

math NEWS

Volume 132, Issue 4
Friday, November 4th, 2016



**Mathies: Deflecting holiday cheer
(or any kind of cheer) since 1967**

lookAHEAD**mathNEWS**

Nov 4	Issue 4 is thrown away with the Halloween decorations
Nov 14	<i>mathNEWS</i> writers gather to sing Christmas songs to each other non-stop until December 25 th
Nov 18	Issue 5 is put out for display with winter holiday ornaments

MathSoc

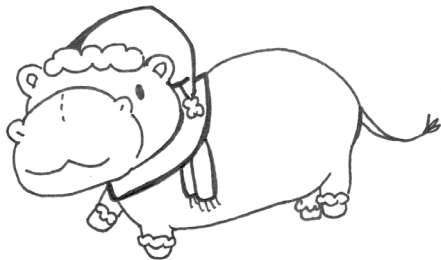
Nov 7–11	Novelties Sale
Nov 9	Movie Night
Nov 9	Deadline to submit new items for GM
Nov 10	Pi Day!
Nov 10	Games with Profs
Nov 15–23	General Election 2017 nomination period
Nov 21	General Meeting
Nov 30–Dec 1	General Election 2017 voting period

University

Nov 18	Drop, penalty 1 period ends
Nov 19	Drop, penalty 2 period begins

Misc

Nov 2	Animal Crossing: New Leaf: Welcome Amiibo update released
Nov 4	Random Act of Kindness Day
Nov 11	Remembrance Day
Nov 18	Pokémon Sun and Moon released

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Thomas Baxter (Just wants his two front teeth for Christmas)
 Shaundalee Carvalho (Wants a hippopotamus)
 Amy Li (Pressuring you to stay because it's "cold outside")
 Katherine Tu (Calls Santa weird pet names like "baby")

mastHEAD

Here I am again on a Tuesday night, sitting alone in the *mathNEWS* office, piecing together articles after a long day of work, wondering where my other three (non-retired!) editors are. Word has it that ConvolutED may be "asleep" because he's "tired". Bah, I say! If only he were a robot, we would be done layout by now. Scratch that—if I were a robot, I wouldn't need to be here at all! I could be doing a thousand more exciting things right now, like sprawling across my bedroom floor and contemplating my navel. The fact that I'm not doing so, I've decided just now, is completely ConvolutED's fault, so I'll be sure to blast "All I Want For Christmas Are My Two Front Teeth" at maximum volume the next time he's in the office.

But wait—what if ConvolutED were *already* a robot, unaffected by the horrors of repetitive Christmas music, and was just lying about needing sleep? I mean, have you met the guy? You can't be sure he's really human. For one, he willingly takes combinatorics and optimisation classes, and actually understands the material. Impossible, right? As if that weren't enough, he even does the *gridWORDS* and puzzles for *mathNEWS*. There are really only two explanations for this: either he's a robot, or he's on his way to becoming a C&O professor. Actually, maybe those two are the same thing.

Okay, okay, so maybe ConvolutED is a robot. I suppose that makes Zethar a robot too, since he also understands C&O and submits puzzles for *mathNEWS* (and provided a mighty suspicious answer to this *mastHEAD*), which may prove to be unfortunate for humanity since he has supernatural powers. But they only have power over *mathNEWS* (and/or the *Nether*), which no one reads (or can visit) anyway. Now that I mention it, doesn't the CSC also have a lot of C&O majors? They could very well be robots in disguise. But wait... Even the Math Faculty has a lot of C&O professors in positions of power. How can we be sure that they're not all robots, too? Are there robots like ConvolutED lurking in every corner of campus? Are we not safe from their graphs and non-linear programs? Perhaps this is simply the beginning of the robo-apocalypse... And on Production Night, we asked our hopefully-human writers: if that were indeed the case, how would you prove that you're not a robo-clone?

Zethar("Now, you *really* expect me to divulge that?"); Theodore Bear("Hit my head against a wall repeatedly to show 1. I can bleed 2. I'm human enough to do something that stupid"); You don't deserve to know("Get murdered by my robo-clone. If I were the robot I'd be doing the murdering"); Ender Dragon("Challenge it to a game of one-shot Prisoner's Dilemma and cooperate."); Beyond Meta("I would go on a tangent about the best methodology to determine my identity"); a crafty player("Hello! This is part where I kill you!"); VPOaf("Ask a CS-related question. The one that starts crying is me."); waldo@<3.LE-GASP.ca("Try to go through airport security ="); Fluffy("shrug* I'm too dumb to prove I'm not a robo-clone."); Soviet Canadian("Attempt to dance, I am me or a malfunctioning clone, and thus no threat");

bunniED("Prove my capacity for emotion by becoming unreasonably irritated when listening to the radio during the month of December").

MathSoc Sez

Hi Mathies,

Hope you all enjoyed MathSoc's Party with Profs on Wednesday! In case you missed the event, here are some upcoming MathSoc events:

- **Pi Day:** November 10th at 1:59PM in 3rd Floor Hallway. Get ready to have some pie!
- **Games with Profs:** November 10th at 6:30PM to midnight in MathSoc C&D. It's another opportunity to have some fun with your professors and free food!
- **Novelties Sale:** November 7th–11th in MathSoc Office. T-shirts range from \$1 to \$10. Sweaters are \$25 and sweatpants are \$20.
- **MathSoc General Meeting:** November 21st at 5:00PM in MathSoc Comfy Lounge. Make sure you attend the GM to have your voice heard for Math student issues! Agenda is <https://tinyurl.com/MathSocGMF16>. If you would like to add items to the agenda, email prez@mathsoc.uwaterloo.ca. Deadline for submitting new items is Wednesday, November 9th 4:30PM.
- **General Elections for 2017 MathSoc Executives and Council:** Nomination forms will be located outside MathSoc Office and online.
 - **Nomination period:** November 15th–23rd at 4:30PM
 - **Campaigning period:** November 22nd–29th.
 - **Voting:** November 30–Dec 1 at <http://auth.mathsoc.uwaterloo.ca/Elections/Vote>

Deadlines and Important Forms

Math Endowment Funding Proposals, Funding Council Applications and Spring 2017 MEF Director Nominations are due Monday, November 14th at 11:59PM. See <https://tinyurl.com/UWMefF16>. Email mefcom@uwaterloo.ca if you have questions.

Important forms such as MathSoc Capital Improvements Fund (CIF) proposals and External Funding proposals are available at <https://mathsoc1.typeform.com/to/F0A8yp> and <https://mathsoc1.typeform.com/to/jpKGh8>, respectively. Email vpf@mathsoc.uwaterloo.ca if you have any questions.

Good luck on your midterms (if you have any left)! P.S. See <http://mathsoc.uwaterloo.ca/ExamBank> for practice midterms.

Jazbel Wang, Patrick Melanson, Peggy Zou,
Rosie DeFazio, and WenYu Xu
Fall 2016 MathSoc Executive Team

VPO Sez

Hello mathie! We now have Casio calculators in stock at the MathSoc Office (MC 3038). Their new price is \$20. But we also have correctional tape to tape away the unwanted questions. :)

VPOaf

MathSoc's Calculator Prices Set to Rise

After at least 6 years of no significant changes, the price of a couple of MathSoc's pink tie calculators are poised to increase drastically with the next re-stock.

Upon selling out of the ever more popular Casio 300MS and SHARP EL-531 X pink tie-approved models, the demand to have these models come back in stock at MathSoc has been ever present in this continuing midterm season. Unfortunately, the cost to restock these models has thrown MathSoc for a loop and the students are likely to end up paying for it.

At the start of the current Fall 2016 term, the price of the Casio was \$15 flat (i.e. taxes included) and the price of the SHARP was \$19 flat. At the time of writing this article (October 31st, 2016), the Casio is currently selling in MathSoc for \$20 flat, with the SHARP's price point poised to be risen in a similar manner (despite currently being out of stock). This price jump is incredibly significant as MathSoc has always done its best to keep costs low by selling its supplies at cost (especially in comparison to other major retail entities on campus). Unfortunately for MathSoc, the base cost of these pink-tie calculators themselves have increased to match the price that it was being sold for at the start of the current term. With the added cost to emboss the pink tie itself on the calculators, the higher costs are thus reflected in the new price.

In brief conversation with the current MathSoc executives, they did indicate that they are looking to alternatives to attempt to reduce the cost of the calculators so they won't be raised to such an exorbitant level as the Casio was raised for today (October 31st, 2016), and it can potentially be sold for a cheaper price at a later date this term. Until such a price is agreed upon and implemented, students should still shop around and find the pink tie calculator price that works for them.

As a reminder, for those that find a cheaper pink tie-approved calculator model off campus, however (and remember that there are only 3 specific models of them!!!), it will likely not come with a pink tie on it. It is thus strongly encouraged that you head to the Math Undergrad Office (MC 4022) to receive a pink tie for your calculator at least one business day before your scheduled exam that requires it. MathSoc will not be able to put a pink tie on your calculator prior to your exam.

Yours in frugality,

Paper Fold

Article of the Issue

This week's article of the issue goes to You Don't Deserve to Know for *When Shitposting Goes Too Far*. For every article you write titled *When Shitposting Goes Too Far* in v132i4 of *mathNEWS*, you will buy you a free \$25 gift card, to be picked up in MC 3030.

The Editors

The Quirky Coach

Should you work for a start-up or a large company?

My career began in a 4-person start-up. In a company that small, you get to do everything! I designed and built servers, end-user applications, and low-level drivers. I trained customers and provided technical support. I even wrote some marketing literature and sections of the product manual. It was a fantastic, rapid learning experience.

The downside of choosing a start-up is that the company may not succeed, and this one didn't. After three years, I lost my first full-time job.

Another downside is that the staff in some start-ups can be mostly junior. This wasn't the case for me, but has been the case for others. Since funds in a start-up can be tight, hiring junior staff whose salaries are lower is a popular thing to do. As a result, in some start-ups there are few senior staff from whom to learn. In my opinion, the best way to learn is to work with more seasoned colleagues, so before you work at a start-up, explore the balance of senior and junior staff.

My next job was at a 6000-person company. The advantage of a larger company is that there are lots of other people with whom to interact. Many are in different countries and so there are opportunities for travel (and cultural faux pas). Since funds

are more readily available, larger companies can offer better benefit packages. You can also move around within a larger company. If you get tired of the project you're working on, the company is large enough that you can find a new job without leaving the company.

The 6000-person company got acquired by a 70,000-person company. Suddenly I worked for a mammoth. A company that large can offer even more varied opportunities to move around the company. The disadvantage of a company that size is that it is difficult to get your accomplishments recognized, especially if you don't work in the head office.

I now work as an independent software architect and mentor. You can't get any smaller than a company of one. The advantage of being a consultant is that I can work from home (while doing my laundry) and I choose my own hours. Sunny today? Off to the trail. Rainy tomorrow? Hard at work. The disadvantage is that you have to find your next consulting gig and so income is on and off.

When looking for your next job, consider the pros and cons and choose the type of company that is the best fit for you.

Debbie Smith, UW Alumna

Desert Bus for Hope!

You enjoy skits, hijinks, and charities, do you not? Of course you do! Why not spend your study breaks with the Vancouver-based comedy group LoadingReadyRun as they play the worst "video game" in existence, Desert Bus, and watch as they entertain themselves and you by doing skits, challenges from viewers, and auctions on cool stuff. They will keep the party going day and night so long as donations come in, so try to keep them awake for a whole week straight. It is all for the children (and your amusement), so tune in to desertbus.org starting on Saturday, November 12th at 1:00PM EST.

Soviet Canadian

Errata: Schrödinger's Blue Jays

Estrada pitched six innings instead of seven. Whoops. And there was not quite the clairvoyance stated in the Editor's Note: the article was written the Monday night prior, so information was up to the end of Game 3. Had it been written before Monday, there would've been four possible options of the Jays: 0-4 sweep, 1-4 loss, 2-3 down, and 3-2 up! The Jays could've won all three games at home...

(Also, I forgot the word "start" in one of the sentences. Oh well.)

Scythe Marshall

Games Sez

Remember: this Thursday, November 10th, we will be having Games Night with Profs: Pi Day Edition!

So invite all your favorite profs to come to the C&D at 6:30PM, play their (and your) favorite games, and eat the most lavish and mouthwatering collection of junk food you can imagine!

See you on Thursday! (And, of course, see you every Thursday after that!)

the less competent one

N Articles Which Could Have Existed If Not For Writer's Block

- Man Says Something on Television; Somehow People Still Listen
- Midterms Claim Twenty-Six Lives, Soon to Overtake Goose Attacks as Greatest Problem
- Webcomic Hasn't Updated For a Year: Fans Cry for More Kat
- Zethar Writes For Issue Without Using Diacritics: Editors Suspect Doppelgänger [Wait, never mind.—*ConvolutED*]

Zethar

An Introduction to Comprehensive Exams

Hello! If you're a student looking to eventually get a Ph.D, you may or may not wish to read this article. It contains (rather than being "full of", which was the original wording) potentially useful information for you about a requirement that many universities place on doctoral students. However, this information is terrifying. Your choice. If you are not in the above category of readers, then by all means, continue reading!

Okay, so, what is this article about? Good question. The first thing to understand is that doctoral programs are structured differently literally from department to department, not just in different universities but even within a specific university. However, most programs have the same basic building blocks. In math, specifically, most (but not all) Ph.D programs in North America consist of the following requirements:

- Some amount of coursework;
- "Candidacy" exams;
- A dissertation, with an oral exam.

There is a distinction between a "Ph.D student" and a "Ph.D candidate"; namely, if you are a "candidate", that means that you have proven that you possess a sufficiently broad and deep knowledge of your general discipline, and are then eligible to complete your degree by finishing your dissertation. A "student" has not yet reached that point. Each department, as mentioned, defines "candidacy" differently, so these terms are somewhat fluid. Universities sometimes do not have a candidacy requirement! So you just work on your research.

Close to the beginning of your doctoral program, occasionally universities will have you write what are sometimes called "preliminary" or "qualifying" exams. These exams are like gateway exams, similar to entrance exams. Their content is usually at an upper undergraduate level; they are used to have you prove that you can do more and succeed at a Ph.D level. Sometimes, if you fail these, you still have the option of completing a Master's degree (as a sort of consolation prize; in Canada, a Master's is often considered a mandatory middle step, but in other countries you proceed directly from an undergraduate degree to a doctoral program).

Then, closer to the end of your second year of a Ph.D, you will write what are usually called "comprehensive" exams. There are usually fewer of these to pass; sometimes they are oral exams, based on topics or on a research proposal, and sometimes they are written exams, based on specific areas of your field of research that are necessary to know to succeed.

It should be noted that "comprehensive" exams are called as they are because they test a comprehensive amount of background knowledge. You really do need to know almost everything. Interestingly, sometimes "exams that you need to pass in order to be eligible to keep going and write your dissertation" are referred to both as "comprehensive", and "candidacy", and sometimes (though thankfully not often) even "qualifying", depending on the structure of the program. Because of this

terminology failure, it's important to talk to an advisor or grad secretary to make sure you know what your specific department does. In the writer's personal and not-at-all humble opinion ("wrong" is probably also a word to use), "qualifying" should be used to refer to entrance-like exams, and "comprehensive" should maybe be used to refer only to written exams, and "candidacy" should refer to the exams you need to pass in general, be they oral, written, or whatnot

Some departments, especially larger ones with sizable graduate student populations, have you (and your large grad student cohort) proceed through the same set of courses together, and at the end of them, you all write some subset of comprehensive exams that test your knowledge of these broad areas of mathematics. Then, there is a project proposal defense later, which completes your candidacy. Other departments have you self-schedule your candidacy exams, and only require written comprehensive exams or similar. The variety of possible scenarios is vast.

So, we have talked about what these exams are. The remainder of this article will focus on the daunting task of making damn sure you pass them. The analogy is this: imagine taking all three of PMath 347, 348, and 446 (Groups and Rings, Fields and Galois, and Intro to Commutative Algebra; substitute three related upper-year courses in a different area if desired) in the last two years of your undergraduate degree, waiting two or more years, and then trying to relearn it all in order to write an exam testing material from all three courses.

Wait. There's no analogy there. Modulo names and numbers of courses, this is exactly my situation, and uh, it's distressing. Here are some tips!

1. Start studying early. Like, start rewriting and consolidating notes and looking at problems early, don't just try reading Lang's *Algebra* and expect that to do the trick. It doesn't, though it can be helpful.
2. Get a study group together! Work on exams and meet once a week. Talk about the problems and related material, and try to help each other, not just via motivation but also knowledge sharing.
3. Try to avoid doing too many things in the few months before your exam. Namely, make sure you aren't spending all of your time trying to balance TA work, research, an unrelated course, extracurriculars, and multiple seminars.

If you follow all of these tips, congrats, you'll probably be less stressed about these exams than I am right now! If you don't, well, uh, right.

If you still intend on aiming for a Ph.D, please do! It's a tough experience, in terms of challenging work, but it's rewarding. Unless, of course, you have a terrible personal experience because of the university or department or your supervisors discriminating against you and your fellow graduate students, but that's less about the exams than about the people. Don't blame the exams for the people.

What To Do If You Don't Understand Your Assignment

There it is—your assignment. In rare bout of productivity, you go on Learn, ready to complete it. You take out your lined paper and pencil. You read Question 1, only to find out you have no idea how to do it.

You decide the most reasonable course of action is to sleep on it. You vaguely recall some psych study you heard a few years ago about how sleeping is good for problem-solving. So you go to sleep, but don't sleep as well as you should because some demonic bureaucrat of the administration decided that 8:30AM classes should be a thing. You wonder if your inability to do assignments might have something to do with the fact that you are half unconscious during class.

After class, you stare at the assignment again. You find the thought of being confronted with ignorance very stressful, and feel a strong need to relax. You decide to watch the latest episode of the TV show that just came out.

You look at your assignment again, and you still don't know how to do it. For some odd reason, the TV show did not give you better insight on how to do proofs in pure math. You decide that you should instead write a *mathNEWS* article about this. While writing this article, you have a talk with Scythe Marshall who has to know the material for his comprehensive exams that he may be freaking out about. With his help, you actually get your assignment done and get a *mathNEWS* article out of it.

Beyond Meta

Localized Subjective Normality

If someone random was sent along to shadow your social life for a week, how long would it take them to find something strange? When they start meeting your friends? Going to the same clubs or parties? How long did it take for a specific person or group to come to mind once you thought about it?

The idea of what is normal is based around our expectations, and we often don't even notice when those expectations for people or groups change. Groups develop internal cultures with their own jokes, rituals, and references, as well as expectations for what topics and actions are normal. This is how you can find yourself out doing the most random things with people and not noticing how odd it might be. This is also why meeting new groups can be jarring at times.

Now that you are thinking about this and are aware of it, have fun noticing how odd you and your friends can be.

Pockets

Armathgeddon

One Wednesday morning, Laurier students assembled to show their school pride, pulled out their newly-created cannon, and prepared for attack. The long-standing rivalry between schools was to finally come to an end. As they polished their cannon balls, UWaterloo students continued to study, taking no notice of their impending doom, because, like... UWaterloo students got shit to do.

Laurier students set up the first target: DC. At 0800, it hit, and DC went tumbling to the ground in a pile of red, yellow, and blue. Their next shot was lined up: M3. It shattered into oblivion. Next, they aim their sights at MC. The cannon ball falls with perfect aim... but MC is unscathed, not a single lecture disrupted.

Meanwhile, lectures went on in MC, no one the wiser. Shot after shot was fired at MC to no avail. The building was indestructible and the students blissfully unaware. Tired and apathetic, the Laurier students gave up and went home.

Wednesday night, the math students emerged from MC. Defeated and defenseless, they walked home, unaware of the destruction that had occurred. They walked home, heads down, headphones in, not noticing the carnage where DC once stood.

Thursday morning, UWaterloo moved on, lectures scheduled as normal, and—like cockroaches—the geese soldiered on.

Laurier classes were cancelled for the week.

G-UNIT

Trump Now Ticking Back Up In The Polls

After a long dry spell for Donald Trump in the polls, he's been starting to tick back up quite aggressively in the past few days, going from an 11.9% chance of winning two weeks ago to an astounding 24.6% on October 31, according to Five Thirty Eight's poll forecast.

The only question I can ask is: why? He did so badly in the debates, and nothing he's been doing since then has been particularly redeeming; what is drawing people back to him? What are the scenarios in which he could win? All the electoral vote models on 270towin.com currently have Clinton with at least 270 likely-or-confirmed votes, which is enough to win the election, so I'm pulling my hair out trying to figure out how they made the model work out to Trump having anything near a 25% chance of winning.

Help me out here.

Ender Dragon

Follow us on Facebook (MathNEWS), on Twitter (@UWmathnews), or in person (MC 3030)!

What's Wrong With My Stove?

Or: Why You Should Actually Think About Algorithms in Your Code

My recently-acquired stove works pretty well, for the most part. The stove-top elements work (though the one labelled "power boil" doesn't exactly do that? And there's nothing in the manual about it), the oven works (though the racks don't slide out easily), and really, it hasn't caught fire or anything yet, so that's all good. There's just one thing that's bothering me, presently: the timer is broken.

Not broken as in it doesn't do anything, but broken as in programmed unexpectedly. Why, you ask? Well, consider setting a timer on your phone. I'll wait for you to get your phone out of your pocket or bag to play along as you read. Good? Okay. Find the timer function, and set a timer for ten minutes and zero seconds (00:10:00). Set it going. What's the first thing it does?

It turns out that there are two possible situations. One is that it rolls over to nine minutes and fifty-nine seconds (00:09:59), and continues to count from there. The time it's showing you is the time that is left before the timer ends, modulo some positive number of partial seconds between 0 and 1. When this timer gets to 00:00:01, there $1+\epsilon$ seconds left, where ϵ is between 0 and 1; the next step is to switch to 00:00:00, wait for a second, then beeeeeeeep.

The other situation is that it starts, waits for a second, then switches to 00:09:59. This is akin to counting down aloud: "Five! Four! Three! Two! One! Ready or not, here I come!" Each time a new number is shown or said, that is the number of seconds left. So when you say "One!", the next part of the countdown is that it's over; there is exactly one second left. Your exercise is to determine which of these situations applies to your phone's timer app.

Now, what's going on with my stove timer? Well, first off, there are only four digits in the timer display. It looks like hh:mm; you can set a timer for say, 01:20, and that will be a timer for an hour and twenty minutes. However, when it displays times less than a minute, it switches to mm:ss, i.e. it displays seconds. This is not uncommon, as far as I'm aware, regarding stoves with digital displays.

The actual problem is the following situation. I set a timer for 2 minutes, by setting 00:02 and pressing "start". It proceeds to sit at 00:02. Okay, fine; it's counting like it's playing hide-and-seek, except that it's counting minutes and not seconds. I'm not sure I agree with that, but because there is the constraint that it has to be able to show hh:mm, this is how they chose to do it to be, to avoid being somewhat vague.

However, in this case, what should happen when it hits one minute left? If it were actually counting minutes down, it would change to 00:01, and sit there for a minute, silently and invisibly counting the seconds down until it hits 00:00, at which point it beeps and the timer is over. This actually is a nice resolution: the hh:mm designation never changes, and when you see "00:01" you know that there is at most one minute left, and you should get ready to deal with what happens when the timer ends.

This is not what happens with my stove. Instead, after what seems like 59 seconds (I did some testing), it changes to 00:01, then changes again to 00:59. So because there is less than a minute left, it switches to 00:ss to count down the remaining seconds. But it somehow has to do this weird switching from 00:02 to 00:01 to 00:59 without losing time, which means switching from 00:02 to 00:01 early? I think?

This seems somewhat unnecessary. Why not just program the timer as in the first situation; you hit "01:00 Start" and it drops to 00:59 left, waits a minute, drops to 00:58, etc; eventually it will reach 00:01, wait a minute, then change to 00:59 and count down in seconds. Even better, if you're going to use both hh:mm and mm:ss: if the time is 59:59 or less, display the time only in mm:ss! Then you will always be counting down by seconds, displayed so that you are never confused about how much time is left.

Part of the issue is that there is only a four-digit entry. So any timer you set will automatically be set for hh:mm. However, computers are smart if programmed correctly; they can convert 01:00 (entered in hh:mm) to 60:00 (displayed in mm:ss). Units shouldn't be an issue. However, another part of the issue is about how counting should work in hh:mm compared to mm:ss. There is likely some sort of cognitive dissonance for many people upon entering 01:15 for the timer, and the timer immediately dropping to 01:14 (as it would if it had a six-digit display: 01:14:59). It feels like the timer is immediately wrong! We don't experience this if we can see the remaining portion of the time that is counting down; hence mm:ss, where time is counting down in seconds, does not run into this issue.

Of course, I'm not "many people", and this way of running a timer upsets me, because I dislike the inelegance of the implemented solution. Moreover, I don't experience any cognitive dissonance when setting timers, because I visualize the timer as extending to seconds without even thinking about it. I just do. It turns out that people really did think, probably, about the algorithm used in the timer. They even considered how people view time and timers, and took that into account when making the decision about when to switch from hh:mm to mm:ss, and how to count down in either system, and how to bridge the two systems.

This is where the subtitle of the article comes back: if you implement some random code without thinking about what it actually does or why you're doing it or how your code will be affecting both the end users and the related systems, you'll end up breaking things. Instead, strive to handle the general cases well, and think about people the next time you try to handle edge cases. It turns out that spending a bit of thought on others can really help develop products that are more useful than not.

As for what's wrong with my stove? Sure seems like it's the owner.

Scythe Marshall

Lightning Stats

A Story about Maple TA

It was a warm autumn evening sometime in the middle of the term; exactly like the various others with the same descriptors, except on this particular one a distressed individual sits in a musty office with a tired one. The clock ticks: down the metaphorical grains of sand flow from the top bulb of the hourglass as confidence intervals are reviewed, hypotheses are tested, and p-values explained. The class notes deciphered, there was but one thing left to do before retiring for the night. The Maple TA questions must be completed.

The gatekeeper promised that they were review of concepts from class, and one would have as much time as they needed to complete these questions. Instead, as the pair discover, the trial was like traversing the Duat: the questions were timed, and bore very little correlation with the course material being covered.

It was a maze of haphazard questions, of half-remembered aphorisms in statistics which don't see the light of day. Cries of "Riley Metzger" could be heard, ringing louder as the system throws yet another question about some property which links student's t -distributions with F-distributions (come to think of it, does STAT 231 cover F-distributions any more?), or getting some poor sap to try and calculate $F(5)$ when F is a Poisson distribution. No, nobody wants to add five terms which are very easy to mess up inputting on a calculator or estimating the incomplete gamma function, and doubly less so when one can only allocate two minutes to each question.

Each section was a cacophony of paper being moved and furious button pushing to beat the time limit. Every other question was a realization that 120 seconds was nowhere near enough to talk about the statistical trivia being tested to beget understanding—much less talk about how said piece of trivia might, in some the-stars-are-aligned situations, be marginally useful in the context of the course. Sure, they might be important elsewhere in the expanse of statistics, but that's not what this course is about.

Daybreak. A break for breakfast is made. Resurfacing from the murky mire, the twisting passages lain by the cursed program distorting the vision of the architect professor, a bell tolls for the halcyon days liberated from the task. Alas, it was brief, and the labour begins anew.

Ultimately, the duo concedes under the iron fist of MapleTA, waving its ill-gotten hourglass maniacally. Retiring to fight another day, they retreat, and morale suffers for it. Given the choice of an actual trip through Duat and redoing the labour of lightning stats, at least the former one is allowed to be equipped with a scroll of power and a cheat sheet, while the latter your cheat sheet is useless in the face of figuring out why knowing the definition of "mesokurtic" is important in a branch of statistics where you don't know the underlying distribution.

Ugh.

Zethar

When Shitposting Goes Too Far

October 31st, 2016 will surely go down in the annals of the internet as the advent of the greatest shitpost of all time. Being Halloween, [reddit.com/r/pokemon](https://www.reddit.com/r/pokemon) decided to remove all rules from the subreddit and host "The Limited Edition Spooky Fire/Fighting /r/Pokemon Halloween Shitposting Purge Competition Extravaganza & Knuckles." At first this involved your standard, low-quality shitposts: Donald Trump, Harambe, and way, way too much Alolan Exeggutor. Then, faster than anyone could process, something magical happened.

User PassingThroughRider made a post offering to buy a copy of Pokemon Sun and Moon for anyone who upvoted and commented on his post, claiming to be "rich and bored." PassingThroughRider originally aimed for a humble one hundred upvotes, and presumably a similar number of comments. At the time of writing the post stands at 6042 points, down from around 13,000, and 90,589 comments. Given that the Pokémon games are being pre-sold for \$49.99 CAD each, PassingThroughRider owes the good people of /r/pokemon a mere four million, five hundred

and twenty-eight thousand, five hundred and forty-four dollars and eleven cents in 3DS cartridges.

Some interpret PassingThroughRider's post to mean that he will buy every commenter one copy of both Pokémon Sun and Pokémon Moon each, bringing the total to just above nine million dollars Canadian. PassingThroughRider has made no remarks as to when, if ever, the money will be paid out. Many say this was just a shitpost, and there never was going to be a payout. Some seem to be in the "just in case" frame of mind, and commenting away, praying for a chance at a free Pokemon game. Others still, not wanting to miss the latest trend, have started imitating PassingThroughRider's already legendary post. These posts offer anything from more free Pokémon games to fighting PassingThroughRider to the death. Whatever the results of the original post may be, this will surely go down as a truly fabled day in the glorious history of shitposting.

You Don't Deserve to Know



the winter sock

Darker Than Blackmail: Part 4

Formerly Known as "The Record's Sultry Serenade"

The first thing I noticed when I woke up was that I couldn't move. Knowing my business, I was probably tied to a chair. My head still ached from getting assaulted by a frozen salmon earlier. I groggily opened my eyes, finding them enveloped in the darkness they had just left. As my sight started adjusting, I made out that yeah, I was tied to a chair. The room I was stuck in was pretty barren. Not able to do anything else, I spat out the blood that had pooled inside my mouth.

I heard a door open up behind me, sending in enough light that I could see my shadow in front of me on the floor. A single light above me flickered on; I squinted as the dull bulb burned my eyes like hydrochloric acid. I heard the familiar noise of a chair scraping across the cement floor. The figure of a man passed across my vision; his black suit was the only thing I could make out. From what I could hear, he wasn't alone, no doubt he was being accompanied by the two goons who ambushed me earlier. He placed the chair in front of me, backwards, and sat down on it, resting his arms on top of the back. That's when I found myself face to face with the most powerful man in the world.

Elon Musk.

"I'm sorry for the... behaviour my associates showed to you, Mr. Bear," the Silicon Valley entrepreneur told me.

"Apology accepted," I said through gritted teeth.

"Don't be surprised I know who you are. I had my men look through your wallet earlier. I'm afraid I had them take all your spare change while they were at it." That meant I was down 3.46\$. "I know you're working for Ms. Bradshaw, and I knew that anyone hired by her would insist on buying the seat B-0 to this concert. Well... if they knew what they were doing, of course."

"Tell me, Mr. Musk, what does the CEO of Tesla Motors and SpaceX doing blackmailing some dame from Toronto? And what do you want with me? And furthermore, why did your guys knock me out with a frozen salmon? Couldn't you have just had them use a lead pipe like normal people?"

"I'm very sorry about that: having to knock you and everything." The chairman of SolarCity actually looked almost sincere. "I wanted to meet with the person Ms. Bradshaw hired. To talk with them. I want to convince you to go back to Ms. Bradshaw, and convince her to pay me, that no private detective would be able to get her out of giving me the money. As for the fish, Tesla ended up buying a shipping company a while back, and I had no idea of what to do with all the excess fish that came with it. So I gave it to my men to use as weapons."



the math soc

That explained the fish, I thought, as I stared into the eyes of the man behind the hyperloop. "How much are you stringing her along for?"

"Five thousand dollars."

"Why the hell do you need to blackmail someone to get five thousand dollars? Wouldn't you make that kind of money in a second?"

"It would take me five millennia to make that account." I had forgot that Elon Musk's salary was only \$1 per year. I then realized that that wasn't the point, and asked him why he would need five grand from Bradshaw. Couldn't he get it somewhere else? And more easily for that matter. "You see, Mr. Bear, I'm trying to build a rocket, so I need all the money I can in order, even if it comes from blackmail or the wallets of private detectives. It's for a good cause, you see. With my rocket, I will fly into a black hole to travel back to the beginning of the universe, so I can seed the planet Earth with my DNA, turning all of humanity into variations of myself, the most perfect man there is, so that human race will willingly turns themselves in cyborgs. I could tell you more, if you want?"

"It's a pretty cool plan," I told the co-chairman of OpenAI. "But please don't talk about it anymore. It doesn't make sense in film noir. Can we stick to, you know, the blackmail angle?"

"Of course. What I'm trying to say is, you can't save her, Mr. Bear. When you took this case, you had no idea I was involved in this, and so thought there was hope. But now, I think you realize that this game is already over."

He was right. When I decided to take on Ms. Bradshaw's case, I had no idea I'd be going up against the 83rd Wealthiest Person in the World. I told him I'd pass his message along to Bradshaw, and that I'd hand over the money myself. He smiled, and we agreed that the exchange would take place at the Beatles concert the next night. Then he let me go. I walked to the nearest payphone, which took me 3 hours, and called up my client. I told her to meet me on Bloor outside the ROM at 6 o'clock tomorrow, and to bring five thousand dollars with her. I told her to get the money whatever way she can, even a payday loan place if she had to.

It didn't matter. Despite what I told Musk, I wasn't prepared to sell out my client. That's the main rules of being a private eye. And no billionaire inventor was going to make me break that rule. Not when my performance evaluation was based on it.

Theodore Bear

profQUOTES

- "A friend is someone who has access to your private parts..."
Avery, CS 246
- "So how did Petersen disprove this conjecture? He thought: 'Maybe I'll try this graph that's named after me!' No, that didn't happen in that order."
Geelen, CO 442
- "This matrix is so special that there's a special Belgian name for it: Vandermonde. It's named after some guy whose name you can guess."
McKinnon, MATH 245
- "I will have you brainwashed by the end of this course. You will think that statistics is the best course in the world."
Metzger, STAT 322
- "I can't count. That's not important for a mathematician, is it?"
Metzger, STAT 322
- "You're not falling asleep, are you? This *is* a stats course—it's how I put my kids to sleep."
Metzger, STAT 322
- "And you thought you could sleep in class... Save that for your arts courses."
Metzger, STAT 322
- "Constants are worthless! Tell that to Avogadro... Or tell it to gravity, I guess."
Metzger, STAT 322
- "That [result] is beautiful! It's almost as beautiful as my wife... *Almost.*"
Metzger, STAT 322
- "I have ten calculators in my office, but I really only use R."
Metzger, STAT 322
- "I don't have free candy, but I *do* have free clicker marks!"
Metzger, STAT 322
- "Today, I'm dressed as a blackboard, but this is just how I dress everyday: all black and covered in chalk dust."
Metzger, STAT 322
- "Go see the TAs. They don't bite. They're younger, so they have smaller teeth."
Metzger, STAT 322
- "Those are symbols, so I am going to put underscores below them. [*Turns "-" into "=".*] No, that's terrible for minus."
Moosa, PMATH 433/733
- "If you're awake and you see a δx , you should *smell* the calculus coming soon."
Morris, AMATH 390
- "Raising your eyebrows helps get you higher musical notes."
Morris, AMATH 390
- "You only need to write a paragraph or so. Just be sure that you write something that sounds intelligent enough and relates to the course."
Morris, AMATH 390
- "Sometimes you want to add, sometimes you want to multiply. In life, it's mostly subtraction."
Pei, MATH 239
- "Am I allowed to do this? I hear the silence of disapproval."
Pei, MATH 239
- "My favourite sushi roll is eel. I don't know why I'm telling you this... It'll probably be on the final exam."
Pei, MATH 239
- "This is Windows 8.1, by the way. I refuse to add the 1.9."
Pei, MATH 239
- "My laptop survived the experiment! I'm kind of disappointed. I was hoping that it would break down so I could get a new one... that the school would pay for."
Pei, MATH 239
- "There's one minute left in class. Am I really that bad that you want to leave me? I have no friends, so what else am I supposed to do?"
Pei, MATH 239
- "We jumped the gun here... That feels like an American expression."
Pei, MATH 239
- "If there's a museum of glass, would you be able to see anything?"
Pei, MATH 239
- "I don't work in Racket deeply enough to know how to debug this. For example, there is this 'debug' button at the top of DrRacket; I don't know what it does."
Prabhakar, CS 245E
- "If somebody asked you, 'Quick! Tell me a positive definite matrix!' you'd probably say *I*. Unless you didn't know what positive-definite meant. Then you'd just run away."
Vavasis, CO 367
- "I'm feeling pretty dizzy today, so if I fall over don't laugh. And no, it's not because I've been drinking. I would never do that this early in the morning."
Wehr, PSYCH 101
- "There's no cure for stupidity. Trust me, I'm stupid."
Wilson, PMATH 420

The Rocky Horror Picture Show: A Halloween Classic

As I'm writing this article, it's a Monday night, and, in a couple hours after this Production Night, I will be heading out to see a (close-to) midnight showing of The Rocky Horror Picture Show, and I expect I will have a fun time. Since its release in 1975, the film has taken the world by storm, becoming a cult classic that holds the record of the longest theatre release in film history. Due to its spooky subject matter and campy nature that harkens back to the B-movies of the 1950s, wrapped in with some truly catchy songs, the film is quite popular around Halloween.

For those who aren't aware, the film is an adaptation of the British musical The Rocky Horror Show, written by Richard O'Brien, who played Riff Raff in the original stage production, and reprises his role in the movie. The film's plot centres around the recently engaged couple of Brad Majors (Barry Bostwick) and Janet Weiss (Susan Sarandon), better known by their nicknames of "ASSHOLE" and "SLUT" (which are often shouted at the characters during productions of the show or showings of the movie), a newly-engaged couple from Denton, Ohio, who are forced to retreat into a strange castle when their car breaks down. Inside, they meet the mysterious Dr. Frank-N-Furter, played wonderfully by Tim Curry, and his servant, Riff Raff (O'Brien) and Magenta (Patricia Quinn, putting on an incredibly thick accent), and become entangled in Frank-N-Furter's web of debauchery as they beginning questioning their sexualities.

The story, written by O'Brien as he came to terms with his own sexuality, is loved for its delightful weirdness that involves its

characters really getting around, and for teaching people that it's okay to be different and weird. Another highlight of the film that has taken a life of its own is the song The Time Warp. Even before I watched the film back in high school, I had heard the song as it was always played at my school's Halloween dance. It's likely that, for you reading this, even if you haven't seen the film, you've probably heard the Time Warp somewhere. After all, it's just a jump to the left. It's not the only good song from the film; other greats from the soundtrack include: the opening song, Science Fiction, Double Feature; Frank-N-Furter's introduction song, Sweet Transvestite; and the rocking Hot Patootie, Bless My Soul, sung by Meat Loaf, of Bat out of Hell fame (that's a very popular album from 1977. Your parents probably have it).

Showings of the film are also known for the audience participation. Audience members are encouraged to yell at the characters, throw things at the screen, and get up and do The Time Warp, when the song comes on. That's why I'm so looking forward to tonight's showing, and that's why I suggest that you, even if you've seen the film on your own, go out to one of these showings. If you haven't the film, I suggest you watch it by yourself, or a group of friends, then go out and watch it with a theatre full of people. Showings are known to get rather loud.

So, this is Theodore Bear, signing off, and ready to head out to the late night, double feature picture show.

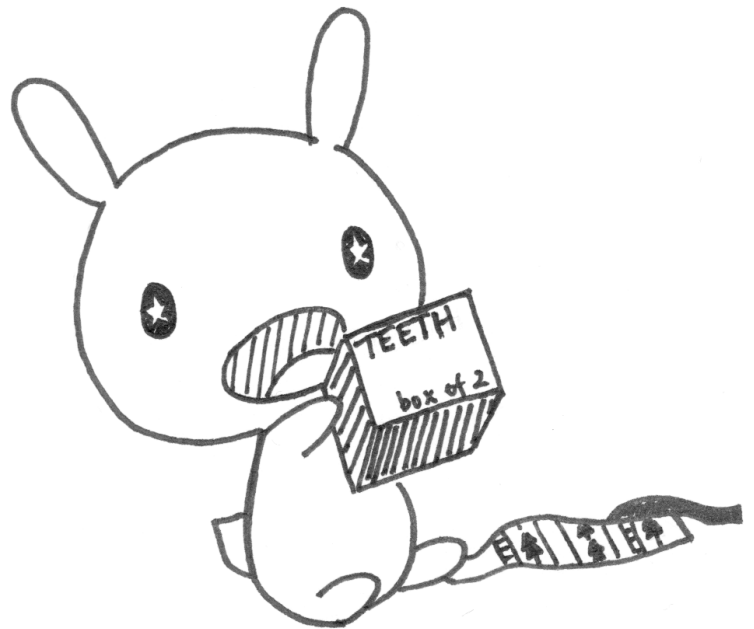
Theodore Bear

Last Issue's Solution:

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

Things Overheard at mathNEWS

- "Okay, let's not compare pizza voting to war crimes."



Send us your articles, profQUOTES, Sezzes, gridSOLUTIONS, and gently-used Halloween costumes to mathnews@gmail.com or to the BLACK BOX outside the MC Comfy. We would love to publish them!



gridCOMMENTS

Hello, to solvers both intrepid and tepid! I think I've been hitting upon the sweet spot for *grid*QUESTIONS recently by allowing everyone a chance to stretch their imagination in their answer, because I've been getting some really great answers!

The award for last issue goes to **Matthew Lapointe**, who thinks a great charm should be "**cast by a handshake and a, 'Nice to meet you,'**" which causes those under the spell to perceive the caster as "**eminently qualified**". What a wonder for getting through a stressful Jobmine cycle! Come by MC 3030 for your prize!

This issue's *grid*QUESTION is of no relevance to the grid at all; it's just my idle (and not suspicious at all) curiosity. "It's the ROBOT APOCALYPSE and you are confronted with a robot clone. How do you prove to everyone that you are the human?"

As always, please submit your *grid*WORD solution, as well as your *grid*QUESTION answer either electronically (to mathnews@gmail.com) or physically (to the **BLACK BOX** on the wall by the Comfy Lounge) before 6:30 PM on Monday, November 14th. Your ability to prove that you are not a robot will be the tiebreaker.

ConvolutED ("Re: the robo-question, I plead the fifth.")

gridCLUES

Across

1. Aims
6. Barrel for wine or whiskey
10. Clumsy or out of shape
11. Dad for Thor
12. Florida city known for Heat?
13. Ferris Wheel or Tilt-A-Whirl
14. Toy of 1960s USA, and inspiration for a Kendrick/Timberlake movie that opens today, November 4th!
16. You're supposed to move it from right to left when you receive your diploma
17. Movie gimmick that makes theatre-goers wear funny glasses
21. Author of *Charlie and the Chocolate Factory* and *Matilda*
25. Bus driver in *The Simpsons*
26. =
28. Chirp from a chick
29. Cuban dance meaning 'party'
30. Ultimatum's ultimate word
31. Smart-mouthed

Down

1. Bubble material, sometimes
2. "Hurry up! Step ___!"
3. Way out there
4. L o n g car
5. Wooden and unnatural
6. Parachute pullstrings
7. Spanish 'Sayonara!'
8. Keep moving onward, when your back's against the wall?
9. Ring, slowly and solemnly
15. Firefighter's climbing frames
17. Convention or cliché
18. Monopoly piece
19. *Yelps* about, say
20. Run away to get married
22. Light blue
23. Forgets the lyrics, so keeps their mouths shut?
24. If you think your hour-long tutorials are boring, ask a science student about their six-hour-long ___
27. Set down

This Week's Grid:

1	2	3	4	5		6	7	8	9
10						11			
12						13			
	14				15				
				16					
17	18	19	20						
21						22	23	24	
25						26			27
28						29			
30						31			

profQUOTE Submissions

Quote:

Professor:

Course:

Quote:

Professor:

Course:

Quote:

Professor:

Course:

Submit your grids and *prof*QUOTE submissions to the BLACK BOX (outside the Comfy Lounge) or mathnews@gmail.com.