I WANT YOU TO READ

mathNEWS

XI 2018

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"HOW DO WE GET REVENGE ON CS 135 FOR STEALING OUR WRITERS?"

Monday, October 29th, 2018

I arrive. Flag hoisted.

The room is quiet.

One. Two. Three.

There are three people.

"Don't worry," I say,

"They'll come."

Waiting. Waiting. Waiting.

We decide to order pizza.

Crust. Sauces. Toppings.

They will be hungry.

Waiting. Waiting. Waiting.

The pizza is here.

Too many slices for too few mouths.

Too few articles for too many editors.

Waiting. Waiting. Waiting.

I rise.

I must go.

I know who is responsible.

Computer Science.

confusED
Editor, **mathNEWS**

SIGSEGV	Misatribute questionable **profQUOTES** to the instructors
ME	Make Ian Goldberg teach 135
PERMANENT PSEUDONYM	As Wednesday Addams would advise us: Murder.
Cyclons Did Nothing Wrong	Pull a fire alarm during the exam to get the students back.
FRUITBOY	Declare **mathNEWS** a religion so our writers are excused for religious practice from writing the exam
whyOS	Purposefully infiltrate the registrar's office. Over the course of several terms, secretly manipulate the CS midterm dates so they conflict with other non-trivial events such as Thanksgiving, Feridun's birthday, and communications courses with mandatory participation. Slowly move the midterms to be closer to each other, until there is barely anything that can be taught between them. Should any objections be raised, note that you are contractually obligated to find the best possible times for exam scheduling, and the dates you have chosen are examples of that. When the professors finally realize that there is not enough time to definitively test the content, there will be much wailing and gnashing of teeth — but it will be too late, for revenge is a dish best served as a design recipe.
Childish Gambino	For every student they steal, the instructors must write an article.
Third person I	Shame them by showing that even ECE105 had a shorter midterm
CC	Simply have the **mathNEWS** Department of Foreign Affairs threaten CS until they reschedule their midterms.
Xx_420SonicFan69_xX	With a swarm of questionable fanart.
confusED	One word: geese.
overengineerED	Forcing CS135 profs to write profThoughts for a whole term and have the students grade their profThoughts
staplED	Bribe them with pizza to schedule things "better" (or else!)

ARTICLE OF THE ISSUE

This week, article of the issue goes to Cix for the amazing comics and covers they've been giving us, including this issue's cover and comic, Bust. Come to MC 3030 to pick up your prize!

swindlED
Editor, **mathNEWS**

CS 135: Please don't do this to us anymore.

JAMIE ANDERSON, mathNEWS EDITOR FOR FALL 2018
ALONG WITH NOSHERWAN AHMED, ESTHER AHN, CLYDE BROWN, AND ANUJ OPAL

mathASKS 138.4
FEATURING SEAN SPEZIALE

OVER-ENGINEERED: DO YOU CHECK REDDIT OFTEN FOR STUFF RELATING TO YOU?

I went into a few chatrooms back in the late 90s, and to tell you the truth, I didn't get that into them. Wait, is reddit a chat room? Kinda, sorta?

But seriously, no would be the answer, except for this question which spurned me to check, and fortunately I didn't find anything about myself there. That's comforting to me. My (perhaps cynical) feeling was that it's probably a place that people go to complain and be negative. (What about the web would ever make one think such a thought?) But hopefully I'm wrong and it's mostly a positive reinforcing community. Someone tell me if it is, and I'll go check it out. In any case, I still think I'm glad I'm not trending there, that is, if things 'trend' on reddit.

0X539: HAVE YOU CALCULATED THE CURL OF YOUR HAIR?

Good question OX539. We can go a couple of ways with this.

It's possible that your premise is misguided, and that you have not fully understood Stokes' Theorem. See, we need to take the curl of a vector field and dot it with the normal vector to the surface. My hair is a surface in R3. It can be parameterized and the normal vector can be computed. So then the appropriate question would be: have you computed the normal vector of your hair? No, I have not.

Or, are you suggesting that my hair represents the field lines of a vector field? Hmm, interesting. I have also not done this computation, but I bet there's a sine or cosine involved.

Please clarify and we can continue this discussion during office hours.

WHYOS: WHAT'S YOUR MOST FAVOURITE MATH JOKE?

That one about the mathematician building a fence around himself and defining that to be the outside. Yeah. That one's pretty good.

Or the one about two people going into a house then three people coming out and the mathematician saying, "if one more person enters the house, it will be empty."

STAPLED: GOT ANY GOOD KNOCK-KNOCK JOKES TO SPARE?

Here's one I recently told my child. Knock knock. Who's there. Orange. Orange who? Knock knock. Who's there. Orange. Orange who? Knock knock. Who's there. Orange. Orange who?

Knock knock. Who's there. Banana. Banana who? Orange you glad I didn't say (pause.....thinks...) oops.

XX_420SONICFAN69_XX: WHAT IS THE FUNNIEST THING A COLLEAGUE OR STUDENT SAID TO YOU?

I would like to change "said" to "did". A couple of my former students, after I taught them STAT 230, made me this little glossy booklet with a shirt cutout on each page. I'm known to where polos quite often, and they had designed each page almost identically to many of my shirts. Like detailed to the point where there was this thin green stripe bordering a thicker blue stripe that was in the picture but which until then I hadn't even noticed on my own shirt! To top it off, on the back page was a frequency histogram (get it?). I don't think it was real, well I hope it wasn't real, but it was appropriately funny nonetheless. Unfortunately, those students never actually told me who they were! They just signed it as "from some of your devoted stat 230 students". Why?!

NARAYAN: HOW MANY TIMES HAVE PEOPLE PUNNED YOUR NAME WITH 'SPECIAL'?

Especially often.

CIX: WHAT ARE THE BEST RESTAURANTS IN THE KW REGION?

Wish I had a better answer for this. Since I don't live in KW I am unfortunately out of touch with the restaurant scene. When I was a student I used to love going to the Huether Hotel, or any of the establishments in that building. Patio in summer and brick basement with fireplace to keep toasty in the Winter. At least I remember there being a fireplace or maybe a wood fired pizza oven? See, it's been awhile. Funny story about that place, my friend used to work at the brewery, Lion. Their operation used to be...let's say, not a great operation... so they would just bottle whatever beer in whichever bottles they had labels for. So at least a couple of times I got a call to come stock up on the discount brand, since they had actually bottled their premium in those. Oh Lion.

PIZZA GUY: WHAT'S YOUR FAVOURITE TYPE OF PIZZA?

Well, there's a topic close to my heart. Probably some kind of cured meat, a nice cheese, and some spice. There's one at a place near my house with cacciatore sausage (which has a nice bite), regular cheese and sauce, and this really tasty hot pepper oil. Mmm. But - dehydration warning! Keep some lemon water close by.

In my later years I've also come to accept and appreciate non-traditional pizzas, for example: prosciutto, brie, arugula, balsamic drizzle and (maybe) caramelized onions. Yum.

There are certain veggies I don't really like, but other than that, if there's pizza, invite me. And please, thin crust and well done. Let's keep it classy.

GRADIENT DESCENT: WHAT DO YOU THINK OF THE WATERLOO SQUIRTER?

??

XAVIENTOIS: WHAT IS A ONE SENTENCE DESCRIPTION OF THE STEREOTYPICAL FIRST YEAR?

An enthusiastic individual who sometimes feels down due to the lack of exceeding expectations often for the first time in their lives, only to (hopefully) realize that things will be alright if they can find a solid work/life balance.

BEYOND META: WHAT'S SOME COOL MATH PEOPLE DON'T NECESSARILY KNOW ABOUT?

I'll take people to mean the average math student at UW, many of whom have not continued in AMATH/PMATH far enough to learn about functions of complex variables. In that case, some pretty cool stuff I'll teach to my electrical engineers this term is how we can use something called contour integration in the complex plane to evaluate integrals of real variables. For example, given the integral:

$$\int_{-\infty}^{\infty} \frac{1}{1+x^6}\, dx$$

We find the six poles (or six sixth roots of -1) in the complex plane, and after some magic, you get ⅔π. Complex analysis is so wonderful. And weird.

STUDENT: WHAT IS A QUESTION YOU ARE SICK OF BEING ASKED?

Do I need to know this?

OVER-ENGINEERED: HOW DO YOU MAINTAIN SUCH A BIG LUSCIOUS CURLS?

Avoid at all costs the following: 1) hair brush/comb. 2. hair straightener.

Production Nights are every other Monday. We meet at 6:30 in the MathSoc Office.

Please come...

A LONELY math**NEWS** EDITOR

SEARCH FOR A NEW STAR

Dear citizens of the Earth,

I think it's time we search for a new star.

I don't say this because the Sun will eventually burn out. We still have another 5 billion years for that to happen, and, as much as I care about my future generations, I think 5 billion years will suffice for my lifetime.

I say it because I think the Sun is a slacker.

We depend on the Sun for energy and warmth. In my opinion, it offers us a service. We pay a price for this service in many forms. The most common form of payment is tanning or sunburn. If you look at our arrangement with the Sun, the Sun is a vendor for the Earth. We have a working relation.

I don't know if you've noticed this, but every year come Fall, when most of us are back to the grind at work or school, the Sun seems to laze around. It shows up late and leaves early. Some days it feels like it's at its desk, but sleeping. On winter days, it's super cold and the sky and ground look like they're one white canvas. I'm sure you've experienced this. Try providing a service without punctuality and with varying quality, and I'd like to see how your business flourishes.

We even try to bend the rules to appease it and better suit its timing with Daylight Savings. Have you ever heard of a company changing its work hours for a vendor?

In fact, it stays this way for most part of the year, except during the 4 to 5 months that we call summer (where it rains, and the Sun doesn't show its face). During summer, the Sun does overtime. Now I can't complain because I understand this logic. Who better would understand it? Haven't we all crammed before an exam? Put concentrated work in a limited amount of time? But this sort of behaviour is unacceptable when you have a working relation.

And it's not just us that's having to put up with this. Ask Mars. The poor thing is cold. Sure you'd blame the atmosphere there. But, is our "one, true source of energy" really incapable of providing warmth to our neighbour?

We've stayed silent for long and put up with this rubbish. Now's the time to raise our voices. Let's show the Sun that we are no slaves, begging for its mercy. It's time to team up with our brothers and sisters (the other planets). Let's find another star and make the Sun our secondary source.

To that day!

Yours truly,

Pondersome

P.S: Daylight saving ends on November 4th

A DEFENSE OF MINECRAFT

Minecraft, a 3D sandbox game released in 2011 by Markus "Notch" Persson, began as a sort of millennial's LEGO - it was about building and creativity. However, as the game grew in popularity, it gained an enormous presence on YouTube in cringeworthy parodies, millions of "Let's Play"s, and worst of all,　became a favourite of twelve-year-olds. This newfound demographic resulted in the complete dismissal of Minecraft by many former players, and shameful admittance of being a player from others. The final nail in the coffin for Minecraft's ubiquity has been the memes. The Internet has ruthlessly made fun of Minecraft players, all through an unnecessarily sarcastic tone. It is time for such teasing to come to an end.

Minecraft has universal appeal. I cannot think of anyone who doesn't like building things or at least being creative in some way. While working adults may not have the same amount time as others, many find that playing Minecraft is an excellent way to relax. Though first- and third-person shooters (i.e., Fortnite) are immensely popular, Minecraft retains popularity among older children. Since it is simple to grasp and pick up, it is popular with younger children. Even teenagers, though they may receive teasing for it, enjoy the game. This appeal has kept Minecraft from disappearing completely, and shall hopefully reintroduce it to players again.

Minecraft is a game that is immensely flexible. It can be made to look however one wants through the use of resource packs - entire replacements for the defaults used by Minecraft. Additional flexibility is made possible by Minecraft's modular code structure - it is relatively simple to program modifications, or "mods", to the game, which changes how the game behaves. In this way, one can bend Minecraft in whichever way they desire. There is a mod for nearly everything, and I say that with something of a shudder. Minecraft is well-known, and so getting help doing something or inspiration for what to build is limitless. One can even play with or without the challenge of mortality and use godlike omnipotence to build endless structures. Such limitless customization allows Minecraft to be expressive and personal -- an art form even.

Of course, everything must be done in moderation. I'm not suggesting everyone return to the Minecraft obsession of 2012-2015, but it is definitely time for a little revival of the game among those who may have once held it dear. Just be sure to download the so-called "Java Edition" while you can - it lets you do everything that makes Minecraft great, like modding and using alternative resources. The now Microsoft-owned Minecraft has an optional story mode and one has to pay for "behavior packs" - basically just officially-sanctioned mods. The Java Edition retains the freedom Minecraft players are familiar with, though depending how long ago you played, you may find things to be rather different. Come home to the taste of survival and creativity. Come home to Minecraft.

permanent pseudonym

P.S. - how could I forget the music!? I once saw a tweet that said "Minecraft music feels like wanting to go home but knowing you can't." It's such a strange, wonderful, melancholic soundtrack that I have to turn it off. Otherwise I cry.

mathNEWS: BATTLE ROYALE

Recently, astute **mathNEWS** readers may have noticed that several PVP (Penman vs Penman) - posts have been popping up in **mathNEWS**, such as *PVP: LAYTH,* and *A Review of the* Sonic Adventure 2 *Review From Last Issue.* While some critics may claim that such articles are merely low-quality derivatives of already-written works, this **mathNEWS** writer is here to defend the sanctity of our right to write **mathNEWS**: BATTLE ROYALE.

In past months, the video game *Fortnite: Battle Royale* has swept the world by storm, and **mathNEWS**, though seemingly alien at times, was swept by this wave as well. There is a primal human instinct that yearns for brutal, unfettered publication combat, and that instinct seems to have been awakened in our **mathNEWS** writers this season. And what better battle-ground than the ever-shifting pages of **mathNEWS,** with its pseudonyms to take cover behind, fast building words, and all types of article-of-the-issue loot boxes?

Survival of the fittest is what the deadly grounds of **mathNEWS** are all about. It is here writers train to be the best form they can be. A mediocre article will be followed by a better one, and eventually, perhaps a good one. Others will look upon your articles with jealousy and attempt to strike you down. You will do the same to them. Defeat is not a setback, but a chance to improve.

Now I call upon you, **mathNEWS** writer. As one *Fortnite* strategy article put it, *there's a difference between surviving and winning.* When the end-of-night pizza storm closes upon us, do you want to be some bystander hiding in the bushes, hoping to scrape by in top N? No. You are here to claim the Victory Royale**:** Article of the Issue. Write to build, write to destroy, and none will dare stand in your way.

Where we dropping, **mathNEWS?**

CC

profQUOTES 138.4

BIOL 130: HEIDI ENGLEHARDT

❝ We call it cremation…well, I call it dead.

❝ You'll learn more in third year, if you're still with us — sorry, I meant still with me.

❝ His dad was a chemistry teacher, so his childhood was probably very unhappy.

CO 330: DAVID WAGNER

❝ I'm not going to draw curly brackets. In fact, I'm not going to even draw commas. I'm that relaxed, it's Friday afternoon.

❝ If you want to know more about [infinite distributions], go to graduate school.

CO 342: BRUCE RICHTER

❝ ["Peek a boo" written on white board]|
Looks like there's something behind this. Shall we find out?
[Prof slides the board over to reveal "I See you" written on the board behind it]

❝ Eventually we're gonna show that this is a subspace…well, let's just do it right now.

❝ For the next 10 minutes, I'm not going to prove anything. It'll be a preview, like at the movies.

CO 456: JOCHEN KOENNEMANN

❝ Student: Mmmm…No.
Prof: [Nods slowly] Hmm…very wise.

CO 485/685: DAVID JAO

❝ Does 1994 sound recent to you? It's recent to me.

❝ [Teaching a course about cryptography] What, do I look like a cryptographer?

CS 135: CHARLES CLARKE

❝ The title is "Types of Recursion", I don't like that. Let's call it "Recursion gone bad."

❝ Pure structural recursion is a social convention.

❝ World's first 2 digit phone number…I remember that, it was 1999.

❝ [Talking about phone books and how the students were in kindergarten then] You guys were in kindergarten…

well this is Waterloo, some of you were in highschool at kindergarten age.

❝ [Dot product comes up in slides] You learnt it in linear algebra right? But you have seen dot product in highschool or something? Well, if you were outside of Ontario, you definitely learned dot product.

❝ In Ontario highschools you did something that consumed those hours… Did dot product with flowers and talked about how they made you feel.

CS 135: ROBERT HACKMAN

❝ This is right after Alexander Graham Bell invented the telephone, so there's only like 9 people on [this list].

❝ I'll include Meredith, since it sounds like an old person name.

❝ Maybe Alexander Graham Bell had a telephone number, and gave one to Meredith cuz he had a crush on her.

❝ So that is the quickest way for me to do it, and also quickly embarrass eight people.

❝ [Introducing trees] We decided to steal that idea from Mother Nature, and royally fuck it up.

❝ Computer scientists don't go outside that much. That's the only explanation for how they managed to mess this up so badly.

❝ If you're an animal, you can be a vertebrate or an invertebrate, if you're a vertebrate you can be a mammal, if you're a mammal you can be a primate, if you're not a primate then I guess you're…[looks at slide]…a rat?

❝ Oh geez, this isn't counting the number of nodes, this is counting the number of keys appearing…[throws chalk at projector screen]

❝ Hopefully you're following this rambling.

❝ Whoever asked to quote me for **mathNEWS** last week, don't quote me on that.

❝ The columns are vertical and the rows are horizontical.

❝ The answer's C! OH WAIT I WASN'T SUPPOSED TO come on guys it's a clicker question, I don't care!

❝ I wasn't kidding, you should probably switch to C in the next 5 seconds if you haven't already.

❝ So to the 7 of you who thought I was fucking with you, I wasn't.

> I don't lie, I embellish.

> A dictionary is a list of the English…Words…Language! That's it.

> Chimps don't have to reckon with the concept of their own death.

> And to the right of the idiot is where the chicken comes in!

> Good luck on the exam, unless you're in my class. Then you'll pass the test beautifully.

> So we're adding a new node under bird, let's call it shitbird.

> It says rat is not endangered — it should be.

> So pushing these buttons doesn't turn the lights back on, and there's like a combinatorical explosion of options.

> Sometimes you want to go through a binary tree, and then you have to touch all the children.

> 'Pre-' means, before you do anything, look at yourself, and reflect.

CS 135: KEVIN LANCTOT

> We let you pass the midterm, you get all confident, and then—BAM! Recursion!

> We don't want this hashtag-true, hashtag-false stuff. This isn't Twitter.

> Do you have any questions before it's clicker time? No? Okay, you had your chance.

> [Turns on spotlight] Things are getting serious now.

> I used to call my sister a degenerate…Don't tell my mom I said that.

CS 135: ADRIAN REETZ

> What is the largest number of no number?

> No one wanted this question to be in there, but no one bothered to take it out.

CS 486/686: ALICE GAO

> This is the rare situation where we get to choose our parents, so lets take advantage of it.

> [Talking about optimal moves in a decision tree] If you're here, then it's better just to end it…That is not the message I want to convey.

GER 211: MICHAEL BOEHRINGER

> I'm trying to kill you passively, not actively.

MATH 135: JORN VAN DER POL

> So does anyone have any questions?…I'm getting paid for this, so if you have any questions now's the time.

> So why does this make sense? I could've just bullshit a proof here, but this one makes sense logically.

> We've looked at addition, multiplication, subtraction, so now we'll look at…Lunch, I guess.

MATH 145: DAVID JAO

> If one is less than zero, then zero is less than one. That makes no sense. Good enough for us.

> This is the part where if you weren't in this class you would say 'd is obviously 1'. Since you are in this class this is the part where you say 'ARGH! D IS OBVIOUSLY 1!'

> Once you understand how to math…

> A mathematician cares primarily about the abstract nonsense.

> There's a big difference between the worst correct proof and the best incorrect proof. One is correct, the other is not.

> I'm smarter than Coq and I can figure it out.

> You can use pretty much anything you want [on the midterm] besides cheating.

> There was a time when this was the cutting edge of algebra research, back in 1594.

> If you were to try that in a numerical problem, you would burn 5 hours of your life and find out that doesn't work. That's a valuable experience.

> What's that? Paper? 20th century stuff.

> Ugh! Counting. How do you do that?

> We're slowing down. It's getting easier. This class is getting soft.

> At all other schools you would learn tricks for counting stuff. At Waterloo you learn the systematic theory for counting stuff.

> If you want to make it non-nonsense, which I guess just means sense.

66 [While trying to construct a coordinate system with a tape measure and chalk] It takes time to do this, but mathematics is worth the time.

MATH 137: BARRY FERGUSON

66 If it helps your memory, just picture me jumping up and down, screaming.

MATH 145: STEPHEN NEW

66 [Snew points at Racket code on the blackboard] I don't even know this language. It's just ugly. There's no beauty in that.

66 36 is 34+4.

66 Here's an exercise for you...actually, let me make the exercise more difficult for you.

66 I think I'm doing my proof in reverse. It's confusing me.

66 I'm still confused.

66 How many ways can we choose k of n objects? Trick question — it's too vague.

66 [looking at a decreasing graph titled "Happiness"] I thought that was enrollment.

66 We use the power of wishful thinking.

66 If you switch into MATH 135, you must write this final statement.

MATH 147: DAVID MCKINNON

66 The magic of mathematics will tell me there's a solution; I'm just too stupid to find it.

66 We've got a typological mismatch here, for those of you computer scientists out there. That's a delta, and that's an N. I don't want a delta, I want an N!...I sound like a petulant child.

66 One delta to rule them all.

66 Some people say he looked at the heart of infinity, and it disturbed him so much he became depressed — that's crap.

66 [after talking about Barbie dolls] You don't want to reinforce in kids' minds that math is hard, because math will do that on its own.

66 [After insulting engineers] I'm being cruel. Some of my best friends are engineers.

66 A corollary is a theorem that's cool because it's so easy to prove from another theorem, so we call it a corollary.

66 It could be uncountable, it could be extremely uncountable...That's not a technical term.

66 Someone comes along with a bucket of open intervals and dumps it on your closed interval!

66 Not that I'm going to do it again, because you've seen that movie before.

PSCI 359: MARIAM MUFTI

66 I'm not sure that Trump even knows whether Kashmir is even a conflict zone between Pakistan and India.

66 If India were to invade Karachi, it'd be like someone invading Ottawa. Sure, it would suck if it were captured, but nobody would miss it.

PSYCH 101: STEPHANIE DENISON

66 I'm not a habitual heroin user.

QIC 710: JON YARD

66 [Looking at his notes] Well my print off cut it off.

STAT 231: MICHAEL WALLACE

66 I try to do it with a flourish, it makes me feel better about myself

66 If you don't love the central limit theorem, you definitely should.

66 Sorry for the late start, I had to run to my office. Because I'm a nerd that never goes outside, this almost killed me.

66 When I was reviewing these slides I noticed two things. One, they could be better.

66 I don't mention all the biases in that process, cause I just want the money.

66 The tests aren't fun - well I find them fun, but I'm weird.

66 I talk a lot. You may have noticed.

66 Heroin is definitely bad! Definitely don't do heroin!

66 I asked my students whether or not they like poutine. It's a very important question, it tells you a lot about someone.

66 If you're someone who's used to coding in good programming languages, you're going to have fun with R.

STAT 441: ALI GHODSI

66 Having an Iranian background, searching the word "nuclear" might trigger some alarms.

THE JOSEPHUS PROBLEM

This problem originates with Flavius Josephus, a Jewish historian in the 1st century. His tale states that he and 40 of his troops were trapped in a cavern by the Roman army, and decided to take their own lives rather than fight the Romans or surrender. Their decided method, instead of each man taking his own life, was to do the following:

Each person would stand in a circle. Starting with the top of the circle (say, person 1), this person would then execute the person to his left (person 2). Then the next person after him (person 3) would execute the person to HIS left (person 4), continuing this pattern until only one person remains. That final person would then have to take his own life.

Josephus decided that, although he was loyal to his men, he also couldn't conceive the idea of having to die in this cave. He had the clever plan of positioning himself in the right place that he would be the final remaining person in the circle, then surrendering himself to the Romans outside instead of killing himself. But that raises the question, how is he supposed to figure out which spot to sit at? Sure you can sit there and count it out for n=41 soldiers, but what about 65? 112? 427? How do you find the solution for n soldiers?

If you would like to try to find the answer to this puzzle yourself, pause your reading here and write it out. I recommend writing out some examples yourself, counting out which positions will win for n number of soldiers. Start small, find a pattern. If you inevitably give up or somehow find a solution you want to check, that's when you can keep reading.

Done? Give up? Alright, to solve this we'll start with checking a few simple examples. We'll denote the # of soldiers with n, and the winning position with w. When n=1, w=1 (duh). n=2, (1) kills (2) so w=1 again. n=3, (1) kills (2), then (3) kills (1). So w=3. n=4, (1) kills (2), (3) kills (4) and (1) kills (3). So w=1, once again. Weird. We'll continue this table out a few more rows:

n=5, w=3
n=6, w=5
n=7, w=7
n=8, w=1

Seeing a pattern, where w=1? If you continued the table further you'd see that the continuing n values where w=1 are: 16,32,64,128,etc…Being mathematicians, you should see these values are powers of 2. So, we know that for any 2^k (k is any natural number) will result in (1)'s victory. Why's that? Well, looking at the circle you can see that if n is a power of 2, then after one full cycle around the circle, every other solider is killed and it starts back with (1)'s turn. Since you divided the number of soldiers in the circle by 2, you have a 'new circle' where the number of soldiers is now 2 to the power of (k-1) instead. This repeats until you have 2^0, or one solider left. The final survivor.

This is a good thing to know, that once you have a circle of 2^k, the very first person to take their turn from that point will be the final survivor. Now you need to find the 'golden position' for any n. Well, with what we've found so far, we can get that answer. Since any circle of 2^k results in the winner being the first one, you just need to pick the position that results in a circle of a power of 2. So we'll re-write $n = r + 2^k$. This r is a value showing the number of extra soldiers past the 2^k. Now we re-create the first few results, only including this r as well.

n=5, w=3, r=1
n=6, w=5, r=2
n=7, w=7, r=3
n=8, w=1, r=0

So now we're seeing a whole new pattern here, so for any r value we're seeing that the w is 2r+1. Neat! So to conclude the puzzle, for n soldiers, the winning position can be found by rewriting $n = r + 2^k$, then calculating 2r+1. To answer the initial question, about 41 soldiers, we can say:

$$41 = 9 + 32 = 9 + 2^5$$

2(9)+1 = 18+1 = 19. You can check this answer for yourself, counting out each soldier until 19 is the only seat remaining. Now you can use this puzzle to show how clever you are, and screw with all your friends!

Fruitboy

IMPORTANT UPDATE ON SLC CONSTRUCTION

Shit's *still* broken.

Fruitboy

INDOOR TRANSPORTATION

Around UW, I'm sure many first-year students, like myself, have noticed the large amount of indoor pathways suspended above the concrete, which connect many of the buildings around campus. You may even have had the privilege to pass through a couple of them. Well, I decided the large, seemingly maze-like connection of bridges was going to remain a mystery no longer. The cold is sweeping upon us, and surely the geese will begin robbing us of our warm articles of clothing any day now. My solution, for everyone's sake, is to make an effort to advise people of the many methods of indoor transportation between campus buildings. For example, I've now found a route that I can take where, from the overpass across University Ave, I only have to take a max of about 120 steps outdoors to reach any of my classes. I've taken it upon myself to map out the (continuously increasing) number of indoor paths through campus, because I'm too cheap to buy a decent pair of gloves and I'm sure many of you are too.

(Note: For the study of this article, each of these inter-building paths has been traveled at least once, to ensure their validity and use.)

BUILDING CLARIFICATIONS

Through my time exploring the campus buildings, I've come to realize there are some instances where you can simply walk through a set of double doors, still in the same structure, but all of a sudden you're technically in a new building. If you can take down the walls between 2 buildings without exposing any rooms to the outdoors, I'm sorry but that's the same building. Come on. As such, I've defined a few 'general connections' as the following:

SCI – Contains STC, B1, B2

EV – Contains EV1, EV2, EV3

C23 – Contains E2, E3, CPH

E57 – Contains E5, E7

ETP – Contains EIT, PHY

One smaller point, I've also made one slight 'general DISconnection', which is architecturally defined as one building despite being 2 smaller buildings of the same style, connected by a bridge that passes over the road. I'm sure you know what I mean.

DC – Split into DCN (north building) and DCS (south building)

Note: The format of the connections are as follows:

(Floor1/Floor2 of Building) Building Abbreviation [Specific Abbreviation] – (Repeat) – (Possible Repeat)

Bridges: After some internal debate, I've decided that the 'formal definition' of a bridge should be any walkway that passes above a path or road, such that tearing down this connection would result in a hole roughly the size of a doorway, exposing each connected building to the outdoors. This seems obvious for most bridges, but this definition means that the 2nd and 3rd floor paths from B1 to ESC are also bridges despite featuring offices on each floor of these halls. Because many pass under it daily to reach the Rock Garden and MC, it falls under bridge (Fight me).

3rd MC – 2nd QNC

3rd MC – 2nd DCN [DC]

4th MC – 3rd DCN [DC] – 3rd M3

2nd DCN [DC] – 2nd DCS [DC]

3rd DCN [DC] – 3rd DCS [DC]

2nd QNC – 2nd SCI [B2]

3rd SCI [STC] – 3rd NH

2nd SCI [B1] – 2nd ESC[1]

3rd SCI [B1] – 3rd ESC[1]

3rd ESC – 3rd C2

3rd ESC – 3rd ETP [EIT]

2nd DCN [DC] – 3rd C2

3rd ETP [PHY] – 3rd C23 [E2]

3rd C23 [E2] – 3rd DWE

4th C23 [E3] – 3rd E57 [E5]

3rd E57 [E7] – 3rd E6

2nd SLC – 2nd PAC

3rd DWE – University Ave

Stairwells: This is a complicated sub-section of the 'bridges' definition. There are 2 noted cases where a staircase exists that connects 2 buildings, but isn't a fundamental part of either building (Mysteriously, tearing down these stairs would result in the same circumstances as bridges).

1st/2nd DCS [DC] – 2nd/3rd E23 [E3]

1st/2nd DWE - 3rd/4th CPH

Tunnels: Tunnels are connected between buildings similarly to how bridges are, except pass under the walkways/main floors of the buildings instead of over them. Destroying these tunnels wouldn't be very exciting, as they'd probably just cave in and result in some awkward divets in the dirt above.

1st SCH – LL TC – LL AL

LL AL – 1st EV [EV1] – 1st ML

1st EV [EV1] – 1st HH

1st MC – LL C2

1st DWE – 2nd RCH

2nd RCH – 1st E23 [E2]

1st ESC – 1st ETP [EIT]

Mapped: I coloured an entire campus map with each of these pathways, plus a few fun bonus lines. Also available on Reddit at:

https://www.reddit.com/r/uwaterloo/comments/9sl2hm/the_map_is_back/

(Thanks to everyone who responded with anything I missed!)

Fruitboy

1. Again, fight me.

MATHSOC SEZ

Hello hello hello!

MathSoc's got some exciting things going on in November!

- **Pi Day:** We'll be hosting our annual Pi Day on the 313th day of the year - Friday, November 9th (unfortunately, the 314th day of the year is on a Saturday this year). MathSoc, as well as some faculty members (including some professors) will be handing out free slices of pi on the 3rd floor of MC (in front of the CnD) starting at 1:59pm! There'll also be a Pi recitation contest in MC Comfy at 3:14pm, and the winner will receive an award of $100π!
- **Party with Profs:** Party with Profs is happening this term on November 13th at 4pm at the Bomber. Free food (and if you're of legal age, a free drink)! There'll be a couple of professors around, so grab a drink and have a nice, long conversation about how you should have received 90 on the midterm instead of 50 anything! Remember to bring your Watcard and ID.
- **Destress events:** There will be a variety of destress events happening on the 3rd floor of MC throughout the month; some events include free hot chocolate, or even therapy dogs! Be on the lookout on our Facebook page for more details.
- **T-Shirt Sale:** All MathSoc t-shirts are $10 (down from $15). While supplies last!
- **MathSoc General Meeting:** The termly general meeting will be taking place on **Tuesday, November 20th at 5pm** in MC Comfy. Agenda items can be submitted to mathsoc.uw@gmail.com and are due on **Monday, November 12th at 4:59pm ET**. All 5 MathSoc execs will be giving a quick overview on what they've been working on this term, and will be answering any questions that you may have. We'll also be looking for your opinion on how MathSoc is doing right now, and how it can improve to ensure that your time here as a math student is enjoyable! A representative from the Math Endowment Fund will also be there to go over what MEF has done this term.

I've also got some announcements from Feds and your Feds Math Councillors!

- **Suggestion/Feedback form:** Want to ask the Feds Math councillors a question? Have a concern about the university and/or Feds and want to bring it up? There's a form for that! If you'd like to contact the Feds Math Councillors, you can fill out this web form: http://bit.ly/MathCouncilFeedback. The form is completely anonymous.
- **By-Election:** There's also a by-election for the Math seat on Feds student council! There are two candidates running for the position:
  - John Hunte
  - Rongzhao Li

  Voting will take place on Tuesday, November 6th and Wednesday, November 7th - you can vote online at https://vote.feds.ca/login or at the polling station in the MC 3rd floor hallway between 9:30am and 2:30pm on both days! Results will be announced on November 8th. For more info about the election, head to http://bit.ly/FedsByElxn or email policy@feds.ca.

Questions? Comments? Concerns? Or just want to talk? Find us on Facebook (Mathematics Society), Twitter (@mathsoc), Instagram (@uwmathsoc), or by email (mathsoc.uw@gmail.com). We're also getting a new website soon (!!!!!) - stay tuned.

Have a great November, and stay warm!

Alex Lee
MathSoc Prez

THE PROBLEM WITH "I'M HERE TO TALK"...

*TRIGGER WARNING: DEPRESSION TALK AND SUIC*DE MENTION.*

[Editor's note: This article was originally published in mathNEWS 137.6. We've re-printed it in this issue after a reader pointed out that it might be an important read for many students this term as well]

Greetings **mathNEWS** readership! I am currently clinically depressed and having a rough time doing day-to-day tasks such as getting out of bed in the morning and trying to not fail any exams. Today is a slightly better day (hence why I am able to combine ASCII characters for **mathNEWS**), and I'd like to give a couple of quick tips to those who may notice their friends acting a bit funky. If I had good advice on what to do if you, yourself, are depressed (aside from not cancelling therapy appointments, taking your meds, generally trying to do things, doing things, eating fruits, waiting out the storm, and sleeping enough), I would be taking them and not in this position.

I do however have a lot to say about how I need to be treated when I am in a depressive episode. I'd like to share a bit of my advice to potentially help out someone else going through a similar situation. I'll be talking about what you can do to support a friend that you suspect might be having mental health troubles.

Below are a few signs that your friend might be depressed:

- They stop going to class..
- They stop leaving their room.
- They're usually a speedy texter but now take hours to reply to you.
- Their sleep schedule is out of whack.
- They have lost interest in their hobbies and are bailing on events that they used to be super excited for.
- They look like they have the flu but don't have a runny nose or a sore throat.
- When you go out they drink or smoke too much.
- They seem to be on edge and may give you short and sarcastic replies when you speak in person.
- You never see them eat or drink anymore.
- They are wearing the same clothes everyday and do not seem to be showering.
- They are crying…like a lot.

Now, of course each of these can be attributed to things other than depression but given our demographic (university students in Canada) there is probably some sort of mental health issue at play.

Here are some things not to do and why:

- Ignore that they are acting weird. This may seem like the best thing to do because getting acknowledging negative changes in someone's demeanour can be super awkward. As a child of Rwandan immigrants, I am familiar with belonging to a culture that stigmatizes mental health troubles.

However, ignoring an issue will rarely make it go away. Signs of depression are not as easy to spot as the signs of going into anaphylactic shock, but both can be life-altering and deadly. If you notice that your friend might be depressed, it is your responsibility as a friend to attempt to help them since no one else might notice.

- Think to yourself, "a while ago I told them that I'm here if they ever need to talk" and assume that things must not be that bad since they're not reaching out. Unfortunately, one the pesky things about depression (at least in my experience) is that it will act like a parasite and do everything in it's power to make you a host organism that will nourish it and let it grow as it feeds off of you until there is nothing left. On a healthy day, it takes a lot of emotional energy to talk to friends about mental health. On depressed days, this feat is one comparable to getting an A+ on a MATH135 exam (not impossible, but quite difficult).
- Shame them for being lazy. If someone is already feeling really crappy, agreeing with the sad little voice in their head will not suddenly give them the energy required to escape the slimy demon of sadness.

Below are few things that you can do to help a friend that you suspect is depressed:

- Privately ask them how they have been doing lately. Hang out with them one-on-one and check in on all their spheres, notably their academic spheres, their romantic spheres (if applicable), their employment spheres, their family spheres, and their mental/emotional spheres. If they have just been busy and not in a deep sadness you should be able to deduce that after talking to them either on the phone or IRL. The key in this step is to be one-on-one (or with a group of close friends) and work your way up to the big depression question. If you ask them out of the blue, they might be caught of guard/offended and give a misleading reply.
- Firmly offer to do housework with them such as cooking or cleaning. Ask them if you can come over at a specific time and date and be prepared to help them do a chore or let them take pictures of your notes from that class that they've missed.
- Buy them one of their favourite drinks and deliver it to them to let them know that you love them and care about them. Ask them what they've done today and what they plan to do tomorrow.
- Walk with them to Health Services or Needles Hall to book a counseling appointment. Alternatively give them the phone numbers of these service providers and ask them to text you after they have booked an appointment.

If while on your quest to support your sad friend, you realize that things are escalating and you are in an uncomfortable situation, remember that you must always put on your own oxygen mask before helping someone else with there's. If you are being triggered by being around this person, you can always contact campus mental health support and give them your friend's information. They will follow up with your friend to make sure that they're getting better and you won't have to compromise your own mental health. Also, if you suspect that your friend is suicidal, this issue is officially too big to deal with on your own. If your friend is at this point, there is very little that you can do to talk them off of the ledge. The best course of action is to call 911 to bring them to the mental health ward of the hospital where they will be forced to speak to a psychiatrist before leaving. This might seem scary but it is the best course of action, as the hospital has the resources to monitor them and keep your friend from hurting themselves or anyone else.

Most importantly, the best thing to do if you notice that one of your friends might be suffering is to talk to them about it. It is not your responsibility as a friend to cure someone, or to compromise your own mental health, but it is your responsibility as a friend to attempt to help them in the ways that you can. A phone call out of the blue to check up on them, inviting yourself over to their house to do laundry together, or being a bit pushy and getting them to study with you or join you on your trip to the gym just might be the push that they need to speed up their recovery.

I've obviously left a lot of things out and I'd like to expand on this topic further, but as someone who really could have used some help last week, I thought it was important to write this article. If you notice that something is off with your friend, do not be passive about it. Be active and make the effort to genuinely check up on them instead of ignoring their odd behaviour or wasting time worrying about if it would be too rude to say something to them.

Melancholy Morty

N WAYS TO GET FREE MARKS FROM PROFESSORS AFTER BOMBING YOUR MIDTERMS

- Stalk your professor on campus until they get tired of being followed around.
- Go to their office hours and cry in front of them (bonus points for crying hysterically and making a huge public scene).
- Threaten them with gulag and Comrade Stalin's wrath.
- Start a (*communist?*) revolution against the prof.
- Get your lawyer to "persuade" them.
- Bribe them.
- Challenge them to a duel at high noon.
- Have Feridun to intervene.
- <add obligatory Mr. Goose joke>
- Accuse your professor of writing for Imprint.
- Get a forged doctor's note and plead insanity during the exam.
- Hold the professor's family hostage.
- Hack the servers.
- Claim that marmoset wrote your exam (applies to non-CS versions of marmoset only).
- Force them to do prof**THOUGHTS**.
- Use their prof**QUOTES** against them.
- Have them shift all the weight to the final.
- Ask them to apply their favourite bell curve on your exam only.
- Erase a question that you did horribly on.
- Burn your exam before it goes into crowdmark (again bonus points of making a huge event out of it like the E7 grand opening).
- Burn down all the exams so everyone gets a 100 on that midterm.
- Burn down the university altogether so that we all can get our degrees in peace (Environment faculty might have some words to say to me after for suggesting this).
- Impeach the professor.
- "Democratically" elect a new prof that gives free marks.
- Provide sexual favours in return for marks.
- Accuse them to be in violation of Policy 69.
- Complain to your friends (if you have any).
- Whine about it on Reddit just like ECE 1A students (or any engineering program. They all are pretty whiny).
- Expose your professor's username on Reddit.
- Make fun of your prof on Reddit (**CAUTION: MAY RESULT IN HARDER FINAL**).
- Make a meme about getting free marks and sending it to your professor.
- Beat them in a game of Fortnite.
- Show them you know how to floss.
- Don't take care of yourself for a month and then ask for a smell test. (If they faint, go change your marks on their computer).
- Drop out of the course.
- Drop out of the university.

If nothing works, ask them politely. I am sure they will understand.

over-engineerED

PETITION TO RENAME UPPERCASE SIGMA TO BIGMA

Let's face it: mathematicians suck at naming things. How are you supposed to explain to math muggles the difference between a set, a group, a ring, and a category? Or that imaginary numbers are useful and totally extant mathematical objects with many applications? What the hell does it mean for something to be *normal*?

I propose a widespread update to mathematical terminology that will clarify and educate people on the value of mathematics. Noah Webster managed to change the spelling of jail from "gaol" to "jail," so why not get the ball rolling for math?

Rename uppercase sigma (Σ) to "bigma."

Replace the use of QED or that stupid end-of-proof symbol with "That's right, bitch!" **[Editor's note: don't be such a ☐]**

Rename imaginary numbers to "vertical numbers." The imaginary axis is normal to the real number line, after all.

As a corollary, rename complex numbers to "two-dimensional numbers." Quaternions will be "four-dimensional numbers."

Rename all mathematical terms that use the word "normal" to something more apt and less likely to be interpreted as a different "normal" or to simply mean "ordinary." We're not normal.

Ban the use of π as a variable or function name so it only refers to the sacred circle constant. Mathkind should take this opportunity to find a sexier name for prime counting.

Conform to the ISO 80000-2 standard on representing mathematical symbols by writing the constant e normally, not italicized.

That's right, bitch!

Loquatius

N INTERESTING THINGS MEF HAS FUNDED

Ever wonder where your hard-earned (or perhaps not too hard-earned) student fee dollars are going?

- **$1,100 - RAM Purchase, Bionformatics Club.** They must be building one heck of a *GAMING PC*!
- **$6,631 - The great polytope barn-raising project of 2018, Benoit Charbonneau:** All I can say is that I don't see any barns on campus.
- **$30 - Custom PCB, UW Nano Robotics Group:** It makes me wonder if it's actually even worth it to put in an application for thirty bucks.
- **$81.36 - Catering, C3 Inspire:** This was either one expensive lunch or a whole lot of inexpensive snacks.
- **$520 - Camera + Mouse**, **UW Nano Robotics Group:** How was the cost divided here? $500 *GAMING MOUSE* and $20 camera, maybe?
- **$230 - Lab & Lounge, Software Engineering:** As someone who's been in both those rooms, this sounds about right.
- **$10,000 - SE Lab Chairs, Software Engineering**: Perfectly balanced, as all things should be.

- **~$2,500 / Year - General Orientation Costs, AFM Orientation**: All right, who's the mole from AFM?
- **$1,424 - Textbook + Laptop, FARMSA:** Even if that's a $400 textbook, it's still a grand of *GAMING LAPTOP*!
- **$10,000 - Loop Table, Dean of Math:** Turns out this didn't even cover one third of the cost. Tragically, it's also currently broken.
- **$2,006 - Space Simulator, Waterloo Space Society:** Can't do *GAMING* without *GAMES*, right? This probably covered *Stellaris* and a good half of its expansion packs.
- **$15,072 - Web Servers, Computer Science Club:** Topping off the list of computers (which technically can be gamed on) are the infamous *GAMING SERVERS* of the CSC!
- **$13,043 - Robotic Test Mannequin, Watonomous:** When we die at the hands of a Watonomous Death Robot, take pride in the fact that we funded it.

CC

THOUGHTS ON THE CS 135 MIDTERM

QUESTION 1

what the fuck is a zaphod and why is it on my exam

QUESTION 2

fuck steppers fuck fuck fuck fuck fuck fuck fuckkk (looks at 2e) FUCK.

QUESTION 3

fuckity fuck fuck fucking fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck recursion fuck

QUESTION 4

this shouldn't be too hard, I've done this in JavaScript before... fuck.

QUESTION 5

fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck fuck shit

QUESTION 6

(a-b) wow this is easier than I expected

(c) FUCK fuck WHAT THE FUCK IS THIS FUCKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK KKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKKK KKKKKKKKKKKKK

fuckedUp

JOSEPHUS PROBLEM CHEAT

HOLD UP! If you haven't read my 'Josephus Problem' article earlier in this issue, don't you dare read this! This is closely related to that article and likely won't make any sense without reading it first. This is mostly just a way you can quickly find the solution to large numbers of n soldiers, without writing out the entirety of my previously mentioned solution.

There's a sneaky way to find which seat is going to win. The problem with me slipping this article in is that there's going to be a lack of solid 'proof' behind it. If I were to delve into a mathematical proof I'd have to do more work than I feel like doing right now, so I'll instead leave this as an exercise for the reader.

The trick here is to find the entire number of n soldiers in binary, whereas the previous solution only required the highest binary number. To show this example I'll use the n=41 traditionally told within the story. $41 = 2^5 + 2^3 + 2^0$. This can be written as 101001. Now, the trick: simply take the digit on the left end of the binary number and move it to the right end. So we convert 101001 into 10011 (omitting the first 0 for simplicity). Now just calculate 10011. $10011 = 2^4 + 2^1 + 2^0$, and would you look at that! $= 2^4 + 2^1 + 2^0 = 19$, which is the answer we found before using the other proof. Wild! As mentioned before, there's math at play here that I don't feel like talking about right now, so you can solve it yourself to procrastinate studying for those midterms.

Fruitboy

SNEW: THE MAN, THE MYTH, THE LEGEND

Stephen New has been a fixture at Waterloo for as long as anyone can remember. While known for his recreational problem solving sessions, Math 145 teaching and his beard, not much is known about his past. In fact, as it seems, no one remembers how he arrived to Waterloo or questions the fact that no one in living memory knows about his past. While it is highly unlikely that everyone that remembers him has suffered a fatal accident, this fact should be noted. However, **mathNEWS** has finally broken past the fog of information blackout and now reveal hidden facts like what his PhD thesis is on, when he graduated or even where did he graduate from. He graduated from McGill university in the class of 1997 and did his thesis on Deformations of Bundles over the Riemann Sphere. His advisor was Jacques Hartbees. These are enough facts for us to dig into the rest of his history and explore who he was. Unfortunately, his thesis looks more confusing than University of Toronto's Admission Criteria so we cannot tell

you what it is about. However, if you would like to have your brain dribble out, links will be provided. The next step to unravel the history is obviously breaking into McGill to look at their records. Unfortunately, there was not enough time to go there and still be on time for midterms. Therefore, the next step is left as an exercise to the reader.

https://genealogy.math.ndsu.nodak.edu/
id.php?id=67898

https://bit.ly/2zdrSsd

https://bit.ly/2Q5Hmpo

Detective Oblivious

A CORRECTION TO "WHAT IF EVERYONE PISSED AT THE SAME TIME AND PLACE?"

It has recently come to my attention that the ending scenario of my "What If?" knockoff unfortunately violates the laws of physics. In particular, it is impossible to have 158,529,411.8 litres per second of piss flow at speeds given by standard gravitational acceleration in a cylinder of radius 1 metre. Fortunately, modifying the scenario to obey the lays of physics is a simple matter of engineering.

We introduce the Piss Pressurizer 9000, a device whose sole purpose apart from further bankrupting our investors is to take a stream of piss and make it faster. Our little invention speeds up the piss stream to 50,461 metres per second, which is around 0.00016c. Although this is thankfully not fast enough for relativistic effects to occur (or sadly not fast

enough, should you choose to be like that), it is fast enough to ensure that the desired flow rate of 27 Niagara Falls is achieved. It is also fast enough to result in an output pressure of 1.27 Terapascals, which is 2000 times more powerful than the most powerful commercially available water jet cutter today. Combined with our giant nozzle, we've more or less created a urethra of death aimed straight at the heart of Canada's cutest province.

The results are left as an exercise to the reader.

whatifOS

THE CS 135 MIDTERM

(note: this article is satire, please don't actually take tests like this [but like if you do you're an absolute ledge])

"Stepper is easy, right? Just look for the stepper. Stepper… stepper…aha! Now time to get an easy 10 marks :)"

25 minutes later

"⅙ of the exam done, easy 10 marks :) :) :)"

These, and many other blunders throughout the exam, are why this was not necessarily the hardest midterm I've written, but the most infuriating. Many thoughts crossed my mind throughout the midterm like "why do my pencils keep falling?" "ok, so basically, im rackt," "bracket bracket bracket… bracket bracket bracket…" and, "I know we're allowed to do this, but are we allowed to do this?" I have a few strategies for students who wish to tackle the CS 135 midterm (the second one) and others with utter confidence and the utmost strategy. First, we will examine study strategy, then test taking strategy, and finally how to not stress out or vomit from stress.

Study strategy is an important part of all forms of test taking. If one has good study habits and studies efficiently and thoroughly, then they'll surely be able to do well during the exam as the person will have a comprehensive knowledge of the content. I employ a few particular strategies when studying. The first is to leave all studying until the weekend before. This might sound counterintuitive; wouldn't one want to study well in advance? While this is true, your poor time management means that you'll have to tackle assignments and midterms simply in order of which is most time pressing, as you'll have at most 48 hours to work on it. This is why it's most effective to leave all studying to a single day or two. Plus, having all the content in your head within a short time frame means you can simply empty your mind of that course after the assessment and are able to focus on another task more effectively before you have to revisit the course to relearn all the content!

Test taking strategy is quintessential to your success as a CS 135 student. So what you want to start off with is brainstorm possible ways to tackle the problem…and wait no that's not right, time to erase…ok now here's how we fi-- oh no, what if the function doesn't work here…wait we need more requires clauses in the contract…maybe I'll just erase the whole…no I couldn't do that there isn't any time, but it's all incorrect! *erases and scribbles something entirely different down* and that's how you tackle your questions: creating a grey blob of bracket-like pencil markings that you tried in earnest to erase without ripping the paper. For tackling every problem, you'll want to ask yourself: "did we do this before?" If the answer is yes, just do the same thing (or a similar thing) that was done in class. If not, then you're screwed. Template strategy boils down to: "how many ellipses do I need?" The answer is that your entire function should be in the form of hockey multiples: sets of 3 periods.

How to de-stress before an exam makes sure that your mind is clear from petty trifles like "grades" and "CS knowledge" and "crying myself to sleep the same night" and instead allows you to focus your energy on the task at hand: the exam. Ways to stay mindful include, for instance, getting less hours of sleep, so you're sleep drunk and thus more creative and less worried. You can also try taking a nap; just don't sleep through all of your exam (the first 30 minutes are technically legal)! Do legal drugs off of Waterloo campus (if you're of age) to boost creativity as well. To prevent vomiting, try your best not to gag on your tongue. Trust me, I've done it before, sometimes consecutively, and it's not fun. Slowly move your tongue forward instead, until it hangs out of your mouth like a lame giraffe. This way you can't possibly gag on it. Make sure to eat your least favorite foods, so that you can focus both on how the world is cruel and focus on the exam.

I hope you take these tips to heart, and may the odds be ever in your favour on the next exam! And if not, just remember that professors and TAs can't answer most questions you ask during an exam, including these so far (I've tried them):

"What's your favourite turtle?"

"If you could be a plant, what plant would you be, and why?"

"What's your least favorite Pokemon?" (this was after the exam; they answered Pikachu)

Xx_420SonicFan69_xX

GRIDWORD

FRASER SIMPSON IS THE HERO WE NEED RIGHT NOW!
gridCOMMENT *138.4*

There were a whopping *eight* submissions this week! I think that's a record for my tenure as gridmaster. I *would* take it as a compliment, except that five of the eight gridquestion responses were some variation of "bring back the old gridword author" or "make the gridword better". 😉

Oddly, all five of those submissions had post-it notes from the Engineering Undergraduate Office stapled to them, and all five of them had the exact same error ("GYRE/AFAR", not "GYPE/AFAP"), so sadly there are no winners from the EUO peanut gallery. That being said, you all seem to be fans of previous gridmaster Fraser Simpson. I don't know when he was gridmaster, but if one of you would be kind enough to tell me, we can try to help you out. I'll look up his puzzles, most likely be in awe of their greatness, and see if it's possible to distill any of his magic into a new grid for next time. At the very least we can re-run an old puzzle for you. Send an email attention to yclepED at mathnews@gmail.com and let me know which terms to check for.

Of the other three submissions, two were correct. Honourable mention goes to Sarah G. who answered "Wholesome things in Waterloo ♥". And this week's winner of a $5 gift card from the Math C&D is Ethan Zhang, who writes "A good **mathNEWS** feature would be lists of the most **Worth It™** restaurants in Waterloo by type (e.g.: Chinese, burgers, shawarma) for all of us broke ass uni students. I will write this *iff* I receive free samples from these restaurants for 'research' *nudge nudge wink wink* Ethan, we might not be able to buy you dozens of free meals at restaurants all over town, but we *can* offer you free pizza if you come to production night. Come by the office at MC3030 to pick up your prize and discuss your journalistic future.

This week's **gridQUESTION**: Write a great alternative clue for the answer to 7-Down in this week's grid. Drop off your solutions and **gridQUESTION** answers in the **BLACK BOX** next to the C&D on MC 3rd floor. If your puzzle is correct and you write the best answer to the **gridQUESTION**, you can win a $5 gift certificate to the world-famous Math C&D. Deadline is Monday, November 12 th at 6pm. Happy puzzling!

yclepED

ACROSS

1. Missing from the Marines, say
5. Dismay
10. Department store department
14. Jaywalking, e.g.
15. One of the 5 W's of journalism
16. Came down
17. Contemporary French cooking
20. The Pittsburgh of Germany
21. "Star Trek" rank: Abbr.
22. Baio or Bakula
23. Kiss
25. Three-toed ones
26. What you may enter after school
31. Lack of vigor
32. Big name in chips
33. Death on the Nile cause, perhaps
36. ___ mortals
37. Cast a wide net
39. A South American monkey; or with "caca", a South American lake
40. Barley bristle
41. Thailand, in Risk
42. Discordant
44. Carving made with light?
46. Filter
49. Gumbo vegetable
50. A-list
51. Publicity, slangily
53. Spinachlike plant
57. The not a, for example
60. WTO forerunner
61. Crews of "99"
62. Blacken
63. Old European language
64. Walloped, old-style
65. Ballyhoo

DOWN

1. "Green Gables" girl
2. Coaxes
3. Duty or burden
4. "I sure would _____ coffee with this pie" (2 words)
5. Carpentry tool
6. Chest congestor
7. Hammer part (This clue could have been much more juvenile!)
8. Parentheses, e.g.
9. 100 bani
10. Warrior for one
11. "Murder in the Cathedral" author
12. 0.11111.....
13. Cancels an edit
18. Boredom
19. British ___
24. Address
25. Songbird
26. Dalai ___
27. Again
28. European capital
29. "Remember the ___!"
30. Cold and wet
33. Hokkaido native
34. Antares, for one
35. Bundle
38. Backstabber
39. Russian comrade
41. Charlie or Martin
43. Divination deck
44. Diminutive
45. Racing vehicle
46. Swampland plant
47. Cloudless
48. Breaks in relations
51. Any thing
52. "I, Claudius" role
54. Hurting
55. Applaud
56. "Catch!"
58. "___ alive!"
59. "The Catcher in the ___"

YOU DON'T KNOW MATH: FOOD EDITION

haltingPROBLEM *138.4*

Hey! Loquatius here. Oh, and don't mind the smell. I'm training my fart-recognizing AI, DeepFart.

Welcome to the food episode! It's time to go on a gastronomic adventure at the corner of University and Philip. You are what you eat, so stop being International News and start being the plaza! There's everything you want from all around. Experience the wide range of cuisines available, such as Chinese, Chinese, shawarma, uh…either way, it tastes good, you know.

Just like last time, write down your guesses for next week's answers. Think you know your food? Use a spoon, fork, knife or even chopsticks, so come on and get down with the mix

Loquatius.

MAKES MY MOUTH WATER WATER WATER

DIS or DAT
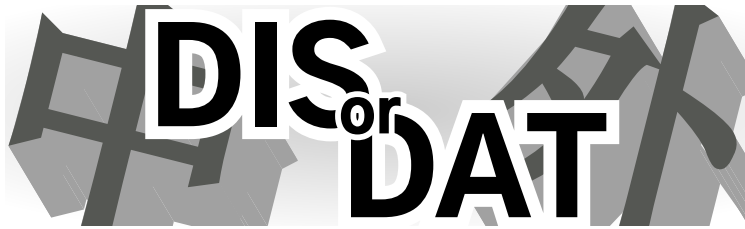
Below is a list of things you might see in one of the many Chinese restaurants in the University Shops Plaza. For each, you need to guess where they were first invented, discovered, or developed. Is it:

A. From China (more specifically, a place that's part of the present-day People's Republic of China and Republic of China), or

B. From elsewhere (in other words, ¬A)?

		CHINA	NOT CHINA
1	Chopsticks		
2	Teapots		
3	Fortune cookies		
4	The utensil you typically ask for if you're too dumb to use chopsticks		
5	The material that the menu contents are printed on		
6	The menu itself		
7	The mathematical principle you would cite if two customers have to share a seat because there aren't enough chairs for everyone		

WEIRD TRIP TO THE LOO LOO LOO

IT'S THE PUT THE CHOICES INTO ORDER THEN BUZZ IN AND SEE IF YOU ARE RIGHT

QUESTION

I'm craving pizza, but I want something that I don't normally get. Something…unusual. I think I'm gonna go **pick up** a **medium** pizza. Hold the **sauce**, hold the **cheese**. Beef on the **left side only**. But which pizza place should I go to?

Rank these pizza places by how much it costs **after taxes** to buy my **none pizza with left beef** by **pickup**, from cheapest to most expensive.

1. Pizza Nova
2. Gino's Pizza
3. Domino's
4. Papa John's Pizza

Cheapest ____ ____ ____ ____ Uncheapest

LAST WEEK'S gridSOLUTION

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

lookAHEAD

SUN NOV 4	MON NOV 5	TUE NOV 6	WED NOV 7	THU NOV 8	FRI NOV 9	SAT NOV 10
	WaterlooWorks rankings close at 10 AM. WaterlooWorks matches available at end of day.		Co-op continuous postings begin.		Pi day, Pie give away at 1:59 PM, Pi recitation competition at 3:14 PM.	

SUN NOV 11	MON NOV 12	TUE NOV 13	WED NOV 14	THU NOV 15	FRI NOV 16	SAT NOV 17
	mathNEWS 138.5 production night.	Party with Profs at the Bomber from 4-7 PM. First day of continuous round co-op interviews.		Winter 2019 schedule viewable on Quest.	mathNEWS 138.5 published.	

LAST WEEK'S haltingSOLUTIONS
YOU DON'T KNOW MATH PART 2

PERSONAL APPEAL

100 years. Wikipedia estimates[1] that all of its English articles would fit in about 2700 Britannica volumes. That will be the number of mathNEWS articles you must collect. With three terms per year and (assumed) six issues per term, mathNEWS makes 18 issues annually. mathNEWS started in 1973[2], so there would be 824 issues up to the previous issue, the 14th in 2018.

Let i represent the number of issues you still need to collect. Let t represent the number of years required to collect them.

i = 2700 issues target - [(2017 - 1973 + 1) prev. years × 18 issues/year + 14 issues so far this year]

= 1876 issues

t = i/(18 issues/year)

= 1876 issues × 1 year / 18 issues (Unit cancellation!)

= 1876/18 years

≈ 100 years

1. https://en.m.wikipedia.org/wiki/ Wikipedia:Size_in_volumes

2. http://mathnews.uwaterloo.ca/wp-content/ uploads/2014/08/v121i5pecial.pdf

CHECK IT!

ADBC

1. **Number of separate third floors in DWE**: 2. DWE's third floors are not contiguous. If you're on one of the third floors, you can't directly walk to the other third floor.

2. **Number of food/drink vending machines in MC from floors 1 to 6**: 12. There are 4 on the second floor and 8 on the third floor. No other floors have vending machines.

3. **Number of elevators and ladies' washrooms in PAS**: 14. There are 2 elevators in PAS, and 12 ladies' washrooms — 3 per floor.

4. **Number of health inspection infractions that Mr Panino received on July 3, 2018**: 8. The health inspector that day found 3 critical infractions and 5 non-critical ones. Amusingly, one was for not displaying a "Check it! We inspect it" public health sign to encourage patrons to look at public health records.