next term's PMATH 000. It's a pretty straightforward course, so I honestly don't have enough work for myself this next little while.

SO CAN YOU GIVE A GENERAL OVERVIEW, FOR OUR READERS, OF WHAT THE COURSE WILL BE ABOUT?

For sure. So the entirety of the course will be based on the properties of the empty set. What it contains—and, more importantly, what it doesn't contain. There are lots of questions that you could ask about the empty set. Let A be the set of all non-trivial solutions to $x^n + y^n = z^n$, where $n \geq 3$. Our course is interested in answering questions like, is A empty?

For another example, let B be the set of non-trivial zeroes of the zeta function that don't lie on the critical line. Again we wonder, is B empty? Or, let C be the set of all problems that can be verified in polynomial time but cannot be solved in polynomial time. This time we must ask: is C empty?

In essence, we really want to bear down on all this basic, foundational stuff that underlies the rest of mathematics, to make sure our students get a good intuition for the empty set. Only then will they be truly ready for higher year math courses.

WAIT, IT SOUNDS LIKE YOU CAN STATE A LOT OF OPEN PROBLEMS IN MATHEMATICS IN THIS RIDICULOUS FORMAT?

Well yeah, I mean, I wouldn't really call them open problems... these are basic, foundational questions that our students should be able to solve. While pure mathematics can seem hard to an outsider, we will make sure to give lots of practice problems so that students are ready for their assessments.

YEAH, BUT JUST GOING BACK TO WHAT YOU PREVIOUSLY SAID, YOU COULD JUST TRIVIALY STATE EVERY PROVE/DISPROVE PROBLEM AS A PROPERTY OF A NATURAL NUMBER $P(x)$ AND DEFINE THE SET $S = \{x \in \mathbb{N} : P(x)\}$ SO THAT SOLVING THE PROBLEM IS THE SAME AS CHECKING IF S IS EMPTY...

We will make sure to cover every possible question regarding the empty set. It's a bit tight, but that's why this course focuses on just the one set, right?

HOW CAN YOU POSSIBLY COVER ALL POSSIBLE QUESTIONS??

No more questions at this time, I think I'm going through a tunnel. Static's cutting out.

Professor Kennebunkport gets up from the armchair across from the author and promptly absquatulates the room.

Senior mathNEWS Journalist

sexNEWS: I'M NOT PAID ENOUGH FOR THIS SHIT

Welcome back to **sexNEWS**, a biweekly column in which I answer relationship advice questions submitted by you, the readers.

As always, feel free to send your questions to mathnews@gmail.com to be potentially answered in this column. Anonymity is guaranteed¹. You're also welcome to include additional information to give context that you don't want included in the article if you're worried that your situation is specific enough that fully explaining it would expose you. This column is not restricted to just romantic relationships, we discuss personal relationships as well.

What should I give my significant other for the upcoming holiday season?

WHILD

Tell them your budget and ask them what they want. Get them that.

And as always, 🗨️COMMUNICATION 🗨️IS 🗨️KEY🗨️

How does one do anal sex?

INEXPERIENCED

I would like to thank the gay and bisexual people who advised me on this question.

I'm going to assume you're on the receiving end because that's the more complicated end to be on. Otherwise take this advice and help your partner follow it.

Lube is very important. Use a lot of lube. You want to work your way up to it, start with small things and go up from there. It will usually hurt the first time, but it will hurt a lot less if you use lube and work your way up starting with small things like fingers (make sure the fingernails are cut, and file them so they aren't sharp).

Use condoms. Eat a lot of fibre. Wash your buttohole.

Especially if you're not in a monogamous relationship you should get tested for STIs regularly. Also talk to your doctor about PrEP. PrEP is a medication that reduces your risk of getting HIV.

Douching can be bad if you don't do it properly, and it's not necessary. You see a doctor about it if you want though.

Other than that, it's not going to be all that different from other forms of sex. Consent is important, and have fun!

And as always, 🗨️COMMUNICATION 🗨️IS 🗨️KEY🗨️

Penetrative sex really hurts. What can I do?

SINCERELY

If penetrative sex is painful for you, and using lots of lube doesn't help, then you should see a doctor.

But what can you do in the meantime while you're waiting for an appointment or following your doctor's prescribed treatment plan?

Besides penetrative vaginal sex, you can try oral sex. Your partner doesn't need to penetrate you to give you oral sex. You can also do hand things (fingering, handjobs). Stimulating the clitoris does not need to involve any penetration.

You should also talk to your partner about what they are going through. If they are good they will be understanding.

And as always, 🗨️COMMUNICATION 🗨️IS 🗨️KEY🗨️

How do I find the clitoris?

A STRAIGHT MAN

Ask your partner where their clitoris is.

And as always, 🗨️COMMUNICATION 🗨️IS 🗨️KEY🗨️

I lost a bet and so I had to say a pickup line to a random person and now my roommates keep teasing me by saying I'm in a relationship with this person.

AN EDGY NERD

You should establish dominance by entering a relationship with this person.

Senior mathNEWS Relationship Correspondent

1. Unless there is a court order or something, but if I foresee that being an issue I probably won't answer the question in the first place. Canada has unfortunately weak laws protecting journalists, and I don't know if this column even counts as journalism.

warSOC XIII — UNLIKELY SAVIOUR

NAME

Softly, swiftly, I unwind the net from the last fallen goose. Its unmoving, limp form lies on the ground for but a moment before its compatriots open wide a Theorem-Space portal beneath it, and all the geese disappear into it. A few policemen are questioning frightened, confused students nearby. Luckily, nobody's paid me much attention; they've been otherwise distracted. I hope the reports don't mention me. A mysterious human figure dashing around rescuing geese? Those Anti-Math hunters would be back for me in a heartbeat.

I walk west, past the Student Life Centre, across Ring Road, over the creek, and into the little park next to the pond by the Health Services building. The night is clear, and the moon shines silver on the dewy trees. On the bench a little away, a couple in autumn browns is kissing.

Which reminds me of Sarah, and how that's where I'm supposed to meet Lucy.



LUCY

The way back takes thrice the time. We have to momentum jump, of course. Flying would have us stuck out here for days, so I have to try not to hurl as we're doing this flapping nauseating in-out dance.

We could migrate awfully fast if we just momentum jumped the whole way. Newton comments between breaths, a moment before we rip back into Real-Space. Rushing wind for a few seconds, then the silence of Theorem-Space.

Brilliant idea, my dear, except for the number of splattered geese on the ground. Not everyone's as good as us. I'm a little snappier than usual. My wings are getting silly sore.



SARAH

So freaking tired. I told myself it was only resting my eyes for a second, but I slip into sleep, or whatever passes for sleep in this broken state of mind. There are dreams in here, dreams inside dreams, like that stupid complicated dream movie.

I dream of Name. She's standing there, in front of me, for a little bit, before turning around and walking away. That's a little generic, I tell myself. But nonetheless, I feel my face warm.

"Are my geese safe?"

The hideous voice of the Magenta Menace rips me out of my dream.

NAME

I make it back to Sarah's hospital bed before Lucy. It's well past midnight, and the hospital's closed. That doesn't stop me: I take Theorem-Space instead, exiting in Sarah's ward, as quietly as I can. The room is dim, and it's only her bed occupied.

I walk over, take a seat. No words today; I'm exhausted. Sarah doesn't look her normal determined self—her face is relaxed, as if she's sleeping. It's well past midnight now. I place my hand in hers, and close my eyes for just a moment...

...

"Are my geese safe?"

Lucy's voice jolts me awake.

"Yes. As many as I could. Your other geese were there to help. I'm sorry, Lucy—not all of them survived." I blink a few times blearily.

"Thank you." Lucy hisses.

"And you'll treat Sarah now?" I grip her hand tighter.

"A deal's a deal, my dear." Before I can respond, Lucy starts something close to a Theorem-Space entry procedure, but subtly different. Lucy's other goose, Newton, stands next to her eyeing her movements. I hold my breath as Lucy continues for another minute, slowly moving her wings in sweeping motions and muttering quiet honks. I can sense something building, of a similar flavour to Theorem-Space and Anti-Math, and for a second, I'm terrified Lucy's here to finish off Sarah. But then she abruptly stops, and turns back to me.

"I'm done, my dear. A little bit of secret Goose magic, and Sarah will be back to normal in no time. In the meantime, I do believe we have some planning to do. I don't think you're happy with the fact those goons still have your warSOC people, and I'm certainly not happy with the way they attacked mine. A common enemy, my dear. And a plan."



SARAH

I hear the Magenta Menace talking, and I'm terrified. There's nothing that I can do, though, but listen. But Name's beautiful voice is there too, and they're talking about me, and Lucy's starting something and coming *into my mind* and suddenly *she's here*.

"We meet again, Sarah." Lucy's standing in front of me.

"I didn't hit hard enough."

“No, you didn't. And that's lucky for you, because I'm about to save your sorry self.” Lucy disappears.

There's nothing for a moment, then brilliance. The cobwebs and entangled mind of Anti-Math is being swept by some outside force with the power of a tsunami buttressed by a hurricane wind, and my mind starts to make sense again.

To be continued...

CC

ALBUM REVIEW: ELIANE RADIGUE'S TRILOGIE DE LA MORT (1994)

A BLURB ON STILLNESS, SLEEPLESSNESS, AND SUBWAYNESS

I wanted to write an album review today. I've had three or four candidates in mind—all long-time favourites—for the past week. However, a new album recently entered my rotation: Eliane Radigue's *Trilogie de la Mort*. People online call it “drone music.” As far as I can tell, it's almost entirely composed of sine waves and microphone feedback. Rhythm goes out the window, as does harmony. It contains three tracks, each lasting fifty minutes to an hour.

It is also worth noting that I've yet to listen to it in full. In fact, I've yet to finish the first track.

Here's some context. On the Thursday before reading week, I was grinding a MATH 147 assignment at CMH. I returned to my room at 3 in the morning, and I fell asleep closer to 4. Little did I realize that I had fucked up.

Every night in reading week, I would lay in bed from 12AM to 3AM, sleepless. I'm aware that others deal with worse insomnia than I do, but for a moment, I was convinced that I'd never have a normal night of sleep again.

But one night, while scrolling through my Spotify library, I found this album. Someone on Twitter had recommended it to me years ago. I was mildly interested by what I heard in a cursory skim, so I left it on and closed my eyes.

I've yet to finish the first track. Without fail, it puts me to sleep.

Granted, it's not actually easy to fall asleep to it. You start by lying there with your eyes closed, but with only sine waves to stimulate your senses, you begin to fixate on small things. This is how drone music operates: quiet becomes loud and plain becomes textured. As the first passage of the first track plays, I can picture small orbs of light, orbiting around each other and fading in and out of view. What are they? Why do they spin?

Why must they be made of light? I eventually doze off, having exhausted my attention.

And dozing off in the middle of a song is like falling asleep on a subway. When you return to consciousness, you realize that the world around you has shifted. No longer can you see those little orbs of light. No longer are there small motifs to latch onto. That was the beginning, and you are now in the middle. There are only solid colours now, shining with infinite intensity and purity.

Sometimes I wake up thirty minutes in. Sometimes I wake up fifty minutes in. I once woke up twenty-three minutes in and felt a huge rush of anxiety—the kind of anxiety that music rarely gives me. The drone was no longer this tiny sound that originated from a tiny object; it was now this cosmic force. It was the subway, and subways don't harbor any love or hate or consideration towards the people sleeping in it. It simply rolls from one end of an infinite track to another. Freaked out, I tore my headphones off and fell asleep in silence.

One day, I'd love to devote three hours to experience the album as fully as possible. I've skimmed through the first track multiple times (both awake and asleep), and I've probably heard every section of it at some point, but I've yet to grasp what it all means. It's as if each stop in the subway ride only makes sense when considered in sequence, and the piece as a whole only makes sense when the stillness of my mind can meet the stillness of its sound. There's a journey to be had here. I just need to be awake for it.

☞

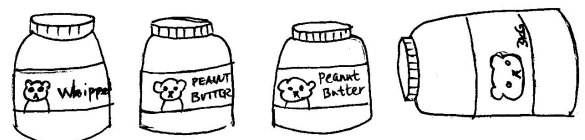
The moral of the story? Don't cram MATH 147 assignments.

χ

N SCENARIOS IN WHICH IT IS SOCIALLY ACCEPTABLE TO, IN A PUBLIC SETTING, LOUDLY VOCALIZE OR CALL SOMEONE “DADDY”

- You are speaking to your father.

quantum goose



jif of the day

I FINALLY GOT A SMARTWATCH AND I'M FRANKLY DISGUSTED AT HOW LITTLE I MOVE AROUND

For the past few months, I have had a very old laptop lying around my place. It had a Pentium 4 and was old enough that it basically ran nothing newer than Windows XP¹. So when the opportunity came up to make a trade, I jumped for it. I had paid zero dollars for this laptop, so anything I got in exchange was basically a free thing for me. What I got was a PineTime.

A PineTime is a \$25 (okay, technically \$27) smartwatch developed by Pine64, a manufacturer of open-source-focused devices. This means that the firmware that runs on the watch is completely open source and free for anyone to use and modify. The watch runs on very low-power hardware, which is what enables it to be so cheap. For context, a typical Android Wear smartwatch costs around \$250–350, and the newest Apple Watch starts at \$399. A PineTime costs a *tenth* of that.

That also means, of course, that it delivers far less functionality. While the other watches are running full-scale mobile operating systems with internet connectivity and apps and whatnot, the PineTime runs InfiniTime, a fork of FreeRTOS. FreeRTOS is an operating system designed for embedded microcontrollers—think, toaster oven operating system. That's the level of processing power we're talking about.

This might seem very limiting, but ask yourself—what have you ever seen a person with a smartwatch do with it? They use it for fitness tracking, getting notifications, getting navigation directions, getting calls, and (occasionally) looking at the time. The PineTime can do all of that... for some definition of “do.”

Most of this functionality (including even setting time) is achieved through “companion apps” that you install on a more powerful device, like your phone or laptop. So the PineTime can do anything as long as both the InfiniTime firmware and the companion app support it. The firmware supports all the things I listed above, but the Android companion app only supports some of those features. There are other companion apps for other mobile operating systems which support more functionality—but it's not the “other mobile operating systems” you expect. The PineTime has excellent support for SailfishOS and Linux via the Amazfish companion app, but I want to use my watch connected to my phone which uses Android, so I'm out of luck there. The Android companion app, Gadgetbridge, is also great, but it doesn't yet support navigation directions with Google Maps... soon, I hope.

So this was a brief summary of the watch—but how is it like to actually use?

The watch I received happened to be a Developer Edition of the PineTime manufactured before June 2021, which means two things:

- It ships with an older version of InfiniTime which has a bug that renders the watch completely unusable until the battery drains out

- The back cover of the watch, which normally seals shut with glue, is *not* sealed shut. Since there are no snapping bits, this means that the back cover of the watch does not attach to the watch at all.

The first issue is fixable—once you charge the battery up enough, you just need to avoid the bug long enough to flash a firmware update using your phone, which will fix the bug. Charging is hard though—the watch charges via a couple of pins which magnetically attach the charging cradle to the back cover of the watch. Recall that the back cover of the watch isn't connected. Wait, what?

Turns out, you can put down the watch on the cradle, and then put a large weight like a mechanical keyboard on top of it, and that will provide enough pressure to connect the charging circuit from the back of the watch to the battery, letting you charge it. Once I did all that, I could just flash the system update and I was ready to go!

Well, almost. This was fine to charge the watch once, but there's no way I can wear a watch where the back cover can just fall off and expose my wrist to bare battery terminals and the watch's circuit board. Recall again that for a normal watch, the battery cover seals shut with glue. A few dabs of superglue later, I had myself a watch!

I'm still getting used to wearing the watch regularly, and using all the features. The feature I've probably used the most is the built-in 2048 game. It's not much, but it's really convenient when you need to kill time in a Zoom meeting. Just turn off your camera so people can't see you swiping incessantly at your watch.

The saddest thing I've seen on this watch has been the step counter. Back in first year, I used to have one on my phone, and clock in upwards of 10,000 steps a day. These days I'm lucky to get 3,000–4,000. I guess this is a helpful hint into why I've gained weight over the COVID Times™. I'm going to try to up this number soon—so if you see me walking around for no reason, I haven't gone insane yet, this is why.

In other news, the battery life is great—I fully charged the watch a whole week ago and it's at 47% right now. Note though that for most of that time the watch was not paired to my phone because I forgot to turn on a setting that re-pairs the watch if it un-pairs. I expect the battery life will be significantly worse with that fixed, but other users report 3–5 days of battery, which is not negligible. I'm okay with charging it once every few days, especially when it takes only an hour or so and I can do it at my desk.

Overall, I've been really happy with the watch, at least for the past week. I'm going to keep using it regularly, and I will say that if you paid more than twenty seven American dollars

(plus shipping and import duties) for a smartwatch, you probably overpaid.

tendstofortytwo

1. I did not try Windows Vista. Regrettably, it is too late now.

A QUICK REVIEW OF THE ENHANCED ONTARIO VACCINE CERTIFICATE



MY HEAVILY REDACTED VACCINE CERTIFICATE

PROS:

- Very nice, standardized layout
- Canada logomark means it's acceptable for international travel
- Important fields (name, DOB, and # of vaccinations received) stand out
- The corresponding verification app is open-source (this is not a joke, <https://github.com/ongov/OpenVerify> is the official GitHub repository and the devs listen to feedback)
- Use of standardized SMART Health Card QR codes means:

- i. It doesn't need an internet connection to be verified (so the possibility of tracking is heavily reduced)
- ii. It can be accepted almost anywhere in North America that does vaccine certificates (except for Manitoba because they use a completely different system, smh)
- iii. It's secured with elliptic-curve cryptography, the best kind of classical cryptography in the world

CONS:

- Inefficient use of horizontal space (two-column layout would scan a lot nicer)

Name / Nom :

SMART Health Card QR Code / Code QR de la carte Santé SMART



Date of birth / Date de naissance :

A CONCEPT OF WHAT A TWO-COLUMN LAYOUT COULD LOOK LIKE

- Not one single page
- The QR code is embedded as a relatively low-res raster image despite vector graphics being a thing for over 20 years now
- The verification app is written in React Native and takes a loooooong time to boot up and an even loooooooooooooooooooooonger time to scan codes
- Why did it take so long for this to come out?

quantum goose

mathNEWS isn't a cult.
 We just lure people in
 with ~~free pizza~~ outings
 to Lobster Burger Bar
 and trap them in ~~our~~
 office the restaurant.

A mathNEWS CULT LEADER EDITOR

TWO HOURS AND FORTY THREE MINUTES TO DIE

A REVIEW

Heads up: this review will contain spoilers. I'm not kidding, before I watched the movie a screen showed up with the hashtag "#notimetospoil" urging me not to spoil this movie, so I'm just trying to do right by Metro-Goldwyn-Mayer Studios Inc. As one last spoiler shield, please enjoy this picture of Daniel Craig from *Knives Out*.



THIS IS YOUR LAST CHANCE TO AVOID SPOILERS.

Ok, good? Let's go.

First, let me acknowledge where I'm coming from here. I am not a Bond superfan. I've only watched the Craig Bond movies, and, full disclosure, I skipped *Quantum of Solace*.

That being said, I am a fan of Craig's tenure as Bond, probably because I grew up with him. The first Bond movie I ever watched in theatres was *Skyfall*, and it was very good. I watched *SPECTRE* when it came out, and it was... less good. Despite that, I was still invested, and I definitely wanted to see how they'd wrap up the Craig era.

On that measure, *No Time To Die* was a success. This movie *feels* like the end of an era, mostly due to some gutsy choices. Despite the name, a lot of folks die in this one. Not just the usual collection of henchmen, but Felix Leiter and Blofeld also meet their maker. If, like me, you haven't read the Bond novels, Felix Leiter might have been just "that guy that was in *Casino Royale* for a bit," but in *No Time To Die*, you really do feel like Bond and Leiter are friends and brothers, and Leiter's death works as a motivation for Bond to finish the mission.

Blofeld's death was less meaningful. He gets one last laugh at Bond, and then is accidentally virus'd to death. I'll chalk that up to how underwhelming Blofeld's motivation was in *SPECTRE*. Still, his death (along with, surprisingly, all of *SPECTRE*), closes the book on this plotline and establishes just how dangerous the new villain is.

Bond's supporting cast also mostly do well in their roles. As promised in the trailers, Ana De Armas' Paloma steals her scene with her "excited new intern" energy, and her

subsequent non-intern-like action skills. Too bad there was only one scene for her to steal.

Lashana Lynch's new 007, Nomi, is less interesting. Her and Bond go through the standard "conflict to grudging respect to cooperation" arc you've probably seen in a dozen action movies before.

The returning characters also get their day in the sun: Moneypenny and Q get a brief "discovering the evil plan" exposition scene. After eschewing these characters in *Casino Royale* and *Quantum of Solace*, the Craig movies have since built them into characters I want to see. In particular, Bond and Moneypenny barge into Q's house right before a dinner date, which adds a little humor to what could be a paint-by-numbers spy movie scene, and reminds us that Bond's sidekicks do in fact have a life outside of him.

The one thing that didn't work for me was the villain. Thanks to *Mr. Robot*, I am forever biased towards Rami Malek, but his Safin just didn't make sense. His master plan, releasing nanobots that are genetically coded to specific victims, is a quintessential Bond plot. But, the rest of it is where it falls down.

He starts off with going after SPECTRE, the villains from the last film. This makes sense, since its established SPECTRE killed his family. But, any Bond villain needs to also threaten *THE WORLD*, and Safin indeed has also coded the nanobots to target millions. The problem: they never explain which millions, and why. There is a brief mention made of "specific ethnic groups" and Safin makes a standard villain speech about how "the masses" just want "oblivion" and don't want to know when they'll die. It doesn't really explain anything.

It's fitting, maybe, that the actual confrontation between Bond and Safin is short. They struggle, Bond breaks his arm, shoots him, and moves on. In the end, it's not really about the villain this time.

Of course, it's about Bond, and the end of his story. I think I've gotten far enough away from the intro to say this: James Bond dying really worked, and I loved it as the ending. The one thing this movie really beats into you is that Bond can't ever really get a happy ending. The opening is Bond making a pilgrimage to visit Vesper Lynd's grave, the first happy ending Bond had stolen from him. Then, his romantic vacation with Madeleine is interrupted (after about five minutes) by armed agents. Bond thinks Madeleine has betrayed him and leaves her behind on a train platform. Later, he reunites with Madeleine but you know it's not going to last. So, going out in a blaze of glory is the only way Bond would go out.

The reason is important too. Bond needs to open a vital silo door to ensure a Royal Navy missile strike can destroy the disease Safin wants to unleash. What's worse, Safin has

poisoned Bond with a version of the nanobots coded to Madeleine (and her child with Bond, which she has been raising in secret). The choice is clear: Bond can survive, like he has for 24 movies, or he can stay behind, open the doors and be killed by the missiles. The consummate survivor dies to save the world and the people he loves.

It's the same for the Craig era. Yes, there were some rough spots, but it ends with a bang. With how bad the theatre industry has suffered from COVID, *No Time To Die* might even save the day.

8 million deadly nanobots / 10 million deadly nanobots

UW Unprint

HOW I GOT INTO THINKPADS

(FOR A BARGAIN, TOO!)

It all started when a friend of mine showed me his ThinkPad T420s for the first time—a laptop that was, at the time, already 8 years old. Naturally, I wasn't expecting much from the Sandy Bridge-era vintage (Intel 2nd-gen core, circa 2011), but I was pleasantly surprised. Upon closer inspection, the laptop was still reasonably thin, light, and cheap, and even had a full compliment of modern ports such as USB 3.0 and DisplayPort. I was impressed with the metallic build of the chassis, and of course took a liking to the ThinkPad's famous classic keyboard. At that point, I decided that my next laptop was going to be a ThinkPad.

Coincidentally, I had just been looking around for a cheap used laptop to experiment with using Linux full time (I had been self-hosting and running my own Linux server for almost a year at this point). Eager to join the ThinkPad club, I began looking for a new used ThinkPad. This eventually resulted in me buying a ThinkPad T430s that came with 2 chargers and a dock, all for only \$200. The 500GB Crucial SSD was a welcome bonus. Freshly upgraded with a new 1080p display and named after Anos Voaldigoad's sword (from *Maou Gakuin*), Venuzdnor was ready to go.

However, old laptops tend to be cheap for a reason, and I was soon about to discover that my newly acquired 430s was no exception. While I had no issue with the older specs of the system (free from the bloat and spyware of Microsoft Windows), it was soon apparent that Venuzdnor was no ultrabook with its 2-hour battery life. While this wasn't much of a big deal for my late-night coding sessions, I knew that soon COVID-19 would be over and that Venuzdnor would not be a viable long-term solution.

Once again, I was looking all over the internet for a used ThinkPad that would serve as my primary laptop. I began by looking at progressively newer models; the T440, T450, and T460 families. However, none of them were worthy

upgrades, as they either did not address the battery problem in a meaningful way, or had price tags higher than what I was willing to pay. Then, I found it. The AMD version of the T470, sold as the ThinkPad A475. It was the only ThinkPad released by Lenovo using AMD's Excavator platform, based on the notoriously slow Bulldozer cores, before they switched to the much faster (and evidently more expensive) Ryzen 2000 ThinkPads. Naturally, this would explain the low price of the ThinkPad A475.

Excited, I snatched one up for \$175 after shipping for a unit that was listed for parts. The listing showed that the laptop could boot into BIOS, and was only missing a hard drive and a charger. Emboldened from my previous ThinkPad purchase, I was determined to get an even better deal on my second one, one that would put any of my friend's "cheap ThinkPads" to shame. This, however, would not be without its issues; one of the batteries had been depleted so far that it would no longer accept charge (the T470/T480 family had two batteries). Thankfully, this was the hot-swappable battery, whose slot accepted up to a monster 72Wh behemoth. To recap: my cheap ThinkPad now had as much battery capacity as a brand-new 16-inch Macbook Pro, while sporting a measly 15W processor (as opposed to the Macbook's 45W Intel and also a discrete graphics card).

I named my new ThinkPad "Kyoto", after the most cultured city in the most cultured country on earth. After a few upgrades Kyoto now has a crazy large battery and sports 16GB of RAM with a 256GB Samsung NVMe SSD. As of the writing of this article, I am currently preparing the retirement of Venuzdnor as I prepare Kyoto to replace it. How long will Kyoto last? We'll have to see, but when that day comes, I sure hope that there will be an updated variant of the Framework Laptop with the latest AMD processors to replace it.

tokyocatboy

OH NO, OUR TABLE!

Our Table! It's broken.

Table breaking noises

Anon

**In math for some reason,
people construct things
but do not build them.**

PROF. DAVID MCKINNON

N GUIDELINES ON HOW TO WRITE GOOD FANFICTION

I've written fanfiction since elementary school, and I've always found it to be a pretty fun hobby. I've also read a lot of fanfiction, at least by average person standards (Fanfic Georg is an outlier and should not have been counted).

Over that time, I've figured out some basic guidelines that I think tend to be pretty good rules to follow while writing. They are as follows:

ENSURE THAT YOUR WORK SHOULD ACTUALLY BE FANFIC

By which I mean; make sure it shouldn't be an original work. You wanna write a romance series set on Tatooine just to reference that it's set on Tatooine? You might as well just make a standard romance set in the middle of a desert. A lot of the time, these types of stories are dragged down by the worlds around them instead of lifted up. A good fanfic usually has its setting and its non-OC characters mean something to the series in a way that couldn't be replicated by just filing the serial numbers off.

KNOW YOUR ORIGINAL WORK

It's usually pretty important to at least know the basics of the original work. While you can always set your fanfic in an alternate universe that has whatever events you need for your story to take place, you don't want to tread the exact same ground as the original work. Otherwise, there's no point for people to check out your series instead of that bit of the original that you just happen to be copying.

GO WHERE YOUR HEART TELLS YOU

The best bit about writing fanfic is that you have no rules! Wanna make Sonic the Hedgehog join the crew of Picard's Enterprise? Go for it! Your mind is the limit, so dream big because you can do whatever you want!

SOME STORIES AREN'T YOURS TO TELL

I'm a cis white dude. I try to mostly stay away from stories that focus on the lived experiences of people who are different from me, and I try to ask sensitivity readers when I'm unsure. Sure, this is fanfic, where its reach is considerably lesser, but it can still hurt to come across work that is casually (and clumsily) racist, homophobic, etc. Sometimes you might just wanna choose a different premise and different characters for your story.

HAVE FUN

The cliché thing to do would be to tell you to forget all the above and have fun. But I don't think that's correct; writing things that actually work, that provide something unique is what makes me enjoy writing most of all. So, while you should have fun, and you shouldn't take any of the other stuff too seriously, you might still want to consider it, not to avoid fun, but to complement it. Enjoy!

Predap

NEW!

Complete the

cheese^½

question: "When is

liven't

The King Jeff version:

pepper

live laugh love ♡ lie languish leave ♡

linger liberate loaf

gingerbread loaf ■

giberate_{goaf}

bingo bango bongo

lingo lango Longo's

Ω lululemon Loblaw's

Overthrow the ~~Westons~~ Weed

Break up the Big 3

LOBSTER et. al.

Want to write for mathNEWS? Come to the next production night! New writers are always welcome!

A mathNEWS EDITOR WHO NEEDS NEW FRIENDS

RIP THIS PAGE OUT AND COLLECT THEM ALL FOR YOUR OWN mathNEWS COOKBOOK Page 5

This one is called "How to Survive Midterm Season", or something like that.

This term, I don't have any midterms. Lucky me! I get to skip midterm season. Although, for me, I've never felt like "midterm season" was a discrete thing. Instead, one or two weeks before reading week, I'd begin to feel like everything was slowly spiraling out of control, and it wouldn't stop until the beginning of the final exam period (which I suppose is "finals season" = coming in a later issue??). So, yeah that's a "midterm season" which lasts for pretty much the entire term. Things are tough during this time, which is to say that things are tough overall. Basic activities like getting out of bed, and cleaning, and of course, cooking and eating, become much harder. At these times, you want to eat something that's filling and easy to make, but not too unhealthy or else it'll make you feel even sicker than you already are. Something like Deriving for Dick's "Steamed Broccoli".

STEAMED BROCCOLI by Deriving for Dick

Ingredients: 1-2 broccoli crowns, 1 cup water

1. Rinse broccoli free of bacteria.
2. Cut or tear broccoli into small pieces.
3. Pour cup of water into rice cooker bowl and set in rice cooker.
4. Put broccoli into rice cooker steamer basket and set in rice cooker.
5. Turn on the rice cooker for 20-30 minutes or until it smells.

"Bone apple tea - This is a recipe that I googled because I'm a no-good-eat-at-all-the-time type of person. Broccoli kind of slaps ngl and for that I wanted to eat it again, even if just by itself."

20-30 minutes seems too long. I could smell the broccoli about 6 minutes in. I totally agree, though - broccoli slaps. It's good for you, and tasty, and steaming is the healthiest (I think) and easiest way to prepare it. I added some salt and pepper after eating the first piece though, sorry. Although I don't eat-at-all-the-time, I do eat garbage food too much during "midterm season" and it makes me feel bad. Sometimes eating something like broccoli makes me feel better instantly because I can pretend that I'm actually really healthy. Look at me, eating all this broccoli.

When I'm trying to work hard, study hard, I tend to procrastinate pretty quickly. I like to get up and tell myself that I'm just looking for something to eat because I am hungry. Of course, I'm just grasping at any excuse to do anything except the thing that I am supposed to be doing. Then on the other hand this has led me to actually become hungry at very inopportune times every time I start studying. And for that, Jeff has a nice recipe.

PEANUT BUTTER TORTILLA by Jeff

Ingredients: Reasonably thin whole-wheat tortilla, peanut butter.

1. Spread peanut butter over one side of the tortilla uniformly.
2. Fold it in half if you want.

"I used to eat this in high school late at night when I got random peanut butter cravings and didn't want the blast of full bread slices, but also felt too dignified to just eat peanut butter out of the jar."



RIP THIS PAGE OUT AND COLLECT THEM ALL TO MAKE YOUR OWN mathNEWS COOKBOOK

RIP THIS PAGE OUT AND COLLECT THEM ALL FOR YOUR OWN COOKBOOK

Page 6

Mmm, peanut butter. I think jeff's recipe is perfect for when you need something that will quell your appetite just enough so that you can actually get to work, and I can take ten minutes making it so I can get the break I want. What I like is that peanut butter itself is very filling in a non-bloat way, and you're avoiding the bloat of bread. It's great and not too unhealthy.



Okay, here's my easy and filling recipe. I ate this far times a week during my first co-op term, when I barely had any time to cook.

FRIED EGGS ON RICE

Ingredients: Oil, 4 eggs, 1 rice cooker cup of rice, Lao Gan Ma sauce

1. Cook rice in rice cooker.
2. In a small-medium nonstick pan, drizzle some oil and crack eggs into pan carefully. Make it symmetric.
3. Turn heat to medium and let eggs fry to your desired level for sunny-side-up eggs.
4. When the rice is done, transfer to bowl about the same diameter as your pan, and mix with generous amounts of Lao Gan Ma.
5. Carefully slide the eggs off the pan and onto the rice in the bowl.

I still make "Fried Eggs on Rice" sometimes now, though nowhere near as often. It's really delicious, and easy to make, but whenever I eat it, what I remember most is how lonely and isolated I was that co-op term, in a city far away from everyone I knew, living for the first time with a complete stranger as a

roommate, who would cook for hours, leaving barely any time in the kitchen for me. You can see why I ate this so much. I'd eat it exactly halfway, with a straight line down the middle, and leave the other half for tomorrow.

University, overall, can be lonely, on both study and co-op terms, and especially around this "midterm season", if you're struggling and have no one to turn to. I made friends in university for the first time in 3A, and what a difference it's been since earlier terms. Here's boldblazer's recipe, a tribute to the support, and convenience, we got from our friends.

MACARONI AND CHEESE YOU CAN ONLY HAVE AT YOUR FRIEND'S PLACE WHILE AT WATERLOO

by boldblazer

Ingredients: 1 boxed mac and cheese (preferably Annie's), 1 green onion, pepper in pepper mill.

1. Using your friend's ingredients and supplies, prepare mac and cheese according to instructions on box.
2. While that is cooking, thoroughly clean the green onion. Starting from the white end, chop it into thin slices.
3. Once the mac and cheese is done, place it in a bowl, and place the chopped green onion on top. Season with a LOT of freshly cracked black pepper.

"At Waterloo, I really wanted to have some mac and cheese every now and then. This was not possible as I would need ingredients I wouldn't be able to finish, like milk. Thus, I could only make mac and cheese at my friend's place, who actually had milk."

This tastes really, really fancy. I don't know if I love the green onion, but the pepper is a plus. Let's just say it tastes like friendship.

RIP THIS PAGE OUT AND COLLECT THEM ALL FOR YOUR VERY OWN mathNEWS COOKBOOK

HAPPY (9 DAYS BEFORE) HALLOWEEN!

gridCOMMENT 147.3

Tis the season to be spooky—OooOOooooOOooH!

Is it because of the day of All Hallow's Eve, you ask? Why of course not, midterms have been upon us. In any case, whoever schedules **mathNEWS** issue release days always makes it awkward to do a themed **gridWORD**, so I hereby declare today to be the *official, very legit*, Halloween prep day. Enjoy!

We had one submission for last issue's **gridWORD**... *ONE*. To say that I'm disappointed is an understatement. My very first article as **gridMASTER**, and this is the welcome I get?!?

[Editor's note: We actually got two more at press time. If you want to make the gridCOMMENT, get your solutions in before 6:30 PM on the Monday before the issue comes out.]

On another note, I have my new favourite **gridSOLVER** (no, I did not just make this word up), whose answer to the last **gridQUESTION** was Jupiter.

This **gridWORD**'s theme is "Spooky Preparations." The **gridQUESTION** for this issue is "Which cheesy couple's costume would you be willing to wear?"

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

eternally puzzled

ACROSS

- 1. Goes with lettuce and tomato (5)
- 3. The days that keep you in suspense for the next **mathNEWS** article (9)
- 7. If you haven't had this pie yet, WHAT ARE YOU DOING (7)
- 8. Spooky scary skeletons send them down your spine (7)
- 9. First part of an interesting way to ask a stranger for candy (5)
- 11. It can get busted (5)
- 13. See Across 14 (3)
- 14. It's before [Across 13] except after [Across 22] (3)
- 15. Circles' forgotten cousins :((5)
- 17. Give right of way (5)
- 18. First part of the holiday that interrupts our reading week (5)
- 20. A type of bond (5)
- 21. AHHHHH you scared me (3)
- 22. See Across 14 (3)
- 23. It can be green in a garden, maybe (5)
- 25. Second part to Across 9. (5)
- 27. It's scariest to us mathies when it's linear (7)
- 28. Tens on tens of years (7)
- 30. This is ____, as hinted by the title (9)
- 31. The scariest answer to "what is 'e' equal to?" (5)

- 24. He somewhat recently replaced mr. orange guy (5)
- 26. What you can lose when recovering from Ms. Rona (5)
- 29. If you see a black one...RUN (3)



DOWN

- 1. What you need to do when solving triple integrals (2,7)
- 2. To mix together (7)
- 3. Tonic and gin, slangily (1,3,1)
- 4. What shapes do, in a supernatural world (5)
- 5. The Ketchup Song's actual title (7)
- 6. Adjective to describe someone with a spicy attitude, spelled phonetically (5)
- 10. Knock, who's there? (5)
- 12. Your fav y2k twins have this last name (5)
- 16. Bye, in Paris (5)
- 17. Rich people boat, that none of us here will ever touch :/ (5)
- 19. In the arms of..., according to Sarah McLachlan (2,5)
- 21. You need to find a good one when getting a pet (7)
- 22. Or, in typing shorthand (5)
- 23. Off-limits topic (5)

1		2				3				4		5		6
7								8						
9				10		11		12				13		
14				15		16				17				
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22				23				24		25				26
27								28		29				
30										31				

lookAHEAD

SUN OCT 24

MON OCT 25

TUE OCT 26

WED OCT 27

THU OCT 28

FRI OCT 29

SAT OCT 30

Tuition and fee refund
deadline — 50%

National Black Cat Day 🐱
Campaigning period for
MathSoc General Election
begins

National Candy Corn Day

SUN OCT 31

MON NOV 1

TUE NOV 2

WED NOV 3

THU NOV 4

FRI NOV 5

SAT NOV 6

Halloween 🎃

mathNEWS 147.4
Production Night
Campaigning period for
MathSoc General Election
ends

Voting period for MathSoc
General Election period
begins — vote at wusa.ca

Cycle #2 Employer
ranking available @ 2 PM

mathNEWS 147.4 released
Cycle #2 Rankings due
@ 2PM

Voting period for MathSoc
General Election period
ends

Daylight Saving Time
ends on Nov 7 at 2 AM —
an extra one hour of sleep!

LAST ISSUE'S gridSOLUTION

A	P	L	E	S	P	I	E	G	R	A	P	H	
M	E	V	T	O	O	D	Y						
E	D	S	H	E	E	R	A	N	O	M	E	G	A
R	T	N	A	M	C	E	P	S	I	L	O	N	E
I	O	T	A	D	U	E	I	N	I	T	A		
C	O	A	L	P	H	A	R	A	I	N	A		
N	A	C	L	O	W	N	C	H	I	P	I	N	T
A	C	L	O	W	N	O	D	I	M	E	H	I	
U	P	S	I	L	O	N	X	I	Z	E	T	A	
D	I	G	Z	O	W	O	D	E	N	L	E	G	
I	T	M	U	O	X	T	U	L					
S	L	A	C	K	I	N	G	L	A	M	B	D	A



JON I REQUIRE SUPERSINGULAR
ELLIPTIC CURVE ISOGENIES

otherNEWS is made
technically possible
by club executives of
the Math Faculty.
I say "technically"
because if they had
sent us more news
this week, this box
wouldn't be here.

THE mathNEWS EDITOR WHO
PUTS THE "NEWS" IN mathNEWS