



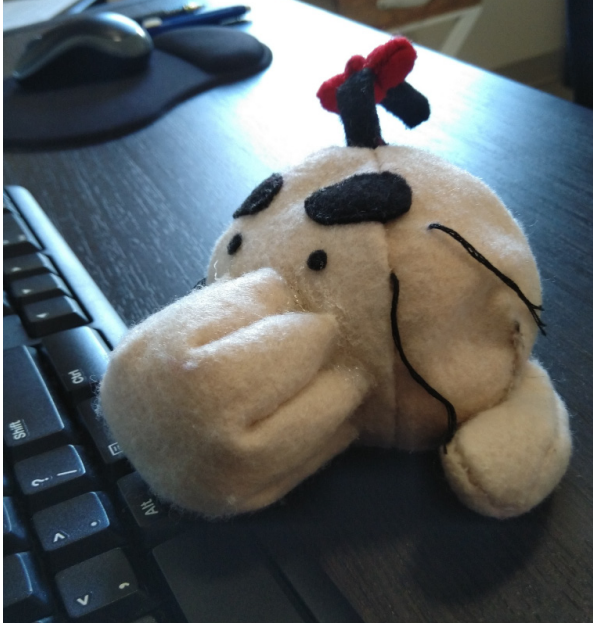
## HAMILTON ARRIVES ON DISNEY+

## "WHAT'S SOMETHING WE SHOULD BRING BACK FROM THE 90'S?"

And so we meet again, dear reader. It has been a long four weeks, but I'm happy to be back here on the **mastHEAD** once more (and to be out of the **gridCOMMENT** for once this term — props to my friend and colleague god ⚡ peED for taking one for the team this issue).

Ahh... I'm really looking forward to playing some old video games when summer break finally comes. Specifically *Earthbound Beginnings*. I finished *Earthbound* and *Mother 3* last month, and I admit that the cultish hype the *Earthbound* series has really is deserved. The gameplay of *Earthbound* and *Mother 3* is really accessible: it's not competitive and there's little strategy involved. The main draw of the games for me was their story, their setting, and their overall tone. Also, I don't think I've ever cried so much because of a video game than when I played through *Mother 3*. Just listening to the "Love Theme" ([youtube.com/watch?v=0pSe2Xh1sMw](https://www.youtube.com/watch?v=0pSe2Xh1sMw)) from *Mother 3* makes my eyes all wet.

Recently my sister sewed me a plush of Mr. Saturn, a character from the games. Isn't he cute?



clarified  
Editor, mathNEWS

god ⚡ peED  
Editor, mathNEWS

**A MATHEMATICAL PSYCHIC AND ASTROLOGER**

A British Hong Kong

**JEFF**

The classic Half-Life mod, *Quake*.  
[Editor's note: This makes me unexplainably angry.]

**ROYAL NO.69 MILK TEA**

The proof of Fermat's Last Theorem

**A COOL PEN NAME**

The collapse of the Soviet Union

**BLANK SHEET**

China not being an absolute dickhead

**FINCHEY**

The GeoCities zeigeist: Textured backgrounds! 3D gifs! The WWW in its infancy!

**CC**

Websites not port scanning your computer when you load them

**ICE NINE**

Websites without advertising and/or the <blink> tag.

**CIX**

Platform shoes (albeit we have already brought them back for the time being).

**QUANTUM GOOSE**

Windows 98. Oh wait, we already did that? Hmm, perhaps something more ambitious than... like... Windows 95?

**PSYCHGIRL**

Websites without asking you to accept cookies every time.

**DERIVING FOR DICK**

The Spice Girls

**SANDWICH EXPERT**

The <marquee> tag

**YUQIAN WANG (MATHSoc PRESIDENT)**

More student engagement at General Meetings

**BOLDBLAZER**

When there was the start of the Korean détente, which led to Korea's only Nobel Prize so far, before the right-wing presidents eventually destroyed it in the early half of the 2010s.

**CLARIFIED**

Mainline *Megaman X* games. (*X9* when, Capcom?)

**GOD ⚡ PEED**

Under the *Avengers: Endgame* theory of time travel, the past is a separate reality, so we should go back and steal all their resources without affecting our timeline.

## ARTICLE OF THE ISSUE

Article of the issue for this week goes to [Failing My First Course at UWaterloo](#) by A cool pen name. Brings me back to my frosh days of putting off vital administrative tasks. In the spirit of appreciating the non material aspects of life, no prize will be given. The real prize is your inner self.

# Boing!

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

# MAKE CHANGES AT THE SPRING 2020 GENERAL MEETING

As you've read from the latest MathSoc email, we are hosting our Spring 2020 General Meeting ([facebook.com/events/2735744420006082/](https://facebook.com/events/2735744420006082/)) on July 25<sup>th</sup>, from 3:00 PM to 6:00 PM (EST). This meeting is an opportunity for you, MathSoc's community members, to review the projects and tasks the executive team have undertaken and to share your thoughts on important topics to the governing bodies. You will also have the opportunity to vote on important matters that will lead the direction for the Society's action. (You have the power!)

If you want to submit a topic for a discussion or a decision, please email them to me ([prez@mathsoc.uwaterloo.ca](mailto:prez@mathsoc.uwaterloo.ca)). We welcome discussion and decisions of any type, ranging from divestment for oil fuels to having more flavoured pies on Pi Day. You have an idea, we'll listen to it.

During this meeting, you will also be electing for two incoming at-Large directors, serving for 12 months on our Board of Directors. The Board is responsible for any contractual and long term projects of the Society. You can learn more on the MathSoc By-laws ([bit.ly/MathSocByLaws](http://bit.ly/MathSocByLaws)) Article 6, found on our website. If you are interested to participate, you can apply at [bit.ly/MathSocBODApp](http://bit.ly/MathSocBODApp).

If you want to learn more about the General Meeting, please visit the info guide ([bit.ly/S20GMInfo](http://bit.ly/S20GMInfo)) or email me directly.

Best regards,

Yuqian (Ina) Wang  
MathSoc President, Spring 2020

P.S. I'm very sorry that I will not be providing food at this meeting, please enjoy these cookies (<https://virtualcookie.com>) as my apology gift.



# FAILING MY FIRST COURSE AT UWaterloo

Waterloo Ready is too hard. For all you upper years who are focused on actual learning and aren't terribly concerned with the agony of being a 2020 frosh—well, you don't even know anything. And it is my public responsibility to use the journalistic power given to me by the **mathNEWS** Gods to shine light on WatReady, which I *definitely* think is probably the hardest course at UW.

Here's how it happened: I woke up on a nice Wednesday morning at 2 p.m., ready to enjoy yet another nine hours wasting my life on Netflix as is natural for a high school graduate during my last summer vacation before university traps me for the next decade or so, but nay. As I passively perused the 1207 unread messages in my Gmail inbox, I noticed Waterloo bugging me to actually register a presentable, hygienic email instead of the dejected junkie that I had been handing out to any shady website that let me play Tetris. Deciding to achieve a solid four minutes of productivity for the day, I clicked the link.

Like Alice falling down the rabbit hole, I doomed myself to the torturous ordeal of setting up WatIAM, Office 365, Outlook, 2FA, UWaterloo Portal (not like I'll be on campus in September, but it's nice to pretend), Piazza, and LEARN.

And that's when I found out that Waterloo had the *audacity* to register me for a course that I didn't agree to and had no knowledge about. To be fair, Waterloo Ready is a fake course without a grade or credit, but I feel violated. Doesn't consent mean anything to anyone these days?

Each week, the course posts a module that is estimated to take an hour to complete. *An hour?* Is free time not a fundamental human right anymore? And don't even get me started on the content. Getting frosh familiarized with UW online systems, helpful advice on time management and note taking, and matching us with upper year mentors—actually... Hm. Well. That doesn't sound too bad.

Okay, so it wasn't the worst idea, and it might actually create a positive influence on new math students who don't have the connections or in-person opportunities to properly transition to university. But I'd rather be placed at the mercy of the UW geese than be caught genuinely endorsing something and breaking the satirical persona I use to hide all my insecurities, so allow me to conclude this article with some very tasteful humor and quality writing:

Haa WatReady sucks diCK.

A cool pen name

# IT ALL STARTS WITH A QUESTION: PIAZZA AS A DATING SITE

Presenting the next candidate for dating site stardom: Piazza!

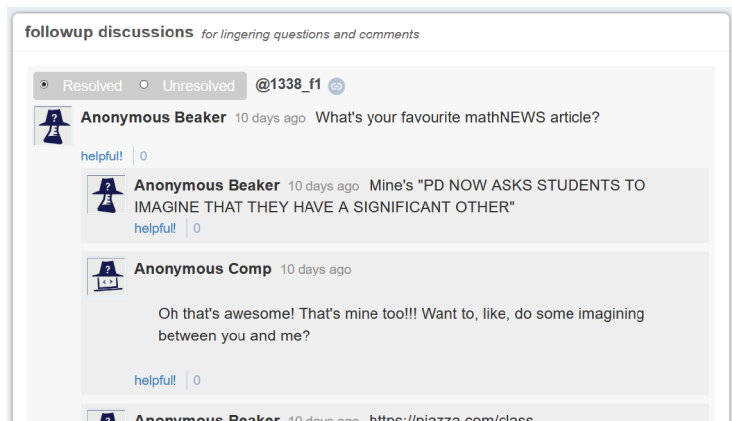
Piazza is an innovative question asking/answering forum that's all about anonymity, and anonymous question asking allows for people to meet each other and interact in the purest form. Gone is any consideration of appearance, mannerisms, and even names—only pure textual discourse.

Getting to know people is all about asking questions, after all! Some good questions to ask include...

- What are your hobbies?
- What is your favourite **mathNEWS** article?
- What's your favourite flavour of pi?
- In the definition of a bipartite graph, we divide nodes into two sets A and B, and all edges join a vertex in A to a vertex in B, so what is the maximum number of edges in a bipartite graph with  $n$  nodes in A and  $m$  nodes in B, assuming the graph is not a multigraph?

Try asking these on Piazza!

When you interact on Piazza, you discover peoples' minds first. Text only communication—nothing else—allows you to get to know people on their innermost, deepest level first, removing all other factors to reveal if you connect on the highest platonic level.



Once you find someone you connect with on that level, you can do a “Piazza Reveal” with them: both of you post non-anonymously to reveal your true identities, and go from there!

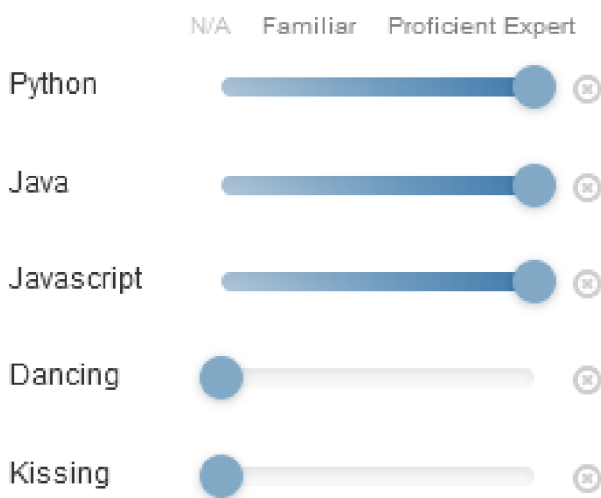
Piazza is also moving towards adding more features to enhance its capacity as a dating site. Piazza Talent Solutions is one existing matchmaking add-in for our favourite question-asking website which seems designed to test out dating site features in a discreet, professional manner.

A profile feature exists, allowing you to publish the most attractive parts of yourself for “companies” to match with. To access your profile, click on your profile picture in the top bar. It's not quite visible to anyone but companies at the moment, but Piazza surely has some more matchmaking features coming down the line!

Coding since the age of 7

Edit

## Skills

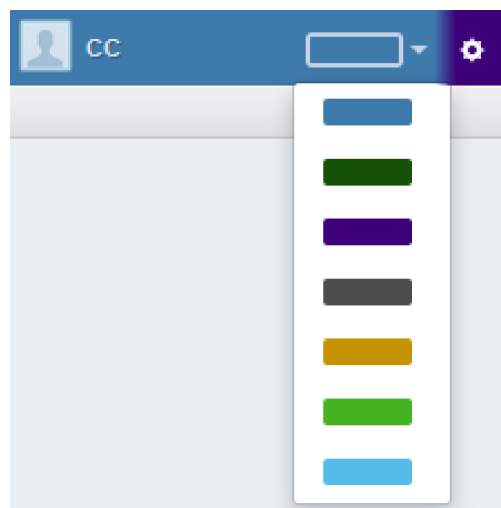


Relationships are built on questions, after all. It all starts with a “Would you like to go on a date with me?”

Or maybe, these social-distanced days, “How about some virtual dinner?”

CC

P.S. Did you know you can change Piazza's theme colour?



# N MORE 'AVATAR: THE LAST AIRBENDER' REFERENCES

*Avatar: The Last Airbender* is my favourite TV series of all time! So I created a list of awesome ATLA quotes but modified so that I don't violate Policy 71. I also tried to make them relevant to the current circumstances of the world... I hope you enjoy!

- Sokka: "My first-year courses turned out to be online."  
Zuko: "That's rough buddy."
- Everything changed when Covid-19 attacked
- A student from China: "I'm unable to access course material online cause of my country's firewall, what do I do?"  
Me, an intellectual: "SECRET TUNNEL! SECRET TUNNEL! Through the VPN! Secret, secret, secret, SECRET TUNNEL!"
- The Physicist has invited you to the Two-Dimensional Universe.  
There is no escape velocity for 2D gravity.  
Here we are safe.  
Here we are bounded.  
*[Author's Note: I got carried away with the Dai Li meme, I'm not sorry for it.]*
- President Feridun has invited you to Lake Columbia.  
There is no depression in UWaterloo.  
Here we are safe.  
Here we are free.
- President Feridun has invited you to Lake Columbia.  
There is no anime war in the subreddit.  
Here we are safe.  
Here we are weeps.
- President Feridun has invited you to Lake Columbia.  
There exists a delta greater than zero.  
Such that for all epsilon greater than zero.  
Here we memorized the implication which holds true.
- Professor Graeme has invited you to the Kernel.  
There is no non-zero vector that maps to zero.  
Here we are linear.  
Here we are injective.
- Leibniz: "You've beaten me at my own discovery."  
Newton: "Don't flatter yourself, you were never even a discoverer."  
*[Author's Note: #MathWasDiscoveredNotInvented]*
- Azula always lies.  
Azula algebra lies.  
Azula lie algebras.  
*[Author's Note: This is trivial by the commutative property. QED.]*
- Master Piandao: "You should go by Lie. There are a million Lie's."
- It's a long long way to Ba Sing Se.  
But the proofs in the city, they look so pretty!

- Roku: "Listen carefully, a second wave will return by the end of this summer. And Covid-19 will use its power to finish the pandemic once and for all. If it succeeds, even the Avatar won't be able to restore balance to the world. Aang, you must create a vaccine before the second wave arrives."  
Aang: "But I haven't even graduated Biomedical Sciences yet. Not to mention the years of experience I need in the field of immunology—"  
Roku: "Creating a vaccine takes years of innovation and rigorous testing. But if the world is to survive, you must do it by summer's end."

*A Mathemagical Psychic And Astrologer*

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## AT LEAST THERE IS ONLY 12

I think it's safe to say that 2020 will be one of the worst years to go down in history, and that we all can't wait for this year to end. It seems each month there's just another crisis, panic, or disaster that appears out of nowhere like a time traveller that really messed things up (accidentally or not) trying to fix the past.

At least let's be thankful that we ended up with a 12 month Gregorian Calendar, rather than following the Lunar Calendar. There is a leap month this Lunar year, making it 13 months instead of 12.

*boldblazer*

PS: 1312

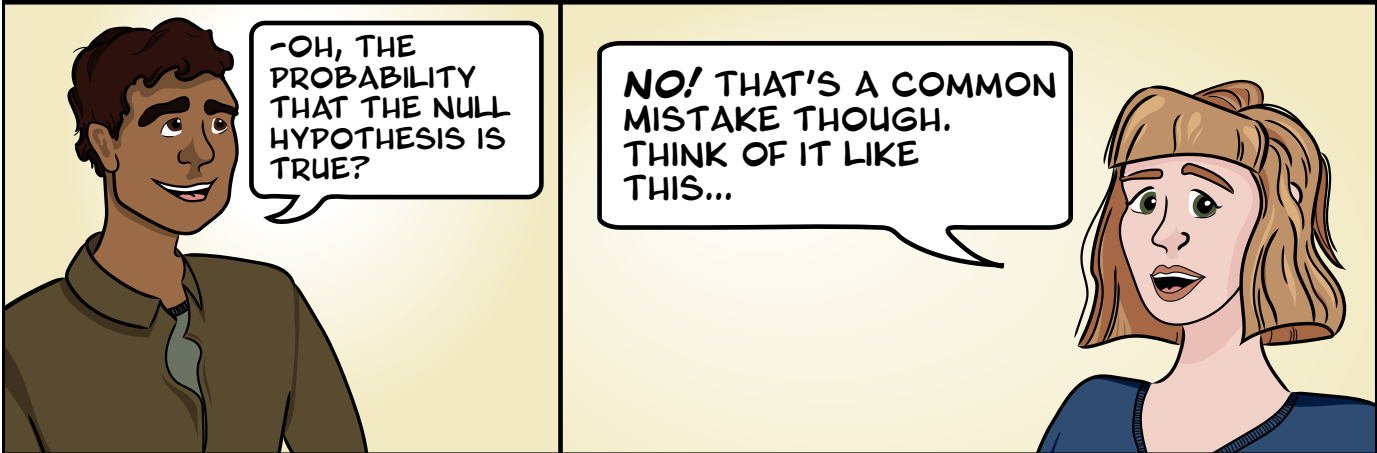
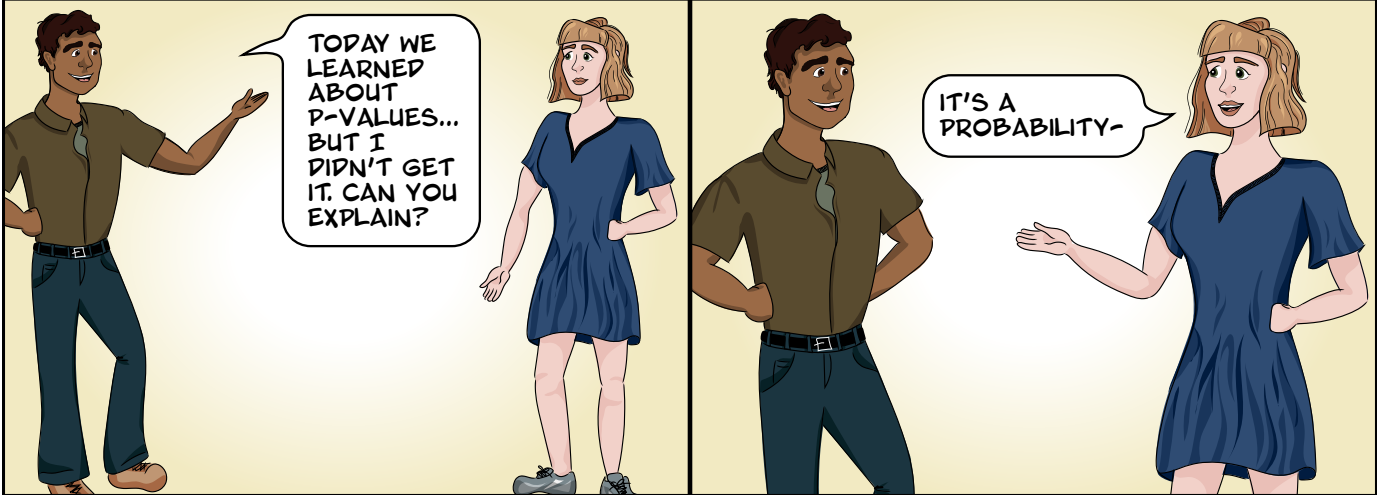
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## EPISODE 5: STAT 231 P-VALUES

On the next page, enjoy episode five of MathSoc's educational cartoons series: STAT 231 P-Values! This cartoon attempts to clear up important misconceptions about this critical concept. If you have any feedback please email Gavin Orok at [gjorok@uwaterloo.ca](mailto:gjorok@uwaterloo.ca) or fill out the following survey: [https://bit.ly/cartoon\\_feedback](https://bit.ly/cartoon_feedback). For each unique educational cartoon we produce that you give feedback on through this survey, your name will be entered in a draw. At the end of the term one person from this draw will be chosen to win a \$25 gift card prize!

Gavin Orok

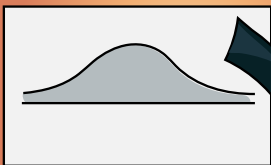
# STAT 231: P-VALUES



...SUPPOSE THAT THE NULL HYPOTHESIS IS TRUE.

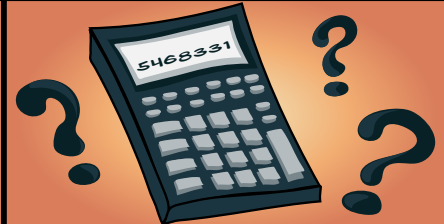
SAY WE USE THE TEST STATISTIC  $D$  TO MEASURE EVIDENCE AGAINST  $H_0$ . LET  $D$  HAVE VALUE  $d$  FOR A DATASET.

WHAT'S THE PROBABILITY OF OBSERVING A VALUE OF  $D$  AS HIGH OR GREATER THAN THIS  $d$ ?



DATASET

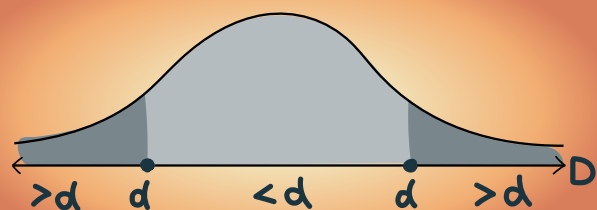
$$d = D(\text{DATA})$$

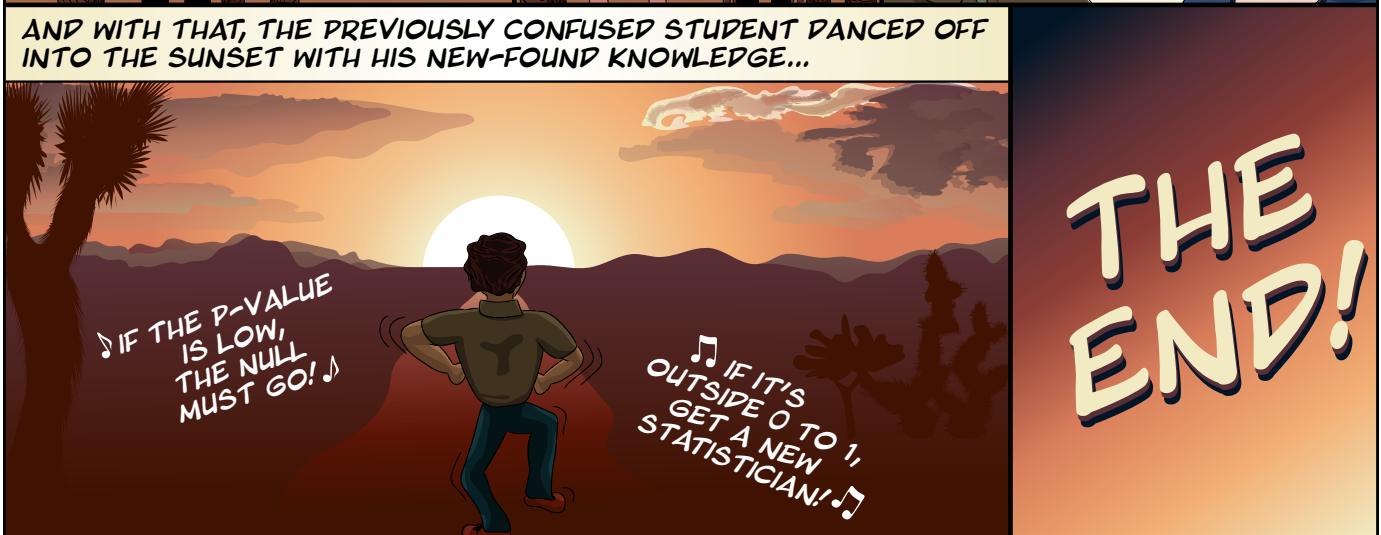
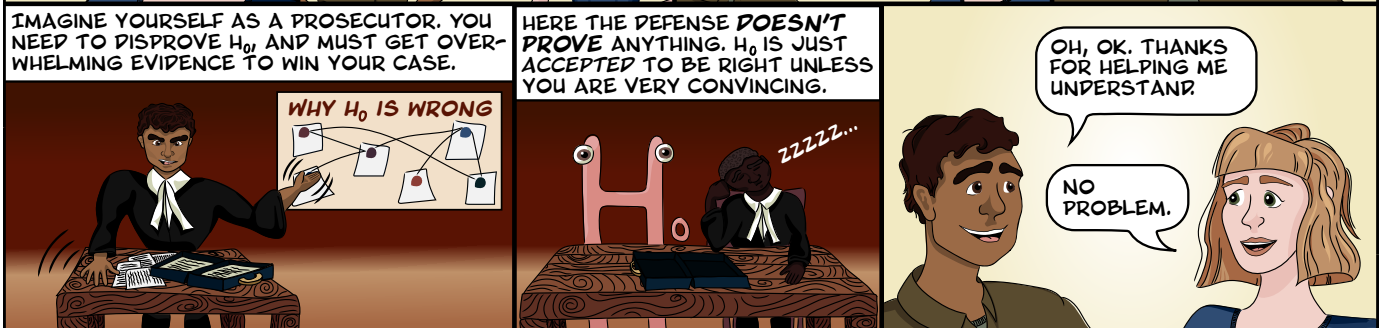
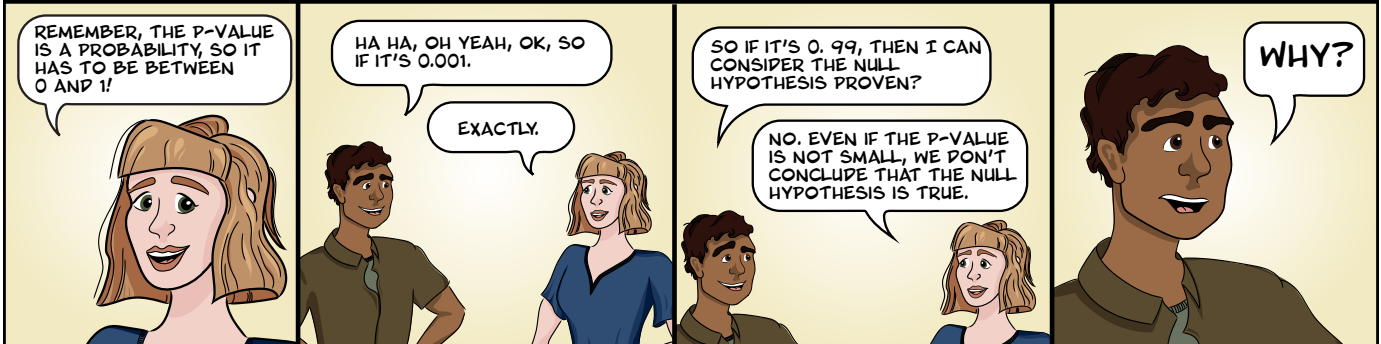
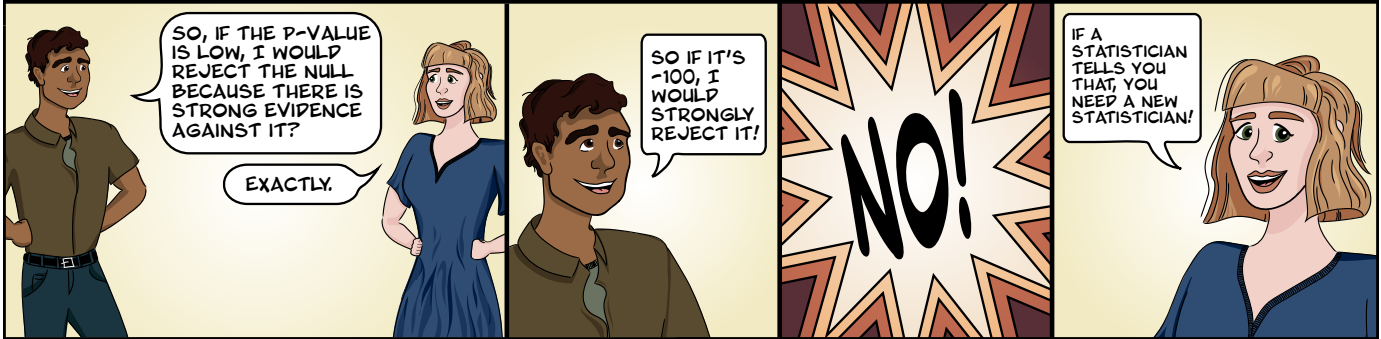
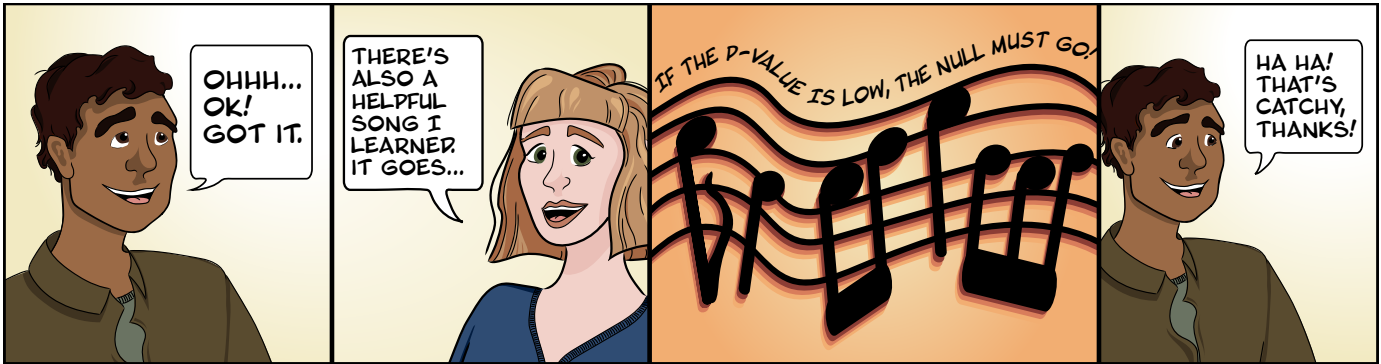


THIS PROBABILITY IS THE P-VALUE.



ON THE STANDARD NORMAL DISTRIBUTION, THE SHADED REGION REPRESENTS THIS PROBABILITY (FOR A 2-TAILED TEST). DATASETS HERE HAVE TEST STATISTIC VALUES  $\geq d$ .





# FREE THOUGHTS ON SOME SONGS FROM HAMILTON: AN AMERICAN MUSICAL

On a brisk, glorious November day in 2019, my friend and I waited in a virtual queue of at least thirty thousand people (we were around 29,000<sup>th</sup> in line) for three hours so we could purchase tickets to the incomparable Lin-Manuel Miranda's *Hamilton: An American Musical* at the Ed Mirvish Theatre. My friend managed to get us the coveted tickets after 3 hours of waiting in line (bless her and her infinite patience), and it was the highlight of my week. However! Just as COVID-19 cancelled everything else, Mirvish is closed until further notice. On the brighter side, I can now watch the Hamilton movie on Disney+ for the affordable price of like <\$3 (if I split a subscription with someone), AND I'll be seeing the original Broadway cast. Waiting 3 hours and spending \$109.99 + tax was definitely a strategic mistake.

Anyways, onto what I came here to do:

(Disclaimer: when I mention someone by name, I am always referring to the character and not the historical figure. The Founding Fathers themselves were problematic, and some of these characters aren't exactly wholesome either. Do not try to be like them.)

## ALEXANDER HAMILTON

I like to think of this as the tl;dr on Ham's life; where he came from, what he did, and how he died. Also loving the fact that Ham's life is told by both his loved ones and his enemies alike; this ties into the musical's theme of legacy ("who tells your story?"), and we find out right away that everyone ends up telling Ham's story! Kinda wholesome ngl. What I find really cool is that this song poses the question that the entire musical attempts to answer: how does Alexander Hamilton, bastard, orphan, etc etc, become a hero and a scholar? We'll come back to this when we get to "Non-Stop" and "Who Lives, Who Dies, Who Tells Your Story." Anyways, great exposition.

Remarkable lyrics:

- "And there's a million things I haven't done / But just you wait, just you wait" (Ham really tried to do everything, as evidenced by the rest of the musical. Also I had this quote as my Facebook bio from Gr.11 until well into first year, but that was more of a commentary on my tendency to procrastinate.)
- "And Alex got better but his mother went quick" (Not poetic, but every time I listen to this song I mishear "quick" as "quack." I have a 60 year old's sense of hearing.)

## MY SHOT

Ham bares his teeth and ambitions in this song, and makes some friends. I don't think I can give a commentary that does this song justice, so I recommend actually listening to it or taking a look at the lyrics. But the main takeaway is this: Ham will take any opportunity he can get to rise up and make a name for himself—not "throwing away his shot." Which is a little prophetic, if you've seen/listened to the rest of the musical and know that "throwing away one's shot" also means aiming at the sky instead of at the person you're supposed to duel...

Remarkable lyrics: too many, but here's a few that I really like:

- "Scratch that this is not a moment, it's the movement"
- "I'm laughin' in the face of casualties and sorrow / For the first time, I'm thinkin' past tomorrow"
- "I never had a group of friends before/I promise that I'll make y'all proud" (Shout out to my friends, the second half of this is how I feel towards you guys <3)

## FARMER REFUTED

I skip this song every time I listen to the soundtrack because otherwise the second-hand embarrassment I feel for Samuel Seabury will cripple me for good. Seriously, Sammy, read the room.

Remarkable lyrics:

- Not a lyric, but the parallel between "For shame" and "For the revolution!"

## WAIT FOR IT

One of my two favourite songs in the musical (the other one is "The World Was Wide Enough"). This song to Burr is "My Shot" to Ham, in that they both explain their worldview and how it informs their actions: Ham takes action because he feels like he's running out of time, and Burr waits. Here's an exercise for the reader: unlike Ham, why does Burr not feel like he's running out of time? If you accept this parallel, you might also notice that Ham's song features Laurens, Lafayette, and Mulligan, whereas Burr literally delivers the musical version of a soliloquy (is that still a soliloquy? Sadly I'm not a theatre kid) in "Wait for It". Someone get this man some friends, please.



Remarkable lyrics:

- “Love doesn't discriminate between the sinners and the saints / it takes and it takes and it takes” (Love is such a heavy theme in this musical. In this song it's juxtaposed with death, since the same lines show up later in the song with “love” replaced by “death.” These lines are also @ you all: you will have love no matter what.)
- “I am the one thing in life I can control... / I am inimitable I am an original” (Inspiring lyrics and true words, but it always puzzles me that the conclusion that Burr derives from these stunning revelations are to wait. Burr, come on.)

### YORKTOWN (THE WORLD TURNED UPSIDE DOWN)

One major goal of Ham's is to prove himself in a position of military command, and he gets that in this song and does pretty well. Not only is Ham having a pretty good time here, so are our main characters and the Continental Army because they ACTUALLY beat the British, and turned the status quo of British dominance upside down. Maybe it's also a reference to “the world will never be the same” from “Alexander Hamilton”? Hmm.

Also, “Yorktown” has the most satisfying use of the F word in the entire musical. A well-deserved shout out to our homeboy Hercules Mulligan.

### NON-STOP

tl;dr: Ham does a lot of things in short amount of time, such as writing 51 articles defending the US constitution under a pseudonym. (This man would be the ideal **mathNEWS** writer.) And I'm writing this article like I'm running out of time because articles for this issue are due in less than 4 hours. The fact that this is the longest song in the musical—at 6 minutes and 25 seconds, beating the runner up (“Satisfied”, surprisingly) by nearly a minute—probably means something too.

A bit earlier I brought up my opinion that “Non-Stop” answers the question posed in “Alexander Hamilton”. It seems like “Non-Stop” explains it pretty well: Ham leaves behind a legacy as a hero and as a scholar because 1) He fought in the Revolutionary War; 2) He defended the US constitution; and 3) He was the first Secretary of the Treasury. Are those all of the reasons? No sir, or else the musical would've ended here, where the squad went back to New York and lived happily ever after.

Also in this song: Ham and Burr have an ideological clash. Spoiler alert: this happens in nearly every song in Part 2 of the musical.

Thank you for coming to Part 1 of my TED Talk.

royal no.69 milk tea

## THE WEEKLY PUZZLE CHALLENGE

Get your thinking caps on, the Math Student Life Team in partnership with MathSoc present the Weekly Puzzle Challenge Here is this week's puzzle. For more details, the submissions form, and a list of rules visit <https://bit.ly/UWPUZZLE>. Each correct solution submitted before the deadline will give participants an entry into our prize raffle for a \$50 Amazon e-gift card (must be a registered UWaterloo Faculty of Math student to be eligible for the raffle).

### JUST SUBTRACT ONE THOUSAND NINE HUNDRED

**Cocoa-coloured Optic Female** is released.

A tiny pace followed by a massive jump.

“Test-Tube Kid”

America consumes a new kind of Apple in their homes.

Movie-goers attend a new club at 8AM.

The “King of Pop” walks through the Graveyard.

This American cartoon family debut by roasting on an open fire.

The Math Student Life Team

## profQUOTES 143.4

### PMATH 320: BEN WEBSTER

“ COVID doesn't have icosahedral symmetry. I don't know if we should be pleased or disappointed about that.

“ When I was younger, [Paul Erdős] was a living legend. Well he died, but he still remained a legend.

### CS 251: ROSINA KHARAL

“ I'm sorry my volume sometimes shoots up as I've noticed watching some of my videos again. I'll try not to get excited about branch control bits and all that kind of stuff [...] I'm sorry if that hurts your eardrums.

It's very difficult to fit a good joke on just two lin

A SPACE CONSCIOUS blackBOX

# HOW TO CREATE A COMPANY THAT CO-OP STUDENTS THIRST AFTER

After my co-op term at [REDACTED], I received a survey about what they can do to improve their co-op program. I ended up writing a behemoth of a guide to improving their program, and I wanted to share an exclusive look at the generalized version with **mathNEWS**. I kept this generalized because 1. I didn't want to break my NDA but also 2. I think all companies and students can benefit from treating their co-ops well. In some aspects, this is a zero sum game so the best tips will be withheld for [REDACTED]. ;)

However, remember that the very basis of this guide is specifically geared towards the company I worked at. I sincerely believe [REDACTED] has a chance to become a top company in its field and by improving, its program, my resume will passively improve with it (similar to how people who worked at North suddenly found themselves with Google on their resume after the acquisition).

The most important factor to improve is **reputation**. Sure getting paid Googlebux is great, but c'mon, that flex is really what we're chasing after (though, part of that flex comes from people knowing how much you're paid... But if you think about companies like Jane Street and Citadel that pay MAD cash, most people don't really know them except insecure CS degens [like me, who would spend time writing about companies {is this even how you're supposed to do nested parens??}]).

For some companies, reputation comes easy because their products are so embedded in our daily life. Obviously, FAANG is the go-to example here. For most companies though, they aren't consumer facing (that's why no one really knows SAP but their market cap is a tidy 160 billion). To be fair, most of the time you wouldn't really be flexing on layman who never heard of SAP in their lives. As such, companies such as Jane Street and Citadel have done well for themselves despite not having any "normie" customers. As such, they actually represent success as us thirsty CS kids have heard of them and wanna work for them oh so bad.

So how do you attain such prestige?

## 1. HACKATHONS

Hackathons provide exposure to lots of students. In addition to booths, many hackathons also have companies do teaching (e.g. your company can host an introduction to X technology session). Using Hack the North as an example: ~1500 students were in attendance.

Hackathons filter for students. First, the students who attend these events would have the baseline motivation to apply and participate in the first place. Second, the event organizers themselves would filter students based on resume and personal statements. Thus, the talent pool would be fairly decent. Lots of students would be looking for opportunities.

And honestly, most of these kids thirsty enough to attend hackathons are pretty thirsty for internships.

Your company can also consider sponsoring prizes. Not too sure what the ROI is like but back at a hackathon I definitely remember [REDACTED (different redacted from before)] because they sponsored a \$750 + other good shit prize even though they're some no-name music-related startup (I wasn't paying too much attention to finding jobs because I was working but if I were on a study term, I probably would've applied just cuz they're rich enough to sponsor that kind of prize... Really beat out G's lame backpack).

## 2. INFO SESSIONS

Many schools allow employers to host info sessions, allowing for dedicated time to sell [REDACTED] to students. If possible, ask interns to host these sessions at their schools. For example, past interns from schools such as U of T, UBC, McGill, and Waterloo can host sessions in their schools and spread the word.

Even though a lot of students would come for the swag and food, many would stay if your company is lit (kinda like when you meet someone, you like them for the way they look, but you stay for the personality).

## 3. COMPENSATION AND BENEFITS

You can do everything right but if you're that company infamous for paying \$14/hr, you won't really make it that far. However, if you're out there paying like \$35/hr in Kitchener or higher, flex that shit.

## 4. INTERN EVENTS AND SWAG

Intern lunches, hangouts, etc. Students really get to meet a lot of cool, like-minded people working at the same company, and they'll be happier with their time at your company as a result.

Also cool swag is almost essential. Even if everytime I see someone with a Google or Jane Street backpack, a small part of me dies. For smaller companies, this kind of free advertisement is definitely a no-brainer

## 5. APPROVE PROJECTS

Big companies always make sure interns get the lit projects because that's how you bait in these kids. Don't be known as the company that posted a "dev" position where the co-op only did manual QA.

Honestly, having a talent pipeline starting with co-op is essential. A lot of students at least break even in terms of value and in the future, attracting talent is probably the hardest part about scaling a business. Students come in with open minds and fresh ideas, and full-timers probably love having someone to teach.

I've written a lot and looking back, I wonder why I wrote all this (probably sound like a wagecuck but hey, I probably am one). So let's just end off with this: hire me plz.

Gradient descent

# elseWHEN: mathNEWS DID IT FIRST

In the context of the anime and manga craze taking the /r/uwaterloo subreddit by storm, I, as a former editor of **mathNEWS** decided to dive back into an article I knew about from v110i2. Back then, a student drew these 4koma comics showing chibi/anime-tan versions of Imprint and **mathNEWS**.



What I'm saying is, we did it first losers!

# RANKING CAMPUS NEWSPAPERS BY THEIR SSL LABS SCORE

The title of “best university newspaper in Canada” is a crown that everyone wants but no one has. Over the years, many have attempted to provide an objective metric to rank campus newspapers, from breadth of content, to age, to investigative clout. None have managed to produce a definitive first-place winner.

However, there is one method that has hitherto never been considered: ranking via the SSL Labs score of each paper's website.

For those who are unfamiliar with it, SSL Labs ([www.ssllabs.com/ssltest/](http://www.ssllabs.com/ssltest/)) is a free service that assigns letter grades to websites in accordance to how secure their HTTPS implementation is. For example, a website that scores an A can be expected to use a secure, valid certificate and have all major vulnerabilities patched, while a website that scores an F is likely to be susceptible to multiple vulnerabilities. SSL Labs assigns grades based on numeric scores in four categories: certificate trust and security, protocol support, key exchange, and cipher strength. If you're interested in learning more about what each means and how the final score is calculated, you can find the detailed documentation on GitHub<sup>1</sup>.

Thus, I present to you: The definitive ranking of Canadian campus newspapers, by SSL Labs score.

(Disclaimer: I did not go through every university newspaper in Canada, only the ones that looked big enough.)

## A+: THE BEST OF THE BEST

### mathNEWS (UWATERLOO)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) A recent upgrade has yours truly offering the strongest in online security. Secure cert? Check. All patched up? Check. No insecure implementations? Check. What really sets **mathNEWS** apart, however, is the implementation of HTTP Strict Transport Security (HSTS), a standard that tells browsers to automatically connect to HTTPS. Heck, your connection with us is probably more secure than your connection with your bank.

## A: REALLY, REALLY, GOOD

### THE ARGUS (LAKEHEAD)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) *The Argus* gets a coveted A rating for doing everything right. They also support TLS 1.3, the newest version of the standard, which gives them extra props.

### THE STRAND (UOFT)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Although not strictly a UofT campus newspaper (they're under Victoria University), *The Strand* is big enough that I'll count it here. Like *The Argus*, they too support TLS 1.3.

### THE XAVERIAN (ST. FRANCIS XAVIER)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Not many may have heard of this tiny university hailing from Antigonish, Nova Scotia, but it punches well above its weight on the international stage. Its campus newspaper also punches people trying to snoop on your connection with strong security and, in a common theme with many of the others in this category, support for TLS 1.3.

### THE BOUNDARY (UOFT)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) The unofficially-official student satirical newspaper of UofT, these guys pull no punches when it comes to their satire—or their security, as their A grade and support of TLS 1.3 will tell you.

Interestingly, *The Boundary* is the first newspaper here that *doesn't* use a Let's Encrypt certificate. Instead, they use a certificate from Sectigo, formerly known as Comodo.

### THE MARTLET (UVICTORIA)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) I have no clue what a martlet is or refers to. [Editors note: Google tells me its a stylized heraldry bird?] What I do have a clue about, however, is that they care about the security of your connection to their servers, what with being in this category and supporting TLS 1.3.

At this point, you may be wondering if **mathNEWS** supports TLS 1.3. That's a footnote<sup>2</sup>.

### THE GAZETTE (WESTERN)

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Professor Ross Willard's least favourite university has a lot that one can laugh at. Unfortunately for Professor Willard (and fortunately for us), the security of their student newspaper is nothing to laugh at.

Fun fact: *The Gazette* is unique among Canadian campus newspapers in that it runs on a commercial CMS hosted in the States. One wonders how much money they have that they could afford to do that.

**THE CORD (LAURIER)**

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Laugh all you want at Laurier too, but you can't deny their student newspaper knows their stuff when it comes to ensuring the security of your connection.

**QUARTIER LIBRE (UdeM)**

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) *Très bien*. Sorry, that's all the French I know. unsophisticatED, please forgive me.

**THE SILHOUETTE (MCMASTER)**

(100% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Unlike their name, *The Silhouette's* security measures are definitely not a shadow of what they could be. An A grade here just proves that they're on top of their stuff in this theatre.

**B: COULD BE BETTER****THE GATEWAY (UALBERTA)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) If Jason Kenney were the devil, then perhaps it would be cause for celebration that *The Gateway* supports the insecure TLS 1.1 protocol, for it means your soul might have a chance to break out of a connection to Hell. However, seeing as Jason Kenney is not the devil, we can only lament that *The Gateway* could do better when it comes to its website security.

**DALHOUSIE GAZETTE (DALHOUSIE)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) My dad used to go to Dal. Okay, not really, he actually went to TUNS, but that then merged into Dal, so technically he went to Dal I suppose... oh wait, you could hear what I was saying all along? Perhaps it's because the *Dalhousie Gazette* still supports TLS 1.1.

**THE CHARLATAN (CARLETON)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Though they may speak the truth in their journalism, charlatans the *Charlatan* seem to be when it comes to ensuring your online security, as they still support TLS 1.1 and the even less secure TLS 1.0.

**THE FULCRUM (UOTTAWA)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) If you paid attention in physics, you might remember that a fulcrum is the point on which a lever pivots. Unfortunately, *The Fulcrum* doesn't get much leverage in these rankings— not only do they still support TLS 1.0 and 1.1 (a common theme here), they also offer an expired additional certificate which they should *probably* remove from

their servers. Mechanical advantage they may have, security advantage they do not.

**THE UBYSSEY (UBC)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Recently, *The Ubyyssey* has been at the forefront of reporting on online proctoring services, raising security and privacy concerns alike. If only they also paid attention to the security and privacy ramifications of their own website's continued support for TLS 1.0 and 1.1. But props to them for having TLS 1.3 enabled, at least?

**THE GAUNTLET (UCALGARY)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) You might be running the gauntlet here when you visit *The Gauntlet's* website, what with supporting TLS 1.0 and 1.1. Just like *The Ubyyssey*, however, they also support TLS 1.3. Someone needs to check their server configs.

**THE PEAK (SFU)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) The peak of journalism at SFU is unfortunately not the peak of security at SFU, as evidenced by continued support for TLS 1.0 and 1.1.

**THE MUSE (MEMORIAL)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) One can muse all they want on whether supporting outdated versions of TLS really poses a security risk, but the hard truth is that SSL Labs considers it detrimental to the security of your HTTPS connection, as it has in outing *The Muse* for supporting TLS 1.0 and 1.1. Amusingly, *The Muse* is one of two campus newspapers to use Cloudflare, which apparently also comes with the benefit of TLS 1.3 support.

**THE MCGILL TRIBUNE (MCGILL)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Like *The Muse*, these guys run Cloudflare, which gives them TLS 1.3 support. Also like *The Muse*, they should really go to their settings and disable support for TLS 1.0 and 1.1.

**THE LINK (CONCORDIA)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Support for TLS 1.0 and 1.1 strikes again to create a weak link here in your connection with *The Link's* servers.

**THE VARSITY (UOFT)**

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Widely considered one of the best campus newspapers in Canada, *The Varsity* falls flat in their

HTTPS implementation, what with continued support for—you guessed it—TLS 1.0 and 1.1. They also show some blues with non-robust Perfect Forward Secrecy.

#### THE MCGILL DAILY (MCGILL)

(100% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) Okay, to be honest, I have no clue which of the *Daily* versus the *Tribune* is more representative of McGill students. I'm running out of puns here, so I'll keep this short: TLS 1.0 and 1.1. Non-robust Perfect Forward Secrecy. Y?

#### THE EYEOPENER (RYERSON)

(100% Certificate, 70% Protocol Support, 70% Key Exchange, 90% Cipher Strength) You may remember these guys for exposing the Ryerson Student Union spending scandal last year. Sadly, their security chops are nowhere near their investigative journalism chops, what with the mind-boggling, pupil-dilating list of warnings that SSL Labs spits out here. For starters, not only do they still support TLS 1.0 and 1.1, they still somehow support the RC4 cipher in connections with these outdated protocols. A lack of support for Perfect Forward Secrecy seals the deal here. Props to them, however, for enabling HSTS.

#### THE QUEEN'S JOURNAL (QUEENS)

(100% Certificate, 70% Protocol Support, 70% Key Exchange, 90% Cipher Strength) God save the readers of the *Queen's Journal*, for they must deal with both TLS 1.0 and 1.1 and no Perfect Forward Secrecy.

#### T: Y'ALL HAVE SOME TRUST ISSUES

#### THE CONCORDIAN (CONCORDIA)

(0% Certificate, 100% Protocol Support, 90% Key Exchange, 90% Cipher Strength) *The Link's* sibling appears to have a problem with trust, for the certificate it serves belongs not to it but rather its hosting provider. I shudder to think how inharmonious that business relationship must be for such a grave error to occur.

On the bright side, if they fixed that dang certificate they'd easily get an A+—there are no other weaknesses and HSTS is enabled.

#### THE EXCALIBUR (YORK)

(0% Certificate, 70% Protocol Support, 90% Key Exchange, 90% Cipher Strength) As they say, if you can hold a fork, you can go to York. This also seems to apply to the server administrators for *The Excalibur*, who appear to have neglected the expiration of their HTTPS certificate back in April. Coincidentally, this is around the same time when *The Excalibur* stopped publishing news articles online. Perhaps the broken HTTPS stopped their writers from being able to do their jobs? Or maybe the paper suddenly dissolved? Who knows; it's York.

#### THE MANITOBAN (UMANITOBA)

(0% Certificate, 70% Protocol Support, 70% Key Exchange, 90% Cipher Strength) A website that (1) supports TLS 1.0 and 1.1, (2) doesn't support Perfect Forward Secrecy, and (3) has an expired certificate. Well, at least I know where I'm *not* getting my security advice from in the future.

#### NO HTTPS: IT'S 2020, GET YOUR CRAP TOGETHER

#### IMPRINT (UWATERLOO)

'Nuff said.

—

Thanks for reading through this comprehensive ranking scheme of (most) campus newspapers in Canada! Obviously, **mathNEWS** wins with an A+. No, this most definitely was not rigged. No, I definitely did not set up the server to put us on top. No, I definitely did not write this to assert dominance over Imprint.

terrifi

1. <https://github.com/ssllabs/research/wiki/SSL-Server-Rating-Guide>

2. Short answer: We don't support TLS 1.3 because it's not worth the upgrade. Long answer: The **mathNEWS** servers currently run on the 1.1.0 branch of Open SSL, which is what is available upstream in our package manager; however, support for TLS 1.3 started with the 1.1.1 branch. If we wanted to upgrade, we'd have to compile and install Open SSL 1.1.1 ourselves, which then exposes us to the risk of missing out on security updates—a risk currently mitigated through automatic updates from our package manager.

## RE: MODERN PROBLEMS REQUIRE MODERN SOLUTIONS: LEARN AS A DATING SITE

I recently found out that a good friend of mine from the west coast has been using the direct messaging feature of UBC's Canvas system to converse and arrange dates with people from her classes. Although Canvas is not *exactly* Learn, I have been looking at their useful tutorials at <https://community.canvaslms.com/community/answers/guides/video-guide/pages/video-guide>. It looks and functions pretty much the same.

So there you have it.

# mathNEWS WEBSITE FINALLY UPGRADES TO HTTPS, TO WRITERS' PASSWORDS' GREAT RELIEF

**mathNEWS**, the normally fortnightly publication funded by and responsible to the undergraduate math students of the University of Waterloo, announced last weekend that it would be upgrading its content management system to HTTPS.

The Waterloo-based editorial office wrote in a statement to its writers, “We’re upgrading to HTTPS this weekend (July 4–5). The **mathNEWS** Wordpress may be intermittently unavailable during this time. Thank you for your patience.”

Formally specified by RFC 2818 in May 2000<sup>1</sup>, HTTPS is a networking protocol which protects against eavesdropping of information transferred between a client and website through encryption.

What asked what prompted **mathNEWS** to upgrade to HTTPS, **mathNEWS** editor emeritus terrified said:

*We discovered that UW-Imprint didn't have HTTPS so we saw this as an opportunity to one-up them.*

**mathNEWS** writers had the following responses when asked their thoughts on the change.

“Well, uh, that's all I have to say on the matter.”

JEFF

“Something's changed??”

A COOL PEN NAME

CC

1. <https://tools.ietf.org/html/rfc2818>

## MY 2020 ENDORSEMENT

As the presidential election draws nearer, we here at **mathNEWS** realize that many Americans out there are unsure of their choices and are looking for a reasoned, insightful voice to make sense of today's politics. That's why I am glad to announce I am endorsing Kanye West for President of the United States.

Unlike Donald Trump, Kanye West implicitly understands the limits on a President's reach and the norms that must be preserved to maintain American democracy. As West said, “no one man should have all that power,” clearly referring to the Constitution's Article II limitations on the power of the Presidency.

Of course, a President also brings his staff and advisors with him. Kanye has the right connections to build a competent, transformative executive branch.

Take, for example, a frequent West collaborator, Jay-Z. Hova has the economic talents necessary to restore America's place as the world's premier economy. As a New York City native, he has up close experience in the nation's financial capital.

But, he also understands that the government should not be run as a corporation, focused only on profit. Jay-Z's “not a businessman, [he]’s a business, man,” and America would be well served to let him “handle his business, damn.”

West's wife, Kim Kardashian, would be a First Lady with unprecedented global reach and reputation. In addition, her ability to “break the Internet” may prove useful in a world where threats to American national security are increasingly digital.

There are obstacles to a West Presidency, to be sure. The filing deadlines have passed in several pivotal states, like New York and Texas. But, a West presidency could be just what the country needs. America, I believe Kanye will “let you finish” the work of becoming the great democracy you deserve to be.

UW Unprint

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UW'S BASTION OF ERUDITE THOUGHT SINCE 1973

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# HARMONIC CONVERGENCE

What mathematicians think when they hear the phrase "Harmonic Convergence":

NO YOU IDIOT!!! The series

$$\sum_{n=1}^{\infty} \frac{1}{n}$$

DOES NOT CONVERGE!!!!

What I think of when I hear the phrase "Harmonic Convergence":



A Mathemagical Psychic And Astrologer

## RE: MILKING EVEN MORE CONTENT OUT OF A THIRST ARTICLE

Dear A cool pen name, thanks for the kind words—your idea of using Quest as a dating site was an idea that went Beyond Innovation, and I believe such Beyond Ideas deserve Beyond Disruptive exploration—X as a dating site articles haven't run dry yet!

With regards to your invitation to Olive Garden, I must decline, as I currently hold a peer mentor position for incoming first-years that would make such a relationship inappropriate. No hard feelings! :)

CC

P.S. Dear editors, thanks for not banning me (I hope) for using mathNEWS as a messaging service. [Editor's Note: No sweat.]

No disclaimer. I approve the message at right.

GOD ⚡ PEED

# IS THIS WHAT CARPAL TUNNEL FEELS LIKE? OH GOD

It hurts so much to even type this out. Is this really the end for me? Sitting in front of a computer all day really does me no good to be really fucking honest with you. My hand is in agony. A-G-O-N-Y! Eaaaaaarrggghhhh!

But I also can't *not* write for mathNEWS. I've got a 26-issue streak here and I'm NOT about to break it. Yes reader, I'd risk surgery to my median nerve for the sake of mathNEWS! Because I love it more than life! AGH! My wrist! Gaaaaaahh!

The good thing about mathNEWS is that a 100-word article is still an article. That's my cue!

Finchey

## PRODNIGHT HORROR HAIKUS

Writing article  
Click save draft by accident  
"Session expired"

Fell asleep in lab  
Woke up, hungry for pizza  
Everyone has left

Cat walked on keyboard  
Hit "Publish" on obscene rant  
ABORT ABORT ABORT

Arizona can  
Single dead wasp floats inside  
Earth-shattering scream

Updated WordPress  
"Internal server error"  
Forgot to backup

quantum goose

## FUCK PD

I have to do PD, but I'm submitting this article because terrified asked me to test the HTTPS.

Sandwich Expert



# THIS IS THE END

## gridCOMMENT 143.4

Of this week's issue, that is. Any other ends, of your journey, the world, or otherwise, are up to you. Speaking of ends, our resident **gridMASTER** has ended the making of **gridWORD** for this term, so it is my solemn task to dredge up a rerun.

This one is from all the way back in October 23<sup>rd</sup> 1998, aka v78i4, aka the oldest issue I could find on our website. A bygone era where volume numbers were only two digits long. I hope they still used the same English we do back then.

The **gridMASTER** behind this one is Richard "the Griddler" Bilson, which is probably my favorite writer name ever. Richard, if you're out there reading this, thank you for your service.

In the spirit of encouraging historical inquiry, no solution for this one. If you want to know, you'll have to pay a visit to [www.mathNEWS.uwaterloo.ca](http://www.mathNEWS.uwaterloo.ca). This issue's **gridQUESTION** is, in the spirit of The Griddler, "what is the objectively greatest breakfast food?" Shoot your answers to [mathnews@gmail.com](mailto:mathnews@gmail.com), and you'll be featured in the next **gridCOMMENT**.

Alternatively, if you think the original **gridMASTER** should be receiving these answers, according to the original **gridCOMMENT**, Richard can be reached at [rcbilson@undergrad.math.uwaterloo.ca](mailto:rcbilson@undergrad.math.uwaterloo.ca). I'm sure he'll be glad to hear your responses.

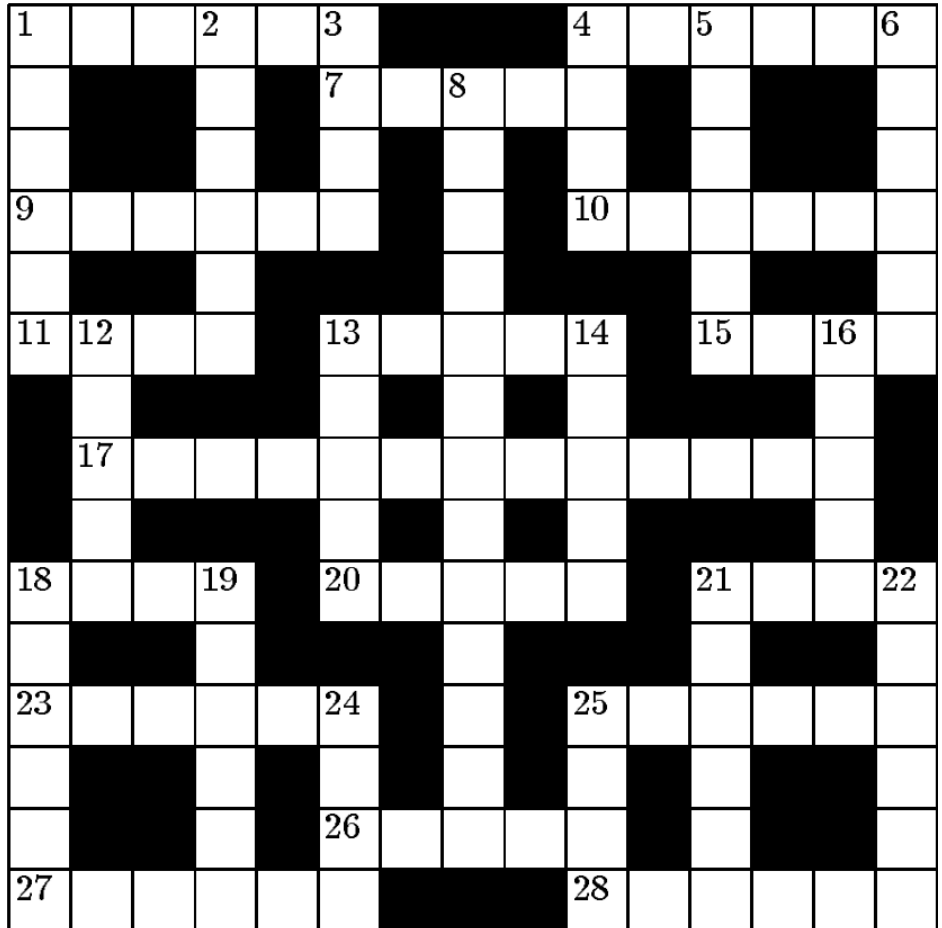
god ⚡ peED

### ACROSS

- 1. Never ceasing
- 4. Set of elements that map to zero
- 7. Winter hat
- 9. Automatic response
- 10. B-vitamin
- 11. Reflected sound waves
- 13. Italian money
- 15. Evil alter-ego
- 17. Star grouping
- 18. Father
- 20. To banish
- 21. To remove excess
- 23. Indivisible
- 25. British mathematician Arthur
- 26. First Indian Prime Minister
- 27. Tribute
- 28. Kate from Mathnet

### DOWN

- 1. To build up
- 2. Delphic deity
- 3. River of the dead
- 4. To adjust character spacing
- 5. Arabian capital
- 6. Relaxing room
- 8. 10-15, Canadian-style
- 12. Desert plants
- 13. To carve by rotation
- 14. Thin reptile
- 16. Australian dog
- 18. Complex carbohydrate
- 19. Town in Waterloo Region
- 21. Now Sri Lanka
- 22. Occasion of remuneration
- 24. Pine seed
- 25. Shark bait



Drop your gridCOMMENT answers off at ~~MC 3030~~ our email.

# lookAHEAD

SUN JULY 12

MON JULY 13

TUE JULY 14

WED JULY 15

THU JULY 16

FRI JULY 17

SAT JULY 18

WUSA July Council Meeting (10:30 AM - 2:30 PM)

51<sup>st</sup> anniversary of the first Moon landing

SUN JULY 19

MON JULY 20

TUE JULY 21

WED JULY 22

THU JULY 23

FRI JULY 24

SAT JULY 25

mathNEWS 143.5 production night

mathNEWS 143.5 laid out and edited, probably

mathNEWS 143.5 published

MathSoc S20 General Meeting (3:00 PM - 6:00 PM)



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

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

THE mathNEWS EDITOR WHO PUTS THE "NEWS" IN mathNEWS

