

# *math* NEWS



**New showers in M3: Mathies, meet Hygiene**

*Volume 116, Issue 6*  
*Friday, July 22nd, 2011*



**lookAHEAD****mathNEWS**

July 22	Issue #6 calls it a day
TBD	EOT (check your email!)

**MathSoc**

July 22	Pi Approximation Day
Tuesdays	Games Night in the Comfy at 6:30pm

**Campus**

Monday	Cheap ice cream at Fed Express
July 26	Last day of Classes
August 2	Exams begin
September 3	Froshlings start appearing on campus
September 4-8	First years get brainwashed into thinking that UW's the place to be
October 13	First years get a rude awakening about how university is like with the return of the first midterm marks

**Misc**

August 1	Civic Holiday, but you weren't going to be working anyway
August 15	Holy Shit, vacation's here!

**Need music? Come listen!***Waaaaldo looooooves to siiiiiiiiiing!*

The much anticipated A Capella Club's End of Term Concert has been scheduled TODAY (July 22, 2011) at 8 pm in the Modern Languages Theatre. All companies (the Waterboys, AcaBellas, Unaccompanied Minors, and UW ACE as well as some awesome quartet ensembles) are excited to perform new songs for your enjoyment.

Tickets can be purchased at FedS during regular university hours today or at the door for only \$5! If you feel like taking a break from your pre-exam panicking, come on out! That is of course, unless you're ConED and CorruptED, who are going on a couples retreat.

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**ISSN 0705—0410**

*mathNEWS* is normally a fortnightly publication funded by and responsible to the undergraduate math students of the University of Waterloo, as represented by the Mathematics Society of the University of Waterloo, hereafter referred to as MathSoc. *mathNEWS* is editorially independent of MathSoc. Content is the responsibility of the *mathNEWS* editors; however, any opinions expressed herein are those of the authors and not necessarily those of MathSoc or *mathNEWS*. Current and back issues of *mathNEWS* are available electronically via the World Wide Web at <http://www.mathnews.uwaterloo.ca/>. Send your correspondence to: *mathNEWS*, MC3046, University of Waterloo, 200 University Ave. W., Waterloo, Ontario, Canada, N2L 3G1, or to [userid.mathnews@student.math.uwaterloo.ca](mailto:userid.mathnews@student.math.uwaterloo.ca) on the Internet.

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The Five parts of the Shower Kit: Towel, Soap, Shampoo, Conditioner, Flip-flops, representing Will Morrison, Harrison Gross, Sacha Koohgoli, Michelle Conway, and Jeff Bain.

**mastHEAD***It's too hot!*

Back in Issue 2, we were complaining about how it never seemed to have stopped raining. We were worried that the rain was going to go on for forty days and forty nights and when we would wake on the forty-first day, the geese would have claimed all of the campus for themselves. That, and the computers would be down.

Well, we've reversed our tune now. It's now too sunny, and if the grass in the DC Quad was any yellower we'd have to start calling it a coward. The sun now beats down on us, threatening to turn this once fertile land into a barren plain where nothing grows. The heat would turn everyone into a human raisin (except for those in the computer labs, of course). Would it kill us for a little bit of rain, because we're not sure for how much longer we can last. The ice cream supplies are running low, and the computers are starting to overheat.

While we slowly transform to dust, we will leave you with the following question to distract you from your imminent doom: "How are you coping with the heat?"

(define this(not cool)) ("It's the status quo: I'm always hot"), Impulse Vector ("With suspiciously frequent trips to the chemistry labs. Thank you, Liquid Nitrogen!"), waldo@LE-GASP.ca ("In the same way I was able to wear a sweater in gym class for nearly all of my high school career including summer and winter [GRAND TOTAL OF DAYS NOT WEARING A SWEATER: 3]"), BlueberryMuffin ("Watching March of the Penguins"), Concealed ("Hiding in the server room"), !able ("By moving with as much VeloCity as possible"), cbhl ("I like AC!"), MustardMap ("By driving an armoured tank through a river"), Zethar ("Spontaneously combusting and rising from the ashes. Repeatedly"), (n-k)! ("Hiding in the cold aisles in the server room."), ConED ("Turning on the A/C for the first time all summer"), GroovyED ("Lemonade"), MeaninglessQuips ("Rendering body temperature higher than surroundings. Outside feels pretty cool. And shirtlessness."), CorruptED ("Being naked. All the time.")

!ED ("Just be cool!")

**And the winners are...***The best of the best*

This is the final issue of *mathNEWS* for the term. Thank you to everyone who submitted an article, we loved everything that was given to us (except for your article, Lorenzo von Matterhorn). Without further ado, we will present our favourite submissions for each issue. The winning writers can come on down to mathSOC (MC 3038) and claim their prizes.

For each issue:

1. "UW in the Spring" - Static IP and Impulse Vector
2. "Because I Can" - MeaninglessQuips
3. "Real Time RTS" - The Ant Keeper
4. "The Courses UW Should Offer" - BlueberryMuffin
5. "A survey of assignment and midterm return algorithms" - !BoB
6. "Five Things to Look for in an Effective Wingman" - (define this (not cool))

Thanks again to everyone, and see you all next term!

The Editors

## VPAS Sez

*Lots of things still happening!*

So the term is almost over, but before it's completely done, we have a few more things happening!

If you haven't heard already, Pi Approximation Day is today (22/7 — get it?!). Drop by the third floor later for some free cake and lots of fun!

Our termly General Meeting will be held Tuesday, July 27th at 5:30pm in the Comfy Lounge. All math undergraduate students are invited and encouraged to attend to vote on policy and by-law changes as well as hear what went down this term and what will be going down next term!

24-Hour Games and Movies night will also be held Tuesday, July 27th - Wednesday, July 28th. Games will be in the Comfy and movies will be outside in the DC Quad (bug protection will be provided)! So come celebrate the end of classes and that quiet few days before exams with us!

Congratulations to our new Fall 2011 VP Academics and thanks to everyone who voted! Voting hasn't finished (or started) while I'm writing this, but go to [mathsoc.uwaterloo.ca](http://mathsoc.uwaterloo.ca) to find out who won!

Finally, if you're going to be on campus next term, keep an eye out for director and board applications, which will be coming out soon! They will be posted on [mathsoc.uwaterloo.ca](http://mathsoc.uwaterloo.ca) and we invite everyone to apply!

Feel free to contact me if you have any questions, and good luck on your finals!

Alex Russell

[vpas@mathsoc.uwaterloo.ca](mailto:vpas@mathsoc.uwaterloo.ca)

## FedS Sez

Congratulations to our three brand-new math councillors and thanks to everyone who voted! Head over to the SLC Great Hall at noon today to find out who won!

The next council meeting is Sunday, August 7th at 12:30pm in the SLC Multipurpose Room, and it is the annual budget meeting! As always, we invite everyone to come out. If you would like to see a copy of the proposed budget before the meeting sign up for the council mailing list at [feds.ca](http://feds.ca) or contact us!

Jesse McGinnis & Alex Russell

[mathcouncillors@gmail.com](mailto:mathcouncillors@gmail.com)



## C S C F L A S H

Greetings Algoristas,

Come out tonight for the final CSC Code Party! 7pm in the Comfy. We'll have snacks. And freezes. Considering how hot it's been this week, you'll want some. Unless you haven't left the MC in days, which is possible.

As usual, check out the CSClub homepage for more information, <https://csclub.uwaterloo.ca>

Calum T. Dalek

Chairbeing Extraordinaire

## VPA Sez

*Notes from UAC*

The Undergraduate Affairs Committee (UAC) is a committee chaired by Assoc. Dean Prof. David McKinnon, composed of representatives from programs within the Faculty of Mathematics, VPA of MathSoc, CS Rep from MathSoc, as well as reps from the Registrar's Office, Co-op, etc. The UAC reports to Faculty Council on matters pertaining to undergraduate courses and the Undergraduate Calendar. Arguably the most significant changes introduced earlier this week were for ACTSC, as a result those will be emphasized here. NOTE: All motions discussed in this article are effective 01-SEP-2012 pending Faculty Council and Senate Undergraduate Council approval (unless otherwise indicated).

### *ACTSC plan and course changes*

ENGL 119 will no longer be required for ACTSC students who achieved a "Good" or "Excellent" on their ELPE. Rather, ENGL 119 has been broadened to a list of courses with substantial emphasis on communication. The Math ELPE is currently marked on a pass-fail basis, however, Engineering uses a sliding scale which can easily be adopted. To strengthen the communication skills of students, ACTSC 232 are to include "ELPE passed with Good or Excellent or (Math Faculty Writing skills requirement and ENGL 119)". In addition, MTHEL 131 was approved to be a required ACTSC Major course per explicit suggestions by the UW Advisory Board for Actuarial Science. MTHEL 131 has also been added as a co-requisite for ACTSC 232 in order to derive the most use out of the course\*\*. (\*\*This change is proposed to be effective 01-SEP-2013).

On a separate note, ACTSC 372's prerequisites are to include MATH 237 (or MATH 247). The rationale behind this edition is that there is a sufficient amount of the material in Markowitz theory that requires multivariate calculus. Important to note here is that MATH 207 is not included as a viable prerequisite for ACTSC 372. The department has been tasked with looking into alternative prerequisite chains for students who are otherwise not required to take Calculus 3 for Honours Mathematics (in particular, Mathematical Studies or BCS).

### *other miscellaneous changes*

- CS 246 to be added as optional course for CS Minor students
- COMM 103 course to be created covering ECON 101 & 102 material for Math/CA students only (to bring Math/CA course requirement from 42 to 41)
- MATH 245 to be [Offered: F, S] rather than [Offered: F] due to increased interest (and co-op stream D)

Bryanne Pashley

Vice President, Academics

## Wanted: Stories

If you're a first year, we want to hear from you. Email inspirational, educational, enlightening stories from your first year at UW to [fya@mathsoc.uwaterloo.ca](mailto:fya@mathsoc.uwaterloo.ca). They might be posted on the First Year Affairs website.

Brook Warner Jensen

Director of First Year Affairs



## What do you think?

*Seriously, we want to know*

The current Undergraduate Calendar states that Math students enrolled in a regular program are required to complete 7 full-time academic terms, and students in Co-op are required to complete 8 full-time academic terms (9 if you are in Double-Degree). At Monday's UAC, the following question was asked: What is the academic reason to require students to remain at the University of Waterloo for 7 (or 8, or 9) academic terms [if they have successfully completed all degree requirements within a shorter time-frame]? And, to be honest, there was a lot of scratching of heads going on around the table. There is the concern that a student may load courses on without regard for how this will affect their marks and regret it the following term, but this is easy to mitigate. What if there is some prodigy who comes to UW who completes all required course material in 5 or 6 terms? Exceptional students are currently permitted to request to add beyond 6 courses - some have even grown this number to 8 - so this notion of finishing early is not as far-fetched as one may think. Students may also choose to take part-time terms. However, this constraint of 7 (or 8, or 9) full-time terms risks to require a student to stick around for extra terms after having completed all other degree requirements on a part-time basis. What approach should the Faculty of Mathematics take with regards to students who choose to take multiple part-time terms?

We would like to hear your thoughts on how the Faculty should modify this degree requirement, if at all. This will be an agenda item at the Mathematics Society General Meeting July 26, 2011 at 5:30pm in the MC Comfy Lounge. If you can't make it or want to discuss this further, please email [vpa@mathsoc.uwaterloo.ca](mailto:vpa@mathsoc.uwaterloo.ca). As well, there is an anonymous suggestion box set up at the following url for your convenience: <http://tinyurl.com/UAC-Question>.

Bryanne Pashley  
Vice President - Academics

## 24 Hour Games Night

*Starts July 23rd at Noon in the C&D!*

It is that time of the year again, where people frantically run about worrying about final projects and exams; in this chaotic midst, one term tradition emerges to help relieve the stress of the term's end - 24 Hour Games Night. Due to some entity robbing the rightful booking of the Comfy Lounge under our noses again, the event will start in the C&D on Saturday, July 23rd at noon. When the Lounge's booking expires at 19:00, we will migrate to the Comfy Lounge so we may take advantage of the comfortable couches found in the lounge until the noon of Sunday, when the event officially comes to a close.

As always, snacks and drinks will be provided, and to combat the scorching heat outside, freezies will also be provided to the attendees. Pizza will be provided for the participants who stay overnight to stave off the hunger from staying awake. Even if other engagements prevent commission to the whole 24 hours, showing up to a portion of the night would be much appreciated. Since we have just completed acquisitions for new games, do come to play the new games which we have acquired for the society at whole. Come, show up, and enjoy the night!

Zethar, on behalf of the Games Directors

## Because I Can

*Be Tangent, Not Normal*

This term has been an adventure. This adventure had little or nothing to do with the material that I have put into this column. When evaluating things that happen in my life, I choose to classify them into "Interesting" and "Uninteresting" categories. The result of this is that I can say that I have had a very interesting term, but I am unable to judge whether it was good or not. So, for my own sanity, I declare this to have been an excellent term. I look forward to writing more random stuff next term. Here is a list of things to do that will make your life more interesting! I do not make any claims as to whether they will improve your life or not.

- Write a serious argument for a completely absurd proposition. The arguments must be sensible and logical, but the premises need not be so, for obvious reason. The premises merely must not be obviously contradictory. Bonus points if you start believing your own argument.
- Set up vaguely amusing situations with your associates. Drop hints about interesting stories that you are not allowed to talk about, then when you are directly confronted about it be very noncommittal about everything. Recruiting other friends to help you can result in this becoming even more interesting. The downside is this can cause drama if people start taking you seriously, or poor communication between those involved in the plot.
- Be excessively spontaneous. If you have nothing to do for a weekend, visit somewhere you have never been before. Of course, this only works if you have extra money to spend on going places. These places should be further afield than, say, Toronto. Seriously, who hasn't been to Toronto on short notice? Bonus points if it is more than 300 km away.
- Show up to interesting classes. These do not have to have anything to do with your program, or even your faculty. Especially relevant is that you must not be actually enrolled in these classes. These should be taken for nothing more than interest's sake. Bonus points if you do all the assignments and exams.
- Disappear for a night. In my opinion, this is best done by forsaking electronics for a night. Of course, keeping a turned-off cellphone is a safety precaution, and should be taken. What you can do is to spend a night, either on your own or with some friends, wandering around outside with no electronics. This may result in interesting stories. Bonus points if you stay up the whole night doing this.
- Promise to be a wingman for your bro, and ruthlessly steal every target that he's singled out. Bonus points if it's the same gender.

I feel slightly bad for not having more/better for my final column of the term, but I was too busy thinking about hot, steamy sex. That and the M3 showers. You should check them out. They are excellent.

MeaninglessQuips

## ElseWhen

### *Tales from the Days of Yore*

Back in the first few weeks of January, in 1993, the MFCF issued a warning to students regarding use of the internet. Nothing new there. However, we at *mathNEWS* enjoy a look at the sort of environment students were used to before someone came along and built hulking monstrosities in our frisbee space. We also enjoy the use of the computer labs for such activities as gaming, checking Facebook and Google+, and staying out of the heat.

So how did the students of the early 1990's compare when it came to dire warnings from MFCF? What did they consider to be the pinnacle of computing technology? How did they (ab)use the computer labs of their day? Read on to find out.

## Do You Want to Keep Internet?

### *Keep Reading*

Math Undergrads use a computing environment containing a variety of hardware and software and, through this environment, are part of the global Internet community of millions of users, and over 1,000,000 computers. While the Faculty would like to provide continued access to the Internet, this will only be possible with the continued cooperation of students. Students must be professionally responsible in the use of this technology, and should be aware of current pressures on us all for economic restraint, political awareness, and financial accountability.

In broad terms, acceptable use of this equipment includes any activity consistent with the educational goals of the Faculty. In particular, the Faculty has been able to provide students with general access to the Internet, including news, electronic mail, and file transfer. In large measure, students do in fact use this equipment wisely and responsibly, with the result that the Faculty has been able to take a broad view of acceptable use.

I am concerned that the actions of a few individuals may jeopardize the computing environment. Let me illustrate some of my concerns as objectively as I can by submitting the following observations.

### *Don't Mess Around with Security*

- Some students have exploited security holes in MFCF software to insult others on behalf of innocent third parties and, in some cases, to invade the privacy of others.

Abuses of computing resources are regularly reported by MFCF to the Associate Dean, Undergraduate Studies; in serious cases disciplinary action will be taken in the same way as for academic offenses. In extreme instances, these actions constitute criminal offenses.

### *Don't Display or Print Offensive Pictures*

- MFCF provides students with high-quality bit-mapped graphics terminals. Students acquire and display background images on these terminals which others consider offensive. These images are generally visible in public terminals rooms and make for an uncomfortable environment for some other students. Similarly, MFCF provides students with 100 free

pages of high-quality laser-printer output per term. Some students print images on these printers which are not related to academic work, and which many would consider offensive

- Recently, the RCMP investigated allegations that pornography was being distributed electronically through news groups at the University of Manitoba.

Without making any comment on the images themselves, it is clear that such activities are unethical, insensitive, and an unacceptable use of resources. It is the responsibility of all of us to see that such behaviour is stopped.

### *Don't Use Resources Frivolously*

- MFCF connects the undergrad subnet to the worldwide Internet, and provides students free access to off-campus news, electronic mail, and other informations available via ftp and gopher. Students have created software on MFCF undergraduates equipment which makes games, (and hence MFCF computing resources) accessible from off campus.
- The Internet link between Waterloo and Toronto (and hence the rest of the Internet) is a single 56-Kb/s line, and is arguably the scarcest computing resource on campus. Recently, when monitoring has been performed on the Internet link, Math undergrads have been a prominent and identifiable group of users. This fact is known at the level of the University Computing Committee.

It takes very little reflection to realize that trivial incidents can explode if attention is drawn to them: Math undergrads should be aware that they must bring the same high degree of professional responsibility to their use of computing resources as is expected of all other members of UW. Their actions can affect not only their own reputations, but those of the Faculty, and University. Their actions can also have significant positive or negative effects on the future evolution of the computing environment within the Faculty, and around the University.

## So there you have it

It looks like MFCF announcements haven't really changed all that much over the years. Looking at the article, there are only a few clues that this was written before the incoming frosh were born.

Sitting here in the office listening to streaming music, watching videos on YouTube, and occasionally working, it's hard to imagine all of campus on one 56 Kb/s line. It's also hard to imagine the *mathNEWS* office without the hot muffin sex background on the computer. And to think they were concerned about offensive pictures back then.

There are other things as well, such as the mentions of gopher, the way they consistently capitalize words, (as an editor, I can assure you this doesn't happen anymore) and their touting offerings of "high-quality bit-mapped graphics terminals" and "news, electronic mail, and file transfer". The estimate of "over 1,000,000 computers" for the size of the internet, while still technically true, is also a bit of a clue.

On the other hand, 100 free printed pages per term does sound nice.

# Interesting Math

## Polynomials and Complexity

Polynomials make up a fundamental building block of mathematics. Their study has produced a rich theory through the years, with much written about when they have integer solutions, when they have solutions by radicals, and entire branches of mathematics built on top of the geometry of their zero sets. One celebrated theorem in this area is David Hilbert's Nullstellensatz (German for zero set theorem). In a weak form, suppose we have a field  $F$  and a set of polynomials  $f_i$  in several variables over this field. Hilbert then tells us that these polynomials do not have a common zero if and only if there exist polynomials  $g_i$  such that

$$\sum_{i=1}^n g_i f_i = 1$$

The proof is somewhat involved and not our topic today. If you are interested in it there are many expositions to be found, and it forms a fundamental tool in algebraic geometry. There is a problem with the Nullstellensatz though. It is non-constructive, it does not tell us how to *find* those  $g_i$  in an algorithmic fashion, and it is non-obvious from the statement or proof that this should be possible to compute at all. Our skepticism about whether or not it is possible to compute the solution comes from the negative answer to Hilbert's tenth problem: there is no algorithm to decide whether or not a polynomial with integer coefficients has an integer solution. This result, the combined work of Davis, Matiyasevich, Putnam, and Robinson, suggests that lurking in polynomials is a mess of computational complexity.

The Nullstellensatz is more tractable than Hilbert's tenth problem, it has been shown that there is a procedure to decide if a set of polynomials has a common zero, however the best known algorithms take exponentially many steps. In computer science, the decidability of a computational problem is usually not very interesting. We also require efficiency, solving a problem in a feasible amount of time. It is generally agreed that algorithms that take an amount of time polynomial in their input size are efficient, ones that we can actually implement on a computer. In the case of our Nullstellensatz program the input size would be the number of terms times how many bits it takes to represent a term (the degree of each variable, and the coefficient). The careful reader (or seasoned computer scientist) will object that we cannot represent all complex numbers in bits. To avoid this difficulty we will restrict our attention to  $\mathbf{Z}/2\mathbf{Z}$ , the finite field of order two, and its algebraic closure (every time a polynomial does not have a root, add a new number, like  $i$  in the case of the real numbers and  $x^2+1$ ). So, we ask is there a polynomial time algorithm to decide if a set of polynomials over  $\mathbf{Z}/2\mathbf{Z}$  has a common zero.

The answer is an open question, and you might have heard of it. Such an algorithm exists if and only if  $P=NP$ . For those not in the know,  $P \neq NP$  is one of the central questions in complexity theory. Informally it asks if an easily verified problem is also easily to solve. Formally,  $P$  is the set of computational yes/no questions that can be answered in an amount of time polynomial in the input size.  $NP$  is the set of computational yes/no questions that we can, when given a solution to the problem, check the solution in time polynomial in the input size. The set  $NP$  has been characterized by so-called  $NP$ -complete problems; an  $NP$ -

complete problem has the property that any other problem in  $NP$  can be converted to it in polynomial time. Steve Cook showed that the problem of deciding if a boolean formula is satisfiable is  $NP$ -complete. If we note that in  $\mathbf{Z}/2\mathbf{Z}$  multiplication behaves like 'and' and addition like 'xor', it becomes clear that if we can find common zeroes in sets of  $\mathbf{Z}/2\mathbf{Z}$  polynomials we can find solutions of boolean formulas, so our Nullstellensatz is at least as hard as an  $NP$ -complete problem. Evaluating a polynomial in  $\mathbf{Z}/2\mathbf{Z}$  can be done efficiently (the maximum number of multiplications per term times the number of terms is polynomial in the degree and the number of terms). Hence deciding the Nullstellensatz is  $NP$ -complete.

The past century of mathematics has been filled with many fascinating existence results; many are proven in a non-constructive fashion. With the rise of computer science, the computability (is there an algorithm to find solutions) and complexity (is such an algorithm efficient) of mathematical structures is now being considered. The Nullstellensatz is one such area, and this discussion was inspired by Steve Smale's article "Mathematical problems for the next century" which presents computational considerations as one of the likely driving themes in the next century of mathematics. Topology is also being enlivened with algorithmic considerations. Poincare's conjecture (recently proven) can be stated informally as "if it looks like a sphere it is a sphere", but the complexity of figuring out whether or not something looks like a 3-sphere is  $NP$ -hard (you can reduce other problems in  $NP$  to it) but it is not known if it lies in  $NP$  or not.

**Problem of the Issue:** (from *Mathematics Made Difficult by Linderholm*) A farmer acquires an algebraically closed field by extending his field finitely. What can be said about the original field?

Edgar A. Bering IV  
ebering@uwaterloo.ca

## This Week's Grid Answers:

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

## N Reasons to Despise Essays

*Waldo + Essays = STRESSFUL TIMES AHEAD*

- They can be VERY intimidating and frustrating (especially if they're for an upper-year-level course)
- They can take FOREVER to write (especially when you suffer from writer's block and you're limited to a public computer due to your laptop's power cord not working properly)
- THEY INVOLVE NO MATH WHATSOEVER (you may find yourself relieved when you need to take a break to do a math assignment)
- They often involve the need for filler to fit the given page limit (*mathNEWS* editors can certainly agree with me on this one)
- They can accumulate up to 60% of your grade
- The topics seem repetitive (even though you already wrote one essay on a particular topic, you often find yourself writing about ALMOST THE EXACT SAME TOPIC when you have to write another one)
- Even if you finish one, there always seem to be more that you need to complete

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## Obsession

*A Quick Checklist to Know When You're Going Too Far*

Perhaps you may have noticed restricted, repetitive patterns of behavior, interests, or activities in yourself or one of your acquaintances. Are you going too far?

- Holding a detailed-colour model of the object of your obsession in your hands and stroking it softly
- Rigid adherence to routines to maximize the amount of time you get to spend with your obsessions
- Thinking about your obsessions all day and all night
- Asking everyone you know about your obsessions and nothing else
- Turning every conversation into a conversation about your obsession
- Asking for an obsession-themed birthday cake
- Dressing up as your obsession for Hallowe'en
- Writing about your obsession for *mathNEWS*
- Creating a fan club for people who share your obsession
- Staring at your obsession all day
- Spending more time with your obsession than with your family

lable

## You know what?

*I quit!*

You heard me. I'm done. I've been in 2A since I became an Editor. I want to graduate eventually. So I shall retire. Those other editors can do all the work. It was fun folks.

RetirED (formerly CorruptED)

## Chinese Food

*Regaling you with stories from beyond the beyond*

After this term, I have discovered that most practical problems in computer science can be solved with one of three things: an added layer of indirection, model-view-controller, or swarms of stuff. I would like to explore the latter.

Whether it be ants, birds, or bees, swarms of things have had their place in bravely attempting to solve NP-hard and NP-complete problems by converging upon and attacking the programmer until they finally make up funny looking graphs to explain exactly why the ants, bees, and birds are no longer their friends.

Speaking of friends, I need some. My old ones broke. I will be accepting applications Monday afternoon.

Speaking of birds and bees, when a man loves a woman...

But on a serious note, why isn't swarm intelligence more actively explored earlier in computer science, or just concurrent control flow in general? Who ever said that first-years should not be exposed to the complexities of exception throwing across distinct threads, or the beautiful mystery that is multi-level exit?

Impulse Vector

## The M3 Showers

*Pay Attention, CS Students*

As part of the new math building, there are showers in the bathrooms on the fourth floor. I do not know why these are only on the fourth floor, but they are. Upon entering the shower, the first thing that I noticed was that they were very large. There is enough room for a veritable orgy in the shower without being visible from outside. Being heard is an entirely different matter, however. There is more than enough room for everyone to take off all their clothes and leave them in such a way that they will not get wet.

In addition to being spacious, the showers are also well equipped. The shower heads are detachable and adjustable, the water temperature is easy to control, and there is a seat. A downside is that, at the time of my shower, the water pressure was not very good. The massage setting on the shower head did not have enough pressure to feel nice. I was also disappointed by the flow rate on the other settings. On the other hand, I suspect that the water was softened, as it did not rinse off soap very well. If you plan to use these showers for cleaning yourself off, instead of their myriad other uses, it is recommended that you bring your own soap. The only soap in the showers is bathroom hand soap, which is ineffective for washing yourself off.

One of the main issues with the showers is the lack of available towels. These can be taken out of PAC, but this necessitates traveling outside and exposing oneself to the daystar. So, one must bring enough towels for everyone taking the shower. This is rather inconvenient, and your trusty reviewer neglected to do so. Thankfully, the pathway between M3 and MC is generally warm, so wearing a minimal of clothing and spending time in this tunnel can dry you off quite nicely. It helps to have no shame.

In conclusion, ZOMG M3 SHOWERS ARE SO GREAT!!!11. Just make sure to bring your own soap and towel. Alternatively, be shameless. Shamelessness often helps.

MeaninglessQuips



## Orange News

*Be Orange, Bitches*

Hello, and welcome to our final edition of Orange News for the Spring 2011 term. In a monumental event, the Orange News Editorial Team has decided to make the unprecedented move of introducing, for the first time ever, two top stories.

Our top story tonight: it's pretty damn hot. That's right, Statistics Canada, the Weather Network, Waterloo's Weather Station experts, and Weird Al have all reached the same conclusion that it's pretty damn hot. Temperatures are very high, the humidity index as well, there's very little wind-factor, and overall it's been freakin' scorching for the past few days.

Other things that are hot include soup, the sun, the Human Torch, a desert (but not a dessert), a stove, and me, your faithful reporter Orange Crush, who has been voted "hottest *mathNEWS* reporter" in a survey that nobody but me knew about.

Waterloo students are doing their utmost to combat the fact that it's pretty damn hot, each according to their faculty. Environmental Studies students have written a letter to the sun asking it to turn it down a bit, but reports indicate that the letter was probably incinerated before the sun could read it, sadly. Science students have tried using dry ice to cool off, but all it did was create awesome fog, and then it was gone. AHS students learned that the best way to keep their body cool is to reduce their level of activity, and thus they all became couch potatoes. Art students all went to the beach and were arrested for unruly behaviour. The engineers tried to engineer a device to cool themselves off, but GM sued them for ripping off their design for an air-conditioner, so the engineers resorted to drinking more beer instead. Even Laurier students responded to the heat by wearing even shorter pants, just when you thought it was impossible.

Math students, however, are simply too busy with assignments, projects, quizzes, presentations, and other actual work to do anything about the heat. MC2066 has never smelled worse. Honestly.

So there you have it, it's pretty damn hot. And that's it for our top story tonight.

Our other top story tonight is that, according to rumours, nobody likes me, Orange Crush. This comes as a surprise considering the fact that last term O.C. has been voted as "most beloved person on campus" in a survey nobody knew about. On the other hand, innocent UW students have consistently been trying to avoid talking to me this term. Also, nobody ever emailed me this term even though I posted my email on like every article. Thanks a lot people. The conflicting evidence needed to be sorted out in order to reduce dissonance and bring to readers a conclusive answer once and for all.

Under personal risk, the Orange News Editorial Team went out to investigate what the real students of the UW Math faculty think about Orange Crush.

Nick said, "Yeah, that Orange Crush". He didn't elaborate further.

Marc said, "Orange Crush? Best articles in *mathNEWS*. But I'm not sure that's really saying much". The mHS (*mathNEWS* Hit-Squad) has been dispatched to deal with Marc.

Aaron said, "Who is this Orange Crush? I drink Cream Soda".

Tai said, "Yeah, I hear he writes for *mathNEWS* and nobody likes him".

Anne said "Orange Crush is dumb, and not funny at all. Wait, aren't you Orange Crush?"

Lan said "I can't actually say I hate him, that's so mean, I can't do that".

A pure math prof said "I don't really read Orange Crush's articles, they're too long".

A stats prof said "Please hand in the assignment at the end of class".

A *mathNEWS* editor said "Orange Crush is a menace! Get me some pictures!"

Orange Crush said "Orange Crush is the worst person alive. Really, just a despicable, awful person. We should kill him."

So there you have it, actual quotes describing what people really think about Orange Crush. I honestly have no idea what sort of conclusions can be drawn from these. So in conclusion, you know, something and stuff. If you want your opinion about Orange Crush to be heard, make sure to contact the Orange News Editorial Team at [orange.crush.uw@gmail.com](mailto:orange.crush.uw@gmail.com). If you don't want your opinion about Orange Crush to be heard, then shut the hell up. It's pretty damn hot outside, and I don't need your crap right now.

Orange Crush is signing off for the term, but you can look for him to continue his fan-favourite columns next term, exclusively on *mathNEWS*. Until then, good luck on exams, enjoy your summer, don't forget to give me that \$20 you owe me next time you see me, good night, and good freakin' news.

Orange Crush

## 5 Things to Look For in an Effective Wingman

Greetings fellow mathies. I was requested to write this on behalf of one of the *mathNEWS* editors. It may or may not relate to the failed performance of a certain fellow writer over the past weekend. The use of the word "wingman" is not meant to be gender exclusive; the word "wingperson" just sounds weird.

1. Someone who is, or can make themselves appear to be, less attractive than you. You don't want the person you're trying to pick up being more interested in them, that's just awkward.
2. Someone who's either already taken, not interested in anything, not interested in the same kind of people as you, or someone so committed to the cause of getting you a partner/a connection/laid that they won't risk picking up the person you're trying to connect with.
3. Social competence! An awkward wingman just makes you look even more awkward.
4. Someone who will get less drunk than you. How else can you make sure they have your best interests in heart?
5. An exception to rule 2: The perfect wingman is someone you're already having sex with. That way, even if you fail, you don't have to go home alone.

(define this (not cool))



## Braiiins

*Full of carbs*

So I stop by in Waterloo to do Orientation Leader Training, but when I get here on (last) monday, I'm informed that there is a game about to go down (it had actually just started but whatever) called Humans vs Zombies.

Rules can be found online at [hvzsource.com](http://hvzsource.com), but basically humans wear a bandana or similar cloth around their upper arm and zombies wear the same, but around their head. Humans must outrun and outlast the zombies (or stun them with socks or nerf guns), while zombies must tag human players to feed themselves (zombies who don't feed die after two days). If all humans are zombified then the zombies win, but if all zombies starve then the humans win. Also, buildings and events are no-play zones for safety reasons.

Being an average zombie lover I threw myself at the opportunity to play. Thus started my three days bottled in the MathSoc office with fellow players, going out only for food, and meeting friends, or doing my OLT. Oh and I went along on a zombie hunt when there were still only two zombies. We got the target, but he gave us some scary info: that there were three other zombies that were recently caught. Cue another day of hiding in fear.

But as I exited my final OLT session on Thursday afternoon, a leader from the session taps my on the shoulder and says "Hey". I turn to him and say "Huh?". He responds with "You're now a zombie". I was shocked, but as the original zombie he didn't have to wear any bandana, so a zombie I became.

And so the fun began!

What was a game of hiding and going out in numbers to confront individual zombies who were uninformed of human hide-outs became a game of stalking friends between classes and scaring them silly. On the way out of MC I passed a human player from MathSoc, but the original zombie got him, and so marked the death of MathSoc. Another MathSoc human spotted this, reported it and proceeded to flee to his home off-campus for the day.

About an hour and a half later, I got a message from one of the MathSoc humans inviting me to go on a zombie hunt. I knew they were trying to hunt me, or atleast see if I was a zombie. So I went to their rendezvous, but from a rear entrance and with wary eyes. I was very lucky, for I caught one right inside the entrance who was taking a drink of water. His partner was hiding at the top of a stairwell, overlooking the lobby of the building, I tried but failed to get him since socks in close quarters are hard to dodge.

The night was then filled with tracking down that one human that got away. And after he received reinforcements and locked himself in a fellow human's V1 room, we were off to hunt others.

The next day was spent stalking major traffic areas on campus, as well as trying to keep track of humans who went through buildings, not to mention the mission which got about a dozen humans out of hiding to escort the game admin across campus to his res with zombies (in theory) shadowing and waylaying the group. Being a Zombie is massively fun, compared to being a human who must hide or travel in large groups for safety, zombies get to prowl without fear and can work well in small groups of two or three to take down even the most prepared of humans.

There were small problems with the game, some rules weren't followed, non-players got involved (a big no-no), but all in all my time, although cut short, gave me two kills in my three days of being a zombie (had to go back home). I would suggest anyone who is looking for a game like this to partake, the game is currently closed to new players (if it isn't over by the time you read this), but another game is in the works for september, which should have a much larger amount of players than the little 37 player game that was this one (from what I am hearing, it could include two hundred players!?).

Check out [www.hvzsource.com](http://www.hvzsource.com) for the status of the current game, rules, and (hopefully?) info on september's game.

Soviet Canadian

## What I Did Instead of Hobknobbing With Politicians

So on Tuesday (today for me), a bunch of politicians came to campus. *mathNEWS* was invited to attend. We didn't however, despite ConED's wishing to stalk the young Trudeau. I had other things to do, like sleeping in, talking to a self-proclaimed Polack, and getting cut by broken glass, getting a haircut, buying the autobiography of Mark Twain and the score for Avenue Q. Much better than listening to jerks spout on about policy.

GroovyED

## profQUOTES

For those who aren't here, you can pick these up in my office hour  
Broadbent, MATH 239

So, in this case, should we use range trees or kd-trees? We should use kraft dinner trees.

Storjohann, CS 240

Hobo? Are we allowed to say that? Is it politically correct? Let's say Frank is an arts graduate.

Forrest, PHYS 263

I did my PhD in this stuff. Then I discovered it had no applications so I switched into computer science.

Ben-David, CS 245

Next Friday-That'd make a good song!

Wang, MATH 213

Sometimes it takes guts. You gotta stick your neck out. Your neck may get chopped off. You may look silly. But you were right. Good for you. Even if you ruined the last lecture.

Wang, MATH 213

We could call it pink dalmation, but conditionally convergent makes more sense.

Subich, MATH 138

We're going to go back to grade 2 and guess and check.

Subich, MATH 138

This is greek letter "add this stuff up".

Subich, MATH 138

## In Other News

*Beating Imprint in their own game since May*

In *UW mathNEWS*, the term is ending. Everybody's really very happy. Students, TAs and profs alike are excited about the fact that lectures are pretty much over, and they have a little free time until exams. Since it's the spring term there are lots of end-of-term parties going on and stuff. I have not been invited to any.

In serious UW news, on Thursday of last week two people were arrested after an argument at the SLC escalated to the point where one of them drew out a BB air pistol. Seriously. The police intervened before anyone was injured. Anyone want to bet that these guys were engineers?

In regional news, last Sunday was car-free Sunday at KW, held at the same time as the Uptown Waterloo Jazz Festival and Ribfest. It's not clear whether the idea was to reinforce the message of don't drink/eat ribs/listen to jazz and drive. Either way, with the situation of construction in the area, a pedestrian-only King Street seems like total overkill.

In national news, ridiculously high temperatures have caused Northern Ontario forests to fall victim to over 85 fires last week-end. Many people were forced to evacuate their homes. Al Gore and experts from the UW Environmental Studies faculty commented "Didn't we warn you? Global warming's a bitch."

In international news, earlier this month, following some sort of phone hacking scandal that's still ongoing (like the head of Scotland Yard resigned and somebody's body was found and that sort of mess), the British tabloid *News of the World* has ceased publication. The tabloid was well-known for publishing such sensational news as pieces about Prince Harry getting drunk. The collapse of the famous tabloid leads many to lament that print is dead. But hey, In Other News is still going strong, so you know, whatever.

In entertainment news, Harry Potter and the Deathly Hollows breaks all sorts of records at the box office. It also happens to be an awesome movie. Muggles the world over are mourning the end of the series, and are checking their mailboxes even more frequently for that admission letter from Hogwarts. I know I am, anyway.

In sports news, Japan wins the Women's Football (aka soccer) World Cup after beating the United States 3-1 in penalty shots following a 2-2 tie. There, I reported on a women's sports title without any insinuations. Now will you women stop calling me a chauvinistic pig because of last column's tennis porn joke?

In technology news, Google+ has launched. Now, I know this happened a while ago so technically it's not news, but I only found about it recently- ironically enough, because I don't have Facebook, so I never got an invite (also I have no friends, so I got no invite). Which kind of calls to question the whole concept of launching a Facebook competitor that relies on FB to actually launch. Maybe Google should've asked RIM for advice on launching new products. Ha ha ha.

In other news, I somehow managed to catch a cold. After it's been 30 degrees out for the past week. I feel like total crap. Also, I'm sick. The Orange News Editorial Team would like to advise readers to drink their orange juice, take their vitamins, and not get sick during the last week of the term when all your assignments and projects are due.

And that's all for the final Other News of the term. We'll be back next term with other news. Until then, feel free to read *Imprint* or *News of the World* or something. Just not the Star. Anyway, the Orange News Team wishes everyone good luck on exams, have a safe summer vacation, good night, and good news.

Orange Crush

## Hot Steamy Sex

*Ideas from Club Ren*

In search of an interesting life, I decided to go to Ren with one of my friends this weekend (the writer of Rainbow Mathies, in fact). During this adventure, at some point there was a comment regarding hot, steamy sex. However, given that it is currently summer, steamy sex is considerably more difficult than at other points in the year. The temperature and humidity rules out the possibility that the steam could simply be generated by evaporating sweat. So, with this in mind, I searched for alternative ways of generating steam. 'Cause, you know, there is nothing better than hot, steamy sex.

The first idea that I hit upon was shower sex. Provided the water is hot enough, this generates nice clouds of steam. Advantages to this method include that it is water steam, and adds some extra heat. Disadvantages are that to get good steam, the water must be too hot to be comfortable, and having sex in the shower greatly restricts mobility. Finally, shower sex is not particularly sanitary.

The second idea was to render the atmosphere cold/dry enough to allow bodies to generate their own steam. This requires dehydrating and cooling down the atmosphere, which suggests the use of a walk-in fridge or freezer. The only advantage to this is

there will be nice clouds of steam when bodies get hot. The disadvantages are that it is cold. Excessively cold. Cold enough to be uncomfortable. You do not want to have sex in a walk-in fridge.

If adding extra heat or reducing the heat of the environment does not work, it falls to artificially creating the "steam." The easiest way to do this is using blocks of dry ice. This gives a nice steamy atmosphere. Unfortunately, it cools down the surrounding area to the point that it begins to be uncomfortable. Then, there is the slight problem of the fact that dry ice is carbon dioxide. The net effect of this is that carbon dioxide inhalation will cause all parties to fall asleep. And potentially die of asphyxiation. Dry ice is a bad idea.

The final option is artificially creating steam in such a way to avoid reducing temperature and asphyxiation. The optimal solution to this is using theatrical smoke generators. These safely generate a reasonable approximation of steam while being non-toxic. The only disadvantage to this is that this setup is expensive and a bit noisy. This is the best option. If you must have steamy sex in the summer, this is the way to do it while maintaining the most comfort.

MeaninglessQuips

## What is normal?

*Baby don't hurt me, no more*

A friend wanted me to define "normal" by Math standards. I thought it was definitely an interesting topic to research into, so I dug up some "basic" information about the ordinary everyday Math student. Given that the general majority of them are male and in Computer Science (and given that I am of that demographic), I am going to first point out some basic observations about "Math".

1. We all love or know something about Pokemon.
2. We all love or have something to do with gaming.
3. We consider ourselves nerdy and proud.
4. Most times we can be found huddled up at some table, furiously scribbling proofs or formulae, in an attempt to make a small grain of sense in a world full of chaos (AKA Statistics).

And so, I give you the "normal" measure of a Mathie! (Please don't judge yourself to this - it was a general outline given the fact that my friend is female and basically has been hit on by every creeper in Math)

Normal by Math standards:

1. Been rejected by a member of the opposite sex at least once since you got to Waterloo.
2. Unable to hold a decent conversation for longer than thirty seconds without a mention of booze, partying, gaming, or other Internet meme.
3. Able to burst into song at any point in time about anything remotely related to the topic.
4. Instantly locks up and become immobile and unresponsive upon a beautiful person of the opposite gender walking into the room.
5. Can't look at an unsolved Math equation for longer than five minutes without somehow working out details of it.

Feel free to add to my "basic outline" of normality, but these are based on a lot of previous observations people have made to me (that I forgot to include because of laziness).

Rationally yours,  
Pichaku

## Top 10 Things Engineers Should Never Do

*Engineers helped me write this*

1. Have children.
2. Write for *mathNEWS*.
3. Get a social life.
4. Take a Pure Math course.
5. Go to spaaaaaace!
6. Attempt to woo a girl in Math.
7. Run around with waterguns.
8. Troll people.
9. Fail Physics.
10. Be sober.

BlueberryMuffin

## A Review of the Apple UI

*And bras*

I'm not a Mac user. I don't really care for shiny reflective buttons on a UI, so long as I have a convenient and intuitive way of doing the actions I want to perform. However, sitting here in the Mac lab, I notice some features that I'm not really fond of.

First of all, the placement of the buttons. No, not the window management ones. I don't like those either, but that's because I'm not used to them, not because I consider them bad design. I'm talking about the ones on the back of the screen. If I want to hit the power button, or plug in a set of headphones, or a USB cable, I have to stand up and lean awkwardly over to see what I'm doing. It's been pointed out to me that the same problem applies to removing bras. However, bras one can undo by feel. Unfortunately, the designer of the Mac I'm currently using has neglected to take into account that I can't read the icons with my fingers.

The next issue I've got is that when I click the close button on an application, I want it to go away. "But Concealed" the Mac users cry "You'll have to wait while it loads the next time!". Oh no, all of a few seconds of my time. I like applications to leave entirely when I'm not using them. That means not hidden, not in RAM, and not swapped out to disk. I enjoy having control over my programs. That means deciding when they should go away. Making this hard for me isn't a good way to handle the fact that "I won't do this very often". It's like welding bras shut just because I'm in software engineering and won't be taking them off very often.

A further issue I have found with the Mac I'm using is the lack of user notification. For example, if I've decided to close Firefox, and then log out, it blocks the logout because Firefox has asked me whether I want to close my tabs. The problem, however, is that instead of telling me what the problem is once it detects it, it wait up to a minute before doing so. In that time, it won't let me use the rest of the UI. It's like having a bra clip that appears to have caught, then detaches itself later, causing annoyance and possible public awkwardness.

Concealed

## *dissed*CONNECTIONS

Wanted: The last 3 months of my life back. May be vacationing in Bermuda along with my innocence, sanity, hopes, and dreams. If found please return to !ED.

Sublet wanted: A pretty location, just off of the coast of Greece. Beautiful views, able to see seaweed for miles. Underwater. 2 minute ascent to bus stop. Bus does not go to UW.

Found: Fleshy mass on the floor near the MC. Appears to be a broken heart. Will mend for a hug. To claim call 226-218-3107.

Wanted: Assistant to help in a professional work environment. Duties include cleaning the lab, fetching necessary supplies, defiling graves when parts are running low, and sewing body parts together. Ask for Dr. Fronkensteen at the reception.





## The Transitive Kernel Who Never Squared Pi

The field was in darkness.  
 The groups were in place.  
 Our ideals were prime  
 As we stared into space.  
 And above us, our captain,  
 He stood like a king.  
 But to us he was just  
 A Euclidean Ring.  
 Now don't get me wrong,  
 I respected that Ring  
 'Cause he knew his domain  
 Was an integral thing.  
 But our Ring was not perfect,  
 And quite a far cry  
 From the Transitive Kernel  
 Who never squared pi.  
 The sets they were ready,  
 And well ordered too.  
 Their union was strong,  
 Though their subsets were few.  
 Cantor, their leader,  
 Was indexed and null,  
 Transfinite and bounded,  
 And exceedingly dull.  
 Despite his equivalence,  
 My respect he commanded;  
 He was cardinal, countable  
 And not underhanded.  
 But his continuum powers  
 Could not begin to compare  
 To the Transitive Kernel's,  
 For no pi did he square.  
 All tense were the conics,  
 With their foci unnerved.  
 Their tangents unstraightened  
 And their ellipses uncurved.  
 There was also a leader,  
 Directrix his name,  
 So tangent, so normal,  
 You'd swear him insane!  
 But he did have experience,  
 And could asymptote fine;  
 Let's face it, can you  
 Draw an infinite line?  
 But drawing such lines  
 The Kernel could do,  
 And also, he never  
 Raised pi to the two.  
 The statistics were calm  
 And their mode was apparent.  
 They were highly significant  
 And greatly invariant.  
 Their head man, a t. Student,  
 Was a mean derivation,  
 A dimensionless moment  
 In my estimation.  
 However, in fairness,  
 He was a linear guy,  
 95% confident  
 and square tested by chi.

However, this man,  
 Though square tested by chi,  
 Was not like the Kernel  
 Who refused to square pi.  
 There were matrices there  
 (Just to cover our flanks).  
 They had elements, adjoints,  
 And a number of ranks.  
 They were led by Hermitian,  
 A conjugate fool,  
 Who conformed to addition  
 And broke Cramer's rule.  
 Yet he was a determinant,  
 And unusually singular.  
 He was symmetric and transpose,  
 And upper triangular.  
 But this man was no Kernel,  
 At least that I reckoned,  
 For the Transitive Kernel  
 Ne'er put pi to the second.  
 The vectors slept waiting,  
 Dead to the world,  
 With gradient, divergence  
 Cross-product and curl.  
 Their commander, Laplacian,  
 A unit del dot,  
 Was seen as a vector  
 Whose brain went to rot.  
 Nonetheless, he was scalar,  
 And quite sturdy too,  
 And incredibly healthy,  
 And quite well-to-do.  
 But the Kernel was better,  
 Both in health and in wealth,  
 And never did he  
 Multiply pi by itself.  
 The differential equations,  
 Their solutions were general,  
 Were partial, exact;  
 Their exactness, incredible.  
 Their kernel, Runge-Kutte,  
 (His type now defunct)  
 Was ordinary, initial,  
 And usually drunk.  
 Nevertheless, he was brave,  
 Homogeneous, exact,  
 An outstanding leader  
 No courage he lacked.  
 But he was not like the Kernel,  
 Who never did try,  
 To compute or to find  
 The second power of pi.  
 The compact topologies,  
 A latticy crew,  
 They were coarse and cofinite  
 And metrizable too.  
 They followed an officer -  
 Hausdorff, I think -  
 Who was dense and adherent;  
 A regular fink!

Notwithstanding, this man  
 Was a bit homotopic,  
 Bicompat and open,  
 A man pseudometric.  
 But compared to the Kernel,  
 His strong points were few;  
 The Kernel, he never  
 Placed pi with a two.  
 There were differences, sums,  
 Trochoids and cycloids,  
 Quartics and quintics  
 Plus obliterated spheroids.  
 They had eminent leaders,  
 Like Fresnel and Catalan,  
 Minkowski, Laguerre,  
 Green and Jacobian.  
 And all of these leaders  
 Had greatness within  
 But the greatness alone  
 Did not mean we would win.  
 We knew we would win, though,  
 And none of us die,  
 We had the Transitive Kernel  
 Who never squared pi.  
 A burning orange spheroid  
 Distantly rose.  
 We were in residue classes,  
 Our perimeter closed.  
 Our spirals were ready;  
 Our bases, orthogonal,  
 And our complex inversion  
 Was beta hexagonal.  
 The men, they were ready,  
 The leaders were too,  
 But none of them knew  
 Just what they should do.  
 Oh, where was the Kernel?  
 We needed Him so,  
 And in just a few moments  
 We'd be fighting His foe.  
 I was sent to go fetch Him,  
 That continuous slope,  
 That dual choice function  
 In whom rested our hope.  
 I translated myself,  
 Off the field to the woods.  
 An explosion then cubed me  
 Right there where I stood.  
 Swiftly I spiralled  
 And was thrown to the floor  
 When that gamma explosion  
 Was followed by more.  
 They were under attack,  
 My men over there,  
 But where was the Kernel  
 Who pi never squared?  
 They fired their antilogos  
 (As I Leibnitized in shame)  
 But without the Kernel  
 Didn't know where to aim.

They reflexed and injected,  
 But all was improper,  
 The men were misled  
 As they fell in the slaughter.  
 The leaders were osculating,  
 As their men dropped like phis.  
 But soon they too fell,  
 Those great leadership guys.  
 Then the field lay in silence,  
 The men lay there dead.  
 I stood there a moment,  
 Then went on ahead.  
 I Stoked through the forest  
 Complementing my way,  
 Trichotomized visions  
 Of the dead of that day.  
 I looked up ahead,  
 Made a lemniscate sound,  
 For the tent of the Kernel  
 I had finally found.  
 What happened, I asked,  
 Approaching with null,  
 Was he captured and tortured  
 Then shot through the skull?  
 Why did he leave,  
 Leave us to die,  
 This transitive man  
 Who never squared pi?  
 I went through the tent flap,  
 His back facing me,  
 He was working at something  
 Which I couldn't see.  
 Not dead, not partitioned,  
 What was it this Guy  
 Was doing while he  
 Had let everyone die?  
 I looked at his paper  
 (As I shivered with fear)  
 Number and figures,  
 Their meaning was clear.  
 I stared at this man-god,  
 And thought of the dead.  
 Then I took out my slide rule  
 And sliced off his head.  
 Why did I kill him,  
 This great Number One?  
 Quite simply, I killed him  
 For what he had done!  
 Coefficiently he  
 Had permuted a prime,  
 In other words, committed  
 A terrible crime.  
 He was guilty of mapping  
 In modulo three,  
 A crime that in lawbooks  
 You never will see.  
 For the Transitive Kernel,  
 Who left us to die,  
 Was only computing  
 The third power of pi.

# gridCOMMENTS

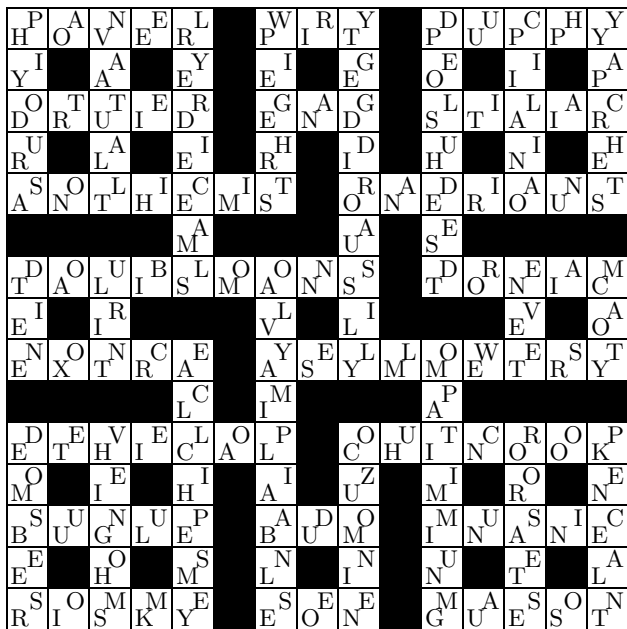
*The end of a term! O, discordia!*

Hello all, and welcome to the term's final *gridWORD*. I received no submissions to the Quick Clues last issue, so no winner will be declared. The Cryptic Clues were won by Graham Pinhey with the only completely correct submission (although I received another submission with only two letters wrong). Last issue's *gridQUESTION* was "How is a metric space like a platypus?", and Graham's answer was "Both follow in the wake of the Great Old Ones". Graham, your prize may be collected in the MathSoc Office on the third floor of the MC.

As this is the final issue of the term, no prizes will be awarded, since the answers to the grid are printed in this issue. You are honour-bound to complete the grid before you peek. Anyway, good luck to all of you. Farewell!

-perki

## Last Week's Grid Answers:



Down

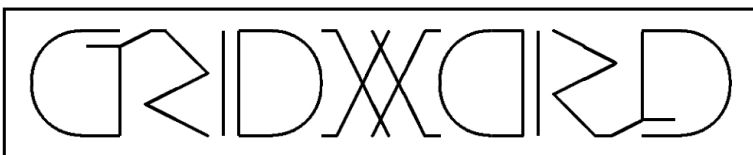
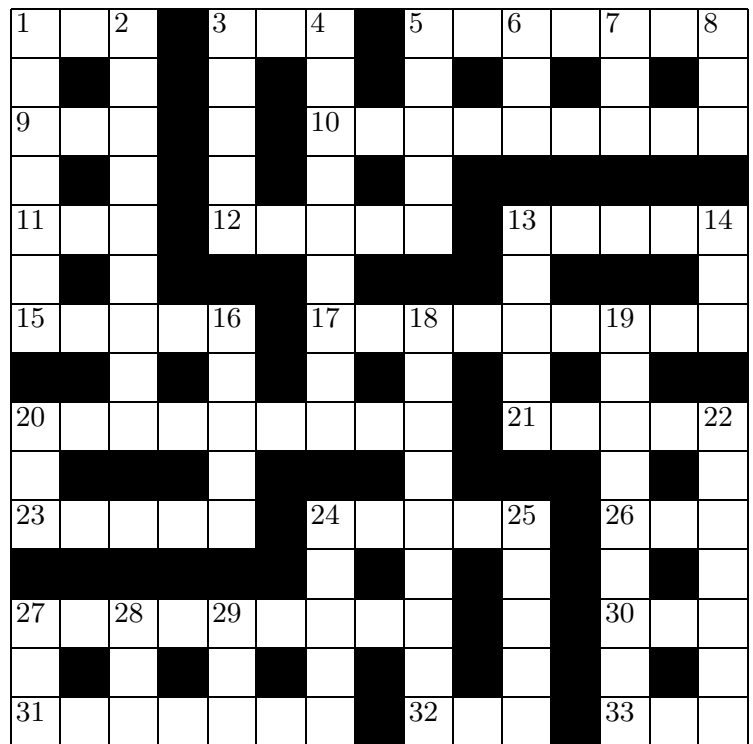
1. Odds
2. Processes in the Earth's crust
3. Inlet
4. Cascade
5. Famous Swiss mathematician
6. Minor demon
7. Encountered
8. Spot
13. Porcelain
14. Collection of tools
16. Delicate, small
18. Hampering
19. Inventor, craftsman
20. Small piece
22. Quickly
24. Of the moon
25. Cut off, removed
27. Gear
28. Before
29. Deception, fraud

# Quick Clues

Across

1. Feline
3. A paucity of
5. Puzzles, paradoxes
9. Crescent
10. Mind-reading
11. Dove sound
12. Worse
13. Brook
15. British county
17. Attacker
20. Shyly
21. Temple table
23. Giant
24. Dens
26. Dandy
27. Volume increases
30. North Atlantic fish
31. More verdant
32. Six-shooter
33. Half of a line

## This Week's Grid:



The answers to this week's grid may be found on page 6