

math NEWS

Volume 111, Issue 6

Friday, December 4th, 2009



BEARA-TROOPERS

Canada's New Plan for Afghanistan



9 770705 041004

lookAHEAD**mathNEWS**

December 4	Issue #6 fails your exams so you don't have to
------------	---

MathSoc

December 7-8	Spring 2010 Presidential Elections
--------------	------------------------------------

Math Faculty

December 5	A Saturday that feels like a Monday
December 9-22	Final Exams
December 24-31	University Closed for Holidays
January 4	Classes begin

CECS

Ongoing	Keep applyin' for them jobs, you fools!
---------	---

Miscellaneous

December 10	Human Rights Day
December 11-19	Hanukkah
December 15	Bill of Rights Day
December 21	Winter Solstice
December 23	Japanese Emperor's Birthday
December 23	HumanLight
December 25	Christmas
December 26	Shopping Extravaganza
Dec 26-Jan 1	Kwanzaa

**lookBEHIND too, just in case
someone's sneaking up on you.****Pints with Klingons?**

I have discovered a shocking secret: Klingons are amongst us.

Don't brace yourself for a bat'leth attack, though. I have simply discovered during Pints with Profs that Mike Lacroix is a Klingon spy. He learned the language in the 80's via an "instructional tape" that also gave him his orders. He is slowly weakening our society to make us easier to conquer. I suggest that to combat this we all tell him to "live long and prosper" and when he is confused we set phasers to kill. That'll teach those Klingon bastards.

ISSN 0705—0410

GroovyED

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 on the Internet.

The Editors would like to thank Software Engineering for being the program of most of them. The Editors not in SoftEng would like to point out they're filthy engineers and should therefore be burned at the stake.

This work is licensed under the Creative Commons Attribution-Noncommercial-No Derivative Works 2.5 Canada License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/2.5/ca/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA. Terms may be renegotiated by contacting the editor(s).

Your friendly neighbourhood *mathNEWS* Editors: ImpulsED, CorruptED, GroovyED

mastHEAD

Howdy concerned readers!

Imprint, you were begging for this.

On page 21, the Imprint rose the issue that the Women's Hockey team was being "unable to streak." Because of the rough equivalence in bagginess of both women's and men's hockey equipment, *mathNEWS* has discovered that this tragic disability must have something to do with the unhookability of the sports bra. Apparently, the only thing that is keeping these proud amazons from casting off their equipment and liberating themselves into the glory of streaking, enjoyed by many men, is a series of velcro, buttons or hooks that shackle them to their *iron maiden*, the bra.

Several proactive men have also decided to address this issue, saying that it would bring more equality to the sexes on the playing field and in the bedroom environment, like the men of the CSC, who are generally anti-clothing, whether it be bras or pants. Some men are, however, less supportive. Jeff Bain, the leader of the Men for the Appreciation of Bras (MAB) had this to say "I am totally pro-bras, especially for fat people." MAB has been gathering support for the continued enshacklement of women to their sports bras, arguing that, if necessary, men too will wear supportive garmentry, if that's what it takes. (Jeff Bain was unfortunately mauled by a rabid clone of himself before we could hold an interview.)

mathNEWS is planning a full investigation into this issue, calling upon our best (and only) female reporter (and cartoonist!) if she's not too busy (or graduated). In the meantime, on with the MathSoc Spring elections!

mastHEAD Question: What is your campaign slogan?

"Power to the perki!" (Micheal "perki" Perkins) "I'm not Insided!" (GroovyED) "Panda-ring to the public!" (Megaton Panda) "Come to me. I have candy and a van." (-the New Guy-) "A vote for me is a vote for good things! (If you know what I mean)" (Insided) "It's bigger! It's sharper! AND IT HAS MORE KNIVES!" (Big Mak, !CHO, The Other tree and !BOB) "You're not even going to vote, are you?" (cbhl lhbc) "Yes we can!" (Lich) "I will schock your socks off!" (Electric Mouse) "Because if you don't I'll tell your mom" (Tbor) "What the fuck is the mastHEAD question?" (Thor) "Elect me and I'll ban InsideED from puns("CorruptEd")

ImpulsED

"Sports bra unhookage: the plight
of women is the plight of us all"

A wild EDITOR appears!

Got away safely?

Welcome to the world of *mathNEWS*! Though it pains me to admit it, I am not the Pokemon Panda. I am also no Professor Oak, but that's besides the point.

I've said enough of who I'm not, I am GroovyED, your new editor. Why groovy do you ask? I suggest you ask Angelo, as I have no idea why this is my name. I however will stick with it, unlike one Insided. I'll be around in the spring term and future terms to wreak havoc on this paper. Look forward to it!

GroovyED

Who let me in here?

Prez Sez

you read

So yeah... Prez Sez, Prez Sez... Right so in the last prez sez I explained to you how we've come to this situation as me as the 3rd MathSoc president this term. I suppose all that's left is for me to report on what I've done as president since appointed but that's boring and I'm super busy with final assignments and prez stuff so instead I'm going to tell you a few things for you to think about and remember in order to be as successful/AWESOME as me:

- I look to the future because that's where I'm going to spend the rest of my life.
- It is bad luck to be superstitious.
- If you go to clown college, what do you call the funniest guy in class? Remember, without me it's just aweso!
- Doing nothing is very hard to do because you never know when you're finished.
- If you don't pay your exorcist, you can get repossessed.
- A true optimist would think the glass is half awesome!
- What's another word for Thesaurus?
- The reason people hate me is because I'm so universally liked. [Note: No one hates me :D]
- Power corrupts, and awesome power corrupts awesomely!
- What I look forward to is continued immaturity followed by death.
- What would Scooby do?
- And finally life lesson #57: drinking whisky out of apples leads to threesomes.

I hope that will help you all become more AWESOME individuals because now that this term is coming to an end I will no longer be your president. This up coming term I will be on coop but once I return in the spring term I will be your VPA which we all know stands for Vice President of AWESOME!!! I'm glad could leave MathSoc on a strong note and I hope you've all enjoyed the things I've done for you as president. I assume this is true since I have not received any complaints except for the ones that don't count :P

You 3rd Fall '09 President signing off
Andre Magalhaes

24 Hour Games Day!

Hello everyone! As classes wind down, the games directos for MathSoc have worked together with WatSFIC to help present a 24 hour board games day! It will be held from noon to noon on Saturday December 5 til Sunday December 6. It will be in the MC Comfy Lounge from noon until 4 PM, then shift over to the C&D from 4 PM until 7:30 PM and then back to the Comfy for the remainder. There will be FREE (That's right, free!) food for all those who show up and play games, courtesy of MathSoc and WatSFIC.

So come out and have some fun (and food!) and make some friends before exam season makes you realize what pain is.

Harrison, MathSoc Games Director

Insided wanted to put a that's what she said joke here.

CorruptED said No.

Insided said "that's what she said."

Thor's CS Problem of the Fortnight

Barrel rolling through the gunfire of Computer Science

Last Fortnight's Question: Imagine that you look in your kitchen, and you notice that you have three ingredients for your next recipe: eggs, milk, and sugar. Assuming that a "dish" is a combination of ingredients, list the dishes that you can produce using these ingredients (don't forget the empty dish!). In general, what is an efficient way to generate all of the dishes for a set of ingredients?

Its Answer: The problem described here is subset generation, and it's a pretty important one (I was asked this in a big-name interview last year, actually). You've got a set, and you want to generate all subsets of it. There's a really easy way to do this - it's the famous "binary counter" approach. Just count up in binary, like so: 000, 001, 010, 011, 100, 101, 110, 111. Then go through your set items and put them in the subset if there's a "1" in their place, and leave them out if there's a "0". Easy and fast! This is also a quick way to figure out how many subsets there are of a given set - it's obviously 2^n , where n is the size of the set. Another way to do this, of course, is with the Gray Code method of writing down set elements one at a time, and then appending the element you just wrote to everything above it. This will generate minimal changes between iterative steps as well, which is useful for some applications.

This Fortnight's Question: Imagine that you work for an air travel planning company. You have a big map that has the airports of the world on it, and which shows which airports have direct flights between them. Your job is simple: You need to write a web app that allows your customers to figure out if it's possible to get between two airports of their choice. How would you efficiently solve this problem for your application?

Thor

Political Incorrectness

*Holy crap, mathNEWS writer agrees with Imprint!
(somewhat)*

So like the Points Yet Unrelated article, I am also somewhat annoyed by the so called "politically correct" crowd. It seems to me like we need some way to drive the point into their heads that avoiding references to religion isn't going to offend fewer people. I propose the following solution: We create a new religion and name a holiday after all of their "euphemisms". Have someone calling your Christmas tree a Holiday tree? Make a holiday called "Holiday", then claim you're being offended by the reference to someone else's religion. Someone called your Hannukah celebration "Winter season festivities"? Get offended that they're referring to the wrong religion. See the pattern yet? Go apply it. I will suggest we name the religion "Statutory", to cover all of those days as well.

The Other Tree

Election Information for Spring 2010 Election

Due to Maria Christina Greco resigning as President of MathSoc for the Spring 2010 term, we're having another election. (Note that since all candidates ran unopposed, all positions were acclaimed.) Since Maria's resignation, there have been four candidates nominated for President, although one has dropped out of the running. I have asked each of them to write an article about themselves and their plans for the position.

mathNEWS hosted a debate on Wednesday. It was filmed so that you can get more information on the candidates and their stances on various issues. There is a link to it at <http://www.mathnews.uwaterloo.ca>. Please watch it and read these articles to be an informed voter.

Voting will be taking place on Monday Dec 7 at 12:01 a.m. to Tuesday Dec 8 at 4:00 p.m. Please visit <http://www.mathsoc.uwaterloo.ca> for more information.

GroovyED

Kenneth Kou

Serious question: What has MathSoc ever done for you? Each term, you pay a \$12.50 levy to MathSoc. Tell me, what have you gotten out of this money?

As it stands, our funds are being diverted to events which serve 1% of the student body. Really, a MathSoc movie night? Have you ever been to one of those? These self-serving events are not what MathSoc needs. We have to create a MathSoc that understands the true value of student involvement.

The Excel tutorials put on by DDC, the Dodgeball tournament with Profs by ActSci Club, and various Prof-Talks. These are just a few examples of amazing uses of MathSoc funds. They allow students to build relationships with professors outside of the classroom, and teach practical skills necessary to succeed in the real world.

We must work with businesses in order to foster an environment in which students can develop socially and professionally. Speakers from industry could provide invaluable insight into the world outside of school. We need the opportunity to engage our peers at other universities in conferences and competitions. Such events will foster learning and reflect the level of education offered at the University of Waterloo, and will help the Faculty of Mathematics entrench itself as a global leader in Mathematics and Computer Science.

I'm Kenneth Kou, a 4th year Math/Business Double Degree student. I truly believe MathSoc can be a successful organization. We deserve better. That's why I'm running for President.

Thank you.

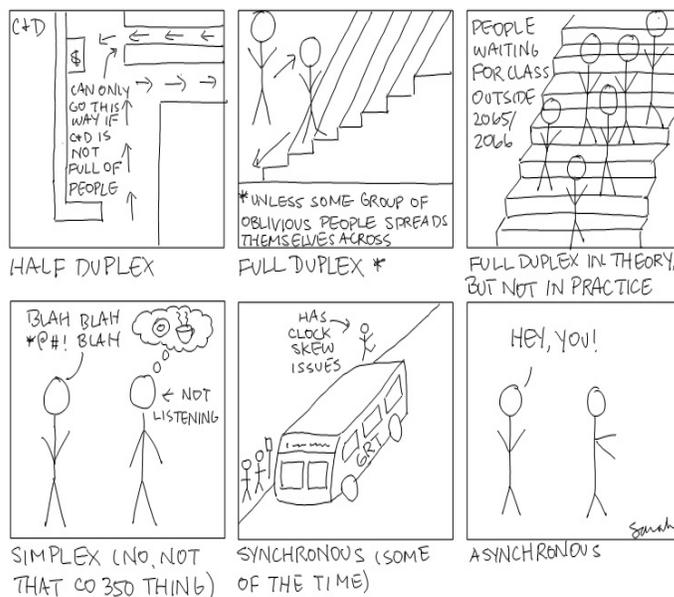
Joseph Collins

Hello, fellow mathies! My name is Joe Collins, I am in 3B Software Engineering (which is as much a math program as it is engineering), and I am hoping to become your President during the Spring 2010 term.

The fact that you are reading this instead of just *prof*QUOTES right now is a very positive sign, because it shows that you have an interest in what's going on in MathSoc. Unfortunately, most people who pay MathSoc fees aren't fully aware of what's going on, and if I'm elected, I plan to take great steps to resolve this. From new postings boards in higher-traffic areas to a new mailing list for society announcements, my goal is to give you the information you need to make the most of the \$12.50 you pay every term. I also plan to work on a framework that will bring the Exam Bank up to date and the C&D back to profitability, so that we can better serve YOU!

My experience as secretary of MathSoc for two terms has given me a good working knowledge of how MathSoc runs, and my role as Director of First Year Affairs has given me a sense of what students want from us. Additionally, I have gained leadership experience as an Orientation Director, Student Life 101 Director, and *mathNEWS* Editor. In the meantime, feel free to visit my website at <http://collins4prez.blogspot.com>.

REAL LIFE APPLICATIONS - DATA FLOW



Eric Van Halteren

Hello everyone! My name is Eric Van Halteren and I am 2B Honours Mathematics (soon to be Mathematical Studies). I am extremely excited to be running for the position of President in MathSoc in Spring 2010.

I have been involved with MathSoc for over 2 years now. In first year I represented math students as part of MathSoc council, where I gained knowledge about the inner workings of the society. Throughout my second year, I have acted as a helping hand for many of the activities provided by MathSoc, and am currently the Postings Director this term.

I am running for the position of president because I have seen what MathSoc has to offer, and I have many ideas to further improve these services in an attempt to make MathSoc even better for you, the students. Some of these ideas include, but are not limited to, increasing the presence of MathSoc by making our services more known through advertisement and student representatives of MathSoc. In addition, I would like to make MathSoc more open to student opinion. This could be done by including a student opinion section on the MathSoc website, as well as creating surveys that can be filled in by students. As well, I want to expand the exam bank through the help of student representatives, and get more involved with helping improve the C&D financial status.

If you have any questions about my platform, you can visit my facebook group Eric Van Halteren for MathSoc Prez Spring 2010.

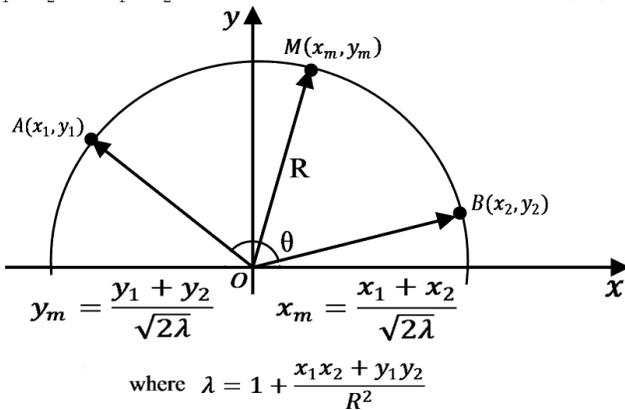
Dot Product Finds Arc Midpoint

Everyone knows the good old midpoint of a line segment formula: if two points in xy -plane are given by $A(x_1, y_1)$ and $B(x_2, y_2)$, then midpoint $C(x_0, y_0)$ of the line segment AB has coordinates $x_0 = (x_1 + x_2)/2$ and $y_0 = (y_1 + y_2)/2$. This is simple enough. Now take these two points to be on a circle, centered at $(0,0)$ and find the coordinates of a midpoint $M(x_m, y_m)$ of the arc AB . Suddenly there is no formula for such a simple problem.

Of course you could use your geometry skills to find the midpoint C of the chord connecting the two given points, then find the equation of the line through C and the origin, and finally find where this line intersects the circle. On any given day this should not take you more than 5 minutes. So, let's consider a three dimensional case. Using the above method might take as much as 15 minutes. Want to derive a quick formula? This will most likely lead you to discover different cases, and memorizing which one works in which octant is not the most optimal solution (even for a computer algorithm). But if that doesn't scare you, just think of the n -sphere! Consider an alternative.

Let $A(x_1, y_1, \dots, z_1)$ and $B(x_2, y_2, \dots, z_2)$ be fixed points on an n -sphere of radius R centered at the origin $O(0, 0, \dots, 0)$, such that AB is not a diameter. Let $M(x_m, y_m, \dots, z_m)$ be midpoint of arc AB of radius R (see diagram for $n=2$). Consider vectors $\mathbf{x} = OA$ and $\mathbf{y} = OB$, and define $\lambda = 1 + (\mathbf{x} \cdot \mathbf{y})/R^2$, where dot is the standard dot product. Then vector $\mathbf{m} = OM$ is given by $\mathbf{m} = (\mathbf{x} + \mathbf{y})/(2\lambda)^{1/2}$

The proof is very elegant. Consider the vector sum, $\mathbf{u} = \mathbf{x} + \mathbf{y} = (x_1 + x_2, y_1 + y_2, \dots, z_1 + z_2)$. Since, by construction, $\mathbf{m} = (R/|\mathbf{u}|)\mathbf{u}$



we get:

It is interesting to note that midpoint of line segment is a special case of arc midpoint as R approaches infinity. You can see this since limit as R approaches infinity of λ is 2. This is expected, considering that arc AB has a finite length (otherwise it would not make sense to talk about its midpoint), and therefore arc loses its curvature as radius is becoming infinitely large.

You may be wondering, aren't there two arcs joining A and B ? Indeed there are. The above result gives the midpoint of the shorter arc. To find the midpoint of the longer arc simply negate all of the coordinates of M .

Alex Akulov

Oleksandr G. Akulov

Sound FM Will Live On

Programming will not cease at 6:30pm today, as originally planned

Instead of attending this week's production night, I was assigned to get the inside scoop (or should I say, InsideR Scoop?) on how Sound FM plans to survive after being denied their fees yet again.

After a sob story about the station losing 22,000 members after the failure of the first referendum, the Sound FM Board of Directors announced that, as of Friday at 6:30pm, they will switch to a pre-recorded broadcast schedule as they move from the Bauer Warehouse to their new home at Maxwell's Music House (King and University), and will return to live programming around mid-January. To finance the station, they will be asking all volunteers who run a show to contribute \$50 per month, which can be out-of-pocket, sponsorship or fundraising.

They showed their 2009-2010 budget, and I'm not sure that the maths quite work. For one, they say that they need at least 100 radio shows to make this sustainable. Presently, there are not enough shows to make this target, and it is likely that some will leave the station for being unable to raise this fee. The other issue is that they plan to raise \$12,000 per year in fundraising, though this past year only showed \$2,500 in fundraising revenues. President Steve Krysak said that they will look more towards the community if this funding model fails, and would not rule out increasing the \$50 contribution.

So long story short, 100.3 Sound FM will continue as a radio station despite the lack of student funding.

InsideR

An Ethical Quandary

So IBM announced that they're close to simulating a cat's brain. Ignoring the voices yelling out that they are scamming us all, if they actually develop something such as this, what happens when they take the next leap, to simulating a human brain?

Obviously, the psychologists and biologists would be yelling at me at this point, but let's assume that it's possible to simulate a human brain inside a computer. Is this brain then considered a person? Would it even be conscious? These are things that puzzle me, for to get a true simulation of a human brain, you would have to give it some sort of sensory input, for if you give it nothing, how can it learn?

Then, if it is a person, can we ever end the simulation and be morally right? It could be said to be equivalent to murder, but then again should a human be allowed to live forever? I'm glad that I'll never be the one who has to make this choice.

GroovyED

Lack of sleep makes me this way

dissedCONNECTIONS

To the cute chick with the part blonde/pink hair. Your hair smells wonderful. Voulez-vous coucher avec moi?

Creepier

To the cute girl with the pepper spray. My eyes are better, but my heart still burns for you. Can you ever love a desperate mathNEWS editor?

CorruptED

Giftng for the Other Half

Your guide to finding the perfect gift for that "friend"

The holidays are quickly upon us and shoppers are scrambling to get their lists in so they can work on finding the gifts to give to their family and friends. If you're like me, you probably have no idea what to get until the last minute. Today I'm going to give you gift suggestions for the person most difficult to get a gift for: The significant other. Whether or not they know that they are your significant other is irrelevant, we all know the pains of getting a gift for that purpose. My ideas are 100% legit and 20% better than the leading brand of suggestions! I've sorted it by their field of study. For the sake of not having to type him/her all the time, I will assume your significant other is an object and use the proper tagging of "it".

Act Sci: Crunching numbers about death is fun! Buy some life insurance to make it extra meaningful. That way, if you accidentally get offed, your partner can benefit from that extra bling in the stocking!

Applied Math: Applying all that math it learns is a pretty difficult job, so definitely don't get anything that may require math. Instead, get it something that doesn't require the user to think. For example, get it the DVD for the first **Twilight** movie. It's great for forcing mindlessness!

C & O: You can impress your partner with your optimization skills by getting the most out of the gift! Instead of buying fancy jewelry or mementos, buy a wrench! Then it can appreciate the heart AND use it to fix things. Other useful suggestions include toothbrush (Think of me when you brush!) or condoms (think of me when you are in me?).

Computer Science: If your partner took one of the big three this past term, they're probably too tired to spend time with you anyway, so no need for a gift! Unfortunately, if they didn't, you can remind them of what they missed with a shiny new electric train set!

Computational Math: All that computing is really putting a toll on your partner, so to let it de-stress you should get it one thing it's already doing but doesn't have: A whip!

Math/Business: Business people are already going to be rich, so you want to get out of the high cost mentality. Get it something simple, yet heartfelt. For example, a picture of a million dollars! Or, if you want to get away from money completely, get it a rock! You can then make it into a pun, a simple heartfelt pun!

Mathematical Physics: Physicists are amused by the easiest of things, especially bouncing balls. Why not ignite their passion by buying them a bag of superballs? They bounce like crazy and they're fun for hours.

Operations Research: Really, what are they researching? Certainly not good Christmas gift ideas, like me! What you really want to get them is a spy kit! Something like... Magnifying glasses and a detective hat, to help them research with more awesome

Om nom nom

Who else knew that Cookie Monster was the source of "om nom nom"?! Why didn't anyone tell me? Now I want a cookie.

Clueless and Cookieless

attire!

Pure Math: Don't be silly, no one wants to date a Pure mathie. Of course, if you **really** wanted to buy yourself something and pretend it's from someone else, make it a box of chocolates: impersonal but delicious.

Statistics: You don't need to get them a gift at all! If they ask, just tell them there was a 99.6% chance they'd get a fantastic gift but they didn't beat the odds. If you really wanted to buy them something instead for the same reason, buy them Lotto MAX tickets. You bought something, they get nothing. Yay!

Math Teaching Option: Turn the tables on the lecturer by giving it a stern lecture about cleaning up around the house (You call it nagging, I call it negative reinforcement) I hear role-playing is particularly hot, so maybe a yardstick and a table...

Mathematical Sciences/Studies: Your partner has a lot of freedom to take what it wants, so you should make it even freer! A gift of money to buy whatever it wants is a perfect gift for the free-spirit, in my opinion.

Software Engineering: Softies are weird, I don't know why you're dating one. I hear they're unhygienic too, so get them a whackload of hand sanitizers to keep those bacteria far away!

Applied Health Sciences: You can show them how much they mean to you by getting them a stethoscope because they can listen to your heart. Or, even better, when making a huge decision, they can literally listen to their heart to make the right decision.

Arts: Arts eh? Prepare your partner for its future career by getting them a set of equipment! I'm thinking a spatula, a toy cash register and a hat from McDonald's!

Engineering: Since your significant other is in Engineering, your best bet is something alcoholic, so surprise it with a 6-pack of ale from the local breweries!

Environment: Demonstrate to your partner that you care about the environment by saving on clothing costs when at home! All you have to do is stop wearing clothing when at home (particularly when your partner is with you). Problem solved!

Science: In science, the pursuit of discovery is just as exciting as the end, so excite your partner with a treasure hunt all around the house (or school) until they stumble upon their gift. Something like... a pencil. Convince them it's an alchemist's lead pencil and it'll turn into gold eventually and they will love you more!

Other: When all else fails, get the generic gift that never fails to please! A pair of black socks will brighten up everyone's day.

Remember! Christmas is a season of giving! Get your partner the best possible gift for a very memorable Christmas! Except for you, pure mathie!

Santa Panda

Back In My Day...

- Spam was a lunch meat, not an unsolicited email.
- A crop was something that was grown, not something that was removed from a picture.
- Java contained caffeine, not classes.
- Scheme was an evil idea... wait, it still is.
- The only Firefox known to man was on Bambi.
- Imprints made an impression on you.

Lessons of 1A

The various and sundry lessons instilled in me by my first term

1. University is nothing like what Asher Roth describes. At least not for me.
2. You mean we actually have to put in work for classes...what's work?
3. Prime numbers do not exist in fields.
4. Divisibility is meaningless in fields.
5. Sleeping in the Comfy is not uncommon. But the name is somewhat misleading. Sleeping on those chairs is many things, comfortable not being one of them.
6. Programming in C gets really annoying, really fast.
7. Textbooks are not always essential, but they do help.
8. The behemoth that is math is built on few pillars, which we have to trust are actually there.
9. Wearing a suit to an exam isn't just stylish, it has the added bonus of dating the exam into letting you get a good mark.
10. Drinking before noon makes you feel really classy.
11. Nobody cares if you aren't in class.
12. Nobody cares if you don't hand in your assignments. That is, until you fail, then you'll care a lot.
13. Better superstitious than sorry.
14. Failure is not an option. Oh wait, this isn't high school, yes it is.
15. A "reasonable" amount of sleep is redefined.
16. When all else fails, throw the problem at Maple and see what happens.
17. Laziness can be a virtue.
18. To understand recursion, one must first understand recursion.
19. Infinite loops don't blow up in your face until you try to run them.
20. When inspiration fails, make a list.

— theNewGuy —

Fun With Graphing Calculators

If you've got a graphing calculator, you should know about their use as entertainment during those long hours of boredom otherwise known as lectures.

Here's a few functions to start you off.

- $Y = \sqrt{25 - x^2} / 2.5$
- $Y = (2 \operatorname{abs}(\sin^{-1}(\sin(3x))) / \pi)$ (equation 1)
- $Y < (x^2 - 25) / 16 - 1$
- $Y = 0$
- $Y = 0.2e^{\cos 8x} - 1$

For those of you who are wondering, it was done during chemistry.

The Other Tree

mathNEWS is a healthy part of a balanced biweekly breakfast.

Interesting things to do around campus

So you haven't had one of these articles for four weeks. some of you may be going into withdrawal, and some of you may have taken up dangerous hobbies for excitement. Others may not care, but that's life. Anyways, here's your fix.

- Build sand castles in the bins of sand they have around to spread on the paths.
- Burrs stick to geese. Use this knowledge and a slingshot to attempt to velcro two geese together. If they haven't migrated by now, they're probably stupid enough for it to work. If you can't find any geese, ducks may work as well.
- Walk into a random exam and write it.
- This week's different sounding floor tiles are actually in MC! Sixth floor, just outside the southeast stairwell, inside the circle on the floor. Remember to take a ball of yarn, a GPS, several maps, and a guide so you don't get lost. Supplies of water and food to last approximately a week are also advised. You won't have to go far into the sixth floor, but strange things happen up there.
- Decorate the wall by the stairwell in Env 1. It's large, it's blank, and it has lights pointing at it. All it needs now is people to write things on it. Things like proofs of the mean value theorem, or the code for quicksort, written in assembler.
- Figure out the minimum number of tunnels or bridges that would need to be constructed to allow the entire campus to be connected via indoor routes. Graph theory is your friend here.
- Figure out which of this week's interesting things to do has been used in a previous *mathNEWS* issue
- Convince someone else to do any one of the listed activities. Bonus points if it's one of your professors.
- Spread salt onto cafeteria tables in a line, then leave a straw next to it.

The Other Tree

ultraCLASSIFIEDS

Wanted: Whoever is taking down election posters. Please bring them to mathSOC to be hung upside down for several days

For Sale: One enormous ego, belonging to most of the *mathNEWS* Editors. Cost: OVER \$9000! Call ext: 36355 if interested

Personals: Lonely *mathNEWS* editor seeks real girl who is capable of dealing with egotistical, unfunny mathies. Contact CorruptED via birdcall, telepathic message, or interpretive dance.

Wanted: Your votes. /Shameless plug by InsidED.

Professor Dupont Facts

Have you ever imagined Chuck Norris doing calculus?

Perhaps you've been following *profQUOTES* this term. Or maybe you're lucky enough to see him three times a week. If not, please prepare yourself for the 9001% Awesomeness that is Professor Dupont.

- Professor Dupont once calculated how much sweat a donkey gave off, while it was kicking at a mixing tank that had wind blowing onto it. In his words, it "was a straightforward problem."
- If you want a pumpkin thrown at you, throw a tomato at Professor Dupont.
- Speaking of pumpkins, the Headless Horseman dresses up as Professor Dupont.
- Not only does Professor Dupont check integrals with quick derivatives, he also checks derivatives with quick integrals.
- Thanks to Professor Dupont, all sky-diving bears are required to eat honey during their descent.
- Professor Dupont actually invented calculus, because it was "so obvious." Newton and Leibniz stole his notes. Newton and Leibniz are now dead. Professor Dupont is not.
- *Quod erat demonstrandum?* Professor Dupont is too cool for Latin. He ends his proofs with "booyah!"
- Professor Dupont calculates integrals from first principles — and programs in machine code — for fun.
- Have you ever tried increasing the number of sides on a hexagon? Professor Dupont once did that, and it was *still* a hexagon.
- Professor Dupont has a tuba player accompanying him everywhere.
- If you use the word "impedance" at parties, you will probably be kicked out. If Professor Dupont uses the word "impedance" at parties, his Cool Factor increases like the Ackerman Function.
- Professor Dupont understood lectures better when he didn't take notes, but everybody else who tried that strategy failed out.
- Professor Dupont once got kicked by Optimus Prime, but laughed it off, saying it wasn't as painful as integration from first principles.

Unfortunately, it is not quite possible to accurately represent Professor Dupont's Awesomeness in paper form. But I did my best.

!Bob

Womens Hockey: Unable to Streak

Fans disappointed

The Waterloo women's hockey team has yet to show their best this season, and we all know the reason why.

It is a little-known secret that the girl's hockey uniforms have been changed from their well known uniforms to clever imitations that are identical in every way, except that they have been slightly modified to stay on better. This is a major concern, as avid sport fans worry that our fine (and I mean *fine*) girls haven't been showing off their true potential on the ice.

Modifications to the uniform include:

- More opaque jerseys, preventing fans from getting a better view of the game.
- Secure sports bras, made with StayOn 2.0 technology.
- Better belts, keeping the pants on way too high.
- Sharper skates, making the girls blur by so fast that we can't see a thing.

This is a major concern for our stalwart hockey fans, and for the student body. This motion to spend valuable student money on these new uniforms has been passed without any publicity, with a large part of the student population unaware of this act. With all of this fanfare in our recent referendum about unimportant issues such as expanding the Health Services building and building a new Student Services Complex, it seems odd that the student were left in the dark about such an important decision. I for one would have voted "no" to such an unimportant expense, as I enjoy watch our girls playing without any inhibitions.

Hockey is such a physical sport, and because of this unannounced decision the womens hockey team has been restrained to a shadow of their glorious selves.

Big Mak

The 12 Days of Finals

On the n th, $n \in \mathbb{Z}$, $n \in [1, \dots, 12]$ day of finals, my TA gave to me...

- $n = 1$: a bell curve to make sure I pass!
- $n = 2$: two painful proofs
- $n = 3$: three midterms
- $n = 4$: four Maple labs
- $n = 5$: five formulas
- $n = 6$: six handy cheat sheets
- $n = 7$: seven calculators
- $n = 8$: eight office hours
- $n = 9$: nine study sessions
- $n = 10$: ten desks in DC
- $n = 11$: eleven double doubles
- $n = 12$: twelve practice finals

TCog, RSA Scheme, Wiley

Nine Surefire Ways to Get Out of Your Exam!

In the spirit of upcoming exams, I have devised a list of surefire ways of getting out of exams. None of these are recommended, but I guarantee (this guarantee is not a guarantee) that they will work.

1. Just start hyperventilating until you pass out. If you wake up, just rinse and repeat. Pro: What are they going to do? Poke you every time you pass out so you wake up? Con: Probably not healthy
2. *requires a friend* Before the exam starts, have your friend and yourself kick the crap out of each other until you look like you got on the wrong end of a pissed off bear. Then, walk into the exam and say you were attacked on the way over by a bunch of people and had all of your stuff stolen. (bonus if you are able to pull a tooth out in front of the proctor) Pro: It is almost certain that they will let you go handle things with the police instead of writing your exam. Con: It hurts
3. Drink lots of salt water when you sit down with your exam, and then throw up on your exam. Pro: They will be afraid that you have swine flu Con: You have to throw up.
4. Contract swine flu. Pro: They will know you have swine flu Con: You will turn into a flying pig
5. Disappear for 2 weeks and then phone the university from Texas saying you were abducted and have been fighting for your life in the basement of a shack. Pro: By the time you get back to Waterloo, the exam will be done Con: You're in Texas
6. Mental Breakdown. This one's a classic! When you feel the timing is right, start screaming hysterically, yelling something like "get 'em off me!". You can then proceed to jump out from your desk and either a) run around flailing your arms and tripping over imaginary tree stumps while stripping off your clothes yelling "they're all over me!" or b) lie on your back flailing your arms and legs in the air above you. When the proctors try to help you, scream louder and flail at them like they are what haunts you. Pro: Don't lie, you have always wanted to do this. Con: Requires very good acting. Need to stay in role for a long time
7. Commit a very illegal felony and become a wanted individual (don't ask me what...just go with your gut). Next, stay hidden from the police until the day of your exam. Near the start of your exam, phone the police from a pay phone and give an "anonymous tip" as to your whereabouts during the time of the exam. If you time this right, the moment you start the exam police will come in, tackle you, and take you away (make sure you struggle so that it is more epic) Pro: You will always be remembered as "the guy/girl who got dragged out during exams" Con: You will go to jail.
8. When the exam starts, raise your hand and swing it frantically. When the proctor gets to you, tell him in a quite strained

voice that you have explosive diarrhea and don't think you can sit through the exam (it will work better if you start sobbing and say "it's running down my leg!") Pro: I highly doubt they will let you write it while on the toilet. Con: Whatever dignity you had is gone.

9. Find a flask and fill it full of blood (preferably your own for safety reasons). Just before starting the exam, fill your mouth with the blood from the flask. About 5 min into the exam, start coughing hard with your hand over your mouth and get blood all over your exam. At this point what you want to do is start spasming and fall out of the desk (bonus if the desk falls with you) and pretend to be unconscious. Pro: How on earth would this not get you out of an exam?! Con: You may accidentally drink some of the blood.

Of course, all of these ideas will either get you expelled, arrested, or in some sort of trouble. In reality, you could just spend some time to study for your exams, but where would be the fun in that? It would be much more productive just to grease up a pig and let it loose in the gym when your exam starts.

Mooshoo

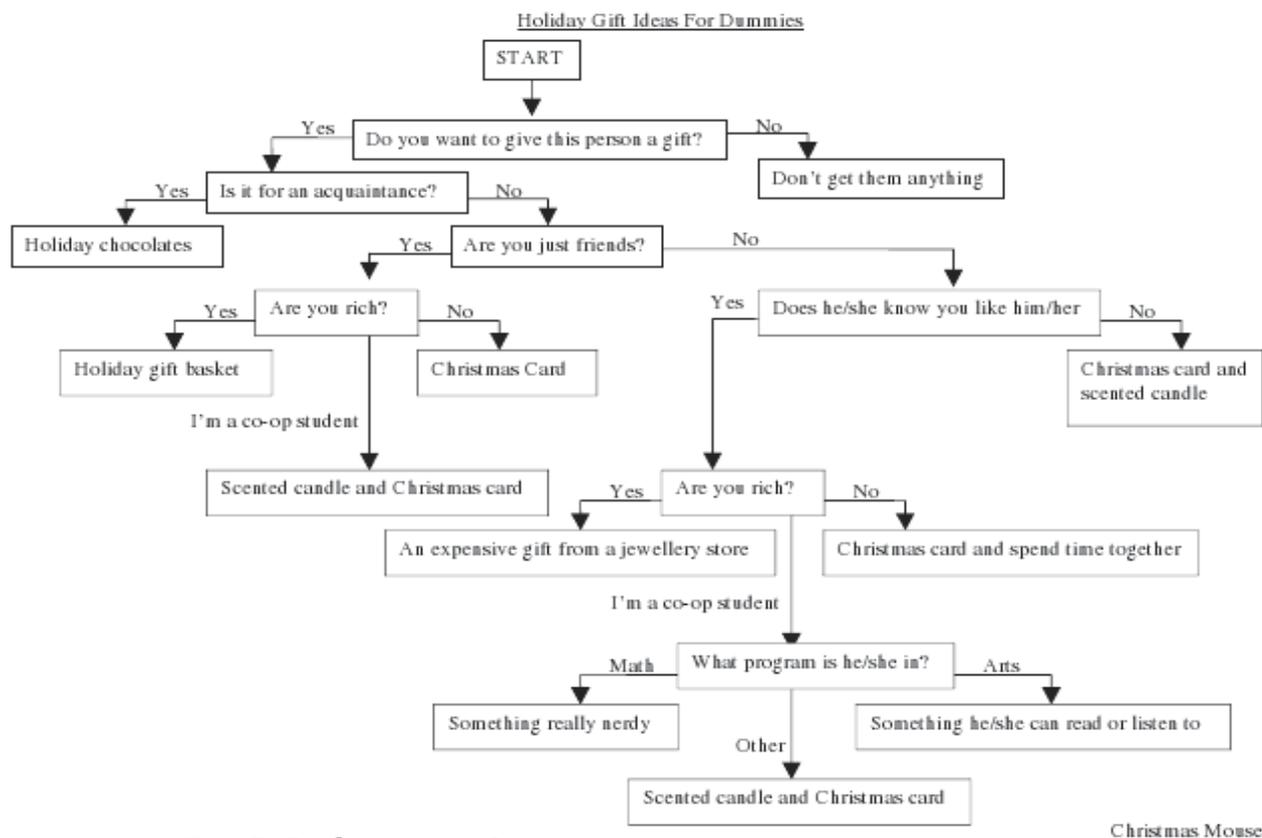
It's not as bad as you think!

The worst is yet to come!

Final exams are coming, and to many students this is the make-or-break point of their university careers. For those who are able to pass their courses this term without breaking a sweat, I salute you. For those who do not fit into that category, remember these few tips:

- At least you're not in Laurier
- Engineers have to retake their ENTIRE term if they fail a course. Even the stupid software engineers. Count yourself lucky.
- Studying for exams is just like studying for midterms-it's just that there are an extra six weeks of notes. Just take a deep breath, use the exam bank to take the previous years' exams, and you'll be fine.
- Whatever you do, do NOT take out Starcraft for some extra practise in anticipation for Starcraft II
- If you do fail, do not lose hope and transfer into arts. We'll only love you if you're a mathie.
- Try to study alone. That way you won't get distracted by your smart friends who would rather be doing anything else.
- If you must study with friends, make sure you study with others who actually want to study, and not those who want to hang out. If someone mentions bringing chips/pop/video games/hooks, you might be better off studying alone.

Big Mak



Is GO for you?

So apparently the GO bus service between Waterloo and Mississauga has been 4 or 6 or however many years in the making. Here are a few thoughts before you buy your tickets—

Pros

- Chairs on GO buses are padded
- There are overhead lights on GO buses, if you want to piss off the person sitting next to you trying to sleep by reading or doing work.
- The windows are reflect the bright light from the screen of the laptop in the lap of the person in front of you really well at night, preventing you from falling asleep on the bus
- GO service between Square One and Waterloo runs daily, and there are connecting routes to many parts of the GTA (e.g. Pearson Airport, Richmond Hill Centre, Union Station)
- Some transit systems provide “Ride to GO” or similar services which allow you to travel by local buses from a stop near your house to a GO station

Cons

- If enough people fail to buy tickets in advance, the bus leaves and arrives late
- GO buses can legally hold passengers standing in the aisle, so if you are at the back of the line (or get on in Kitchener) you might end up standing for the entire ride
- Your seat is not “reserved” — if there are way too many passengers, you may be waiting for the next bus.
- If you intend on obtaining a GO Student ID, the registrar’s office will likely charge you \$10 to sign and stamp the form, as they consider it equivalent to a standard “proof of registration”

letter. And after all that, you still have to bring it to Union Station in Toronto so that they can make it official and then laminate a portion of the form into your ID. And you have to do it every year.

- Student fares must be bought either in 10-ride bulk tickets (expensive) or monthly passes (more expensive)

Other considerations

- If you’re only going one way, a one-way ticket must be used within 4 hours of purchase. Two-ride and 10-ride tickets can be held for longer, but I don’t know for sure when and if they expire.
- Ticket prices vary depending on the distance you travel — stations are grouped into “Fare Zones” and tickets are only valid between a particular pair of fare zones. This limits the flexibility of advance-purchase tickets, but this also means that shorter trips are somewhat cheaper (which can be a good thing).
- Peak travel periods are Friday evening and Sunday evening during the school term, which means the buses are often near capacity when you go home for the weekend. On the flip side, if you’re lucky, GO Transit will send an extra bus to handle the increase in demand.

Personally, I think the expense is worth it — I’ll be taking the GO bus home once a month or so for the foreseeable future. But for others, that might not be the case — make sure you evaluate other options (Greyhound, Feds Bus, Ride from Family) carefully when you decide how you’re going to get home for Christmas.

And so ends another Term...

Seriously, where did the time go?

So it's been an interesting term. It was my first as Editor unlike InsideED and ImpulseEd, so it was full of fun new experiences for me. This issue's being "Help, the layout is pure Evil!" due to InsideED having to be somewhat hands off with an issue in which he is campaigning for conflict of interest reasons. So I guess it falls down to me to do our usual end of the term spiel, so here I am.

First off, I really want to thank all of our writers this term. We had a very dedicated crop this term, and we tended to see the same faces again and again, which is always nice to have regulars. I'm especially happy that we had such a huge turnout for new writers, a lot of frosh were here every other week helping to write a whole bunch of great articles. Admittedly, a lot of hem were Software Engineers, so to you mathies out there... STEP UP! We always love having new writers, no matter what you want to write about. Math Jokes, Computer Jokes, Interesting stuff you've noticed, Onion Style Parodies, Comics, anything you want to contribute! We're always happy to see new people, and *mathNEWS* is one of the most fun things I've ever done.

Secondly, I want to thank you. Yes, you! Without our loyal readership we'd be like SoundFM, a media outlet without an audience. So keep doing what you're doing, and we'll keep bringing you all the humour-y and sometimes news-y goodness that you've grown accustomed to. Likewise, we always love Feedback, so drop us a line at mathnews@student.math.uwaterloo and we'll happily respond.

Anyway, besides thanking all of my fellow Editors for their help and hard work, I think that's about all I have to say on the matter. ImpulseED will be editing along with StaticED and RamiED during the coming Winter Term, and me, InsideED and our newest addition GroovyEd will be back in the spring term, assuming I don't horribly fail all my exams and get rocketed to the moon by my parents. That said, Good luck everyone on your exams,

studying feverishly from here on in,
CorruptED

***mathNEWS* offers this advice
for the coming exam season:
Don't fail.**

Dick

That's right, I'm talking about you Mr. Nixon.

Despite the idea that this article is about a former President of the United States, it is truly about something else. Let's call this something "x" for the sake of argument.

What is it that makes x so special? It can form curves, lines, or strange droopy functions. If you divide x, you make many people squeamish, but if you multiply x, you may be subject to various law suits. The PC misunderstand x. And yet many cherish x, often devoting their time to it. In the end, x cannot be ignored, no matter what operation you perform on it. It will shock, perplex, and manage to produce more x.

The Gross Man

Electrium

Why We All Need A Little More In Our Diets

Canada's Food Guide has reported that a diet low in electrium can lead to mental fatigue, physical fatigue, mood swings, hallucinations, decreased sex drive, violent diarrhea, violent crime, bouts of insanity, or the desire to study pure math. Whats even more shocking is that most people have never learned the importance of electrium intake. I am here to provide you with information on the benefits of electrium, good sources of electrium, and advice from an expert in the field.

Let's begin with a brief history: electrium is the 0th element of the periodic table. It was first discovered by the Chinese philosopher Confucius who had nothing to do while everyone else was busy inventing math. Confucius noticed that when he ingested electrium, he became very good at making proverbs. This was also noted by other famous philosophers throughout history.

Electrium should always be included in a balanced diet along with calcium, magnesium, and potassium because it has many health benefits. Electrium increases lip muscle strength, improves memory span by up to 30 seconds, makes you immune to Twilight paraphernalia, and reduces your chances of being injured in snowmobile accidents (although it may increase your chances of being struck by lightning). Some foods that are high in electrium include: electric eels, mushroom cream cheese, grape-flavoured children's cough syrup, guava mixed with red bean, and yellow snow.

Here are some frequently asked questions about electrium answered by world-renowned scientist Professor Oak:

Q: Will eating a lot of electrium give me superpowers?

A: No one knows for sure. It may be possible, but it is very likely that you will get hemorrhoids.

Q: Will eating more electrium get me a girlfriend?

A: Yes it probably will! Electrium will decrease your chances of studying pure math and we all know that no one wants to date anyone in pure math.

Q: Can I become addicted to electrium?

A: It's possible but there are many ways to prevent this. Stop taking electrium immediately if you notice any of the following signs and symptoms: if you have an incredible urge to chew through electric wires, if you sweat cheese, or if you have recurring dreams of being carried on the shoulders of a young boy in a Japanese children's cartoon show. Once you stop taking electrium, you will go into a period of withdrawal for about 2 to 3 years. If you wish to reduce this time, you may wish to take up recreational drugs for a while.

Electric Mouse

***mathNEWS* has a copy of
Microsoft Word so old, we still
have to deal with clippy. Pity us.**

**Alternate: Pity us for having MS
products**

Horrorscopes

Because we all have to have horrible things happen to use once in a while.

Yours are just more horrible than mine.

Accounting: You try to solve the problem of the Bomber not making money. You turn it into a strip club, and to add some edge, you add a water slide. Your mother is less than amused.

Your lucky number is: \$13 Million in profits.

Actsci: You decide the dangers of skiing don't lower your life expectancy enough. You try heli-skiing. Really? I mean, Hell is in the name!

Your lucky number is: 14%

AHS: After playing Assassin's Creed 2, you start freerunning across campus. You should've joined the Parkour club instead, because there aren't a lot of hay bales in campus.

Your lucky number is: 7 Floors

Applied Math: You team up with a statistician, and spend 20 hours to figure out what the best choices in a multiple choice exam are. Unfortunately, your prof has hired a monkey to pick the choices.

Your lucky number is: 4 bunches of bananas

Arts: You go back in time to visit the Roman times to help study for your final. You get caught in an orgy, and accidentally get assassinated.

Your lucky number is: 69666

BBA/BMATH/MATHBUS: You decide to drink at every pub between Laurier and Waterloo between two exams. 14 beers later, you have to write your math exam.

Your lucky number is: 16% (your grade and blood alcohol level)

C&O: You start combining all your delicious Christmas treats into one to optimize your splurging time. It works well until you find that the chemicals in a candy cane should not combine with gingerbread.

Your lucky number is: 1 stomach-pumping experience

CM: You get a new PS3 for Christmas. Unfortunately, you can't use it as part of your supercomputer, because it's a Slim. You have to return it, and become the laughing stock of Future Shop, for rejecting a PS3 as a gift.

Your lucky number is: \$299

CS: You test the effects of swine flu on World of Warcraft while on work term at Blizzard. Unfortunately, neither Horde nor Alliance appreciate getting the swine flu, and with their characters out of commission, they have a lot of spare time on their hands.

Your lucky number is: 11.5 million angry mob members

Eng: During your exams, the pressure gets so intense, you have such intense flashbacks of frosh week. You end up screaming out "Yes Sir, Edcom Sir!" in the middle of your Phys 115 exam.

Your lucky number is: 4 Months of counselling

E: You attempt to further abbreviate your faculty. Unfortunately, nobody likes referring to you as a clicking noise. Your faculty gets forgotten until you pick a new abbreviation.

Your lucky number is: click

Mathsci: You try the age old combinatorics problem of ice cream cones, except this time you try it with alcohol. As you are a scientist, you know that the more alcohol you put in a single glass, the more effective it is. Luckily for you, you've simplified your combinatorics problem to only have one solution, a very drunken one.

Your lucky number is: 84%

OR: OR what? Bring it on Operations Research. You decide to remove the conjunction OR from all assignments. You lose all options, and your multiple choice exams become much more troublesome.

Your lucky number is: the numbers 4 through to an arbitrary constant

PMath: You design a robot to test out travelling salesmen theories, and realize that you make more money doing this than being a pure mathematician. You become a billionaire minutes before you wake up.

Your lucky number is: 2 hours of sleep a night

Sci: You discover the ingredients for intelligent lifeforms and find out that sugar, spice, and everything nice is an adequate basis for life. Unfortunately, it's also the basis of your mother's pumpkin muffins.

Your lucky number is: 11 muffin insurgencies

Soft Eng: When you get to your exam, you forget how to write in English. Don't forget to add a "CORRECT=true" tag to your Soft Eng Markup Language (SEML) answers.

Your lucky number is: 7. What, 7 obviously is a lucky number!

Stats: You calculate the percentage of people who are terrorists and bought Modern Warfare 2. You tell the American government, and are caught up in a conspiracy so big, Dan Brown won't even write a novel about it.

Your lucky number is: a few grams of anti-matter

Undeclared: You finally declare! Just kidding. The only way you guys are going to declare is if you get all the credits for a major.

Your lucky number is: 20 Course Units

Tbor

InsidED Is Not To Be Trusted

(If that is his real name)

In a recent *mathNEWS* article, InsidED wrote claiming to have a "non-partisan perspective" but recent information has come to light, showing that not only is he biased, but actually has his own opinions.

If he is willing to lie about something as unimportant as an election, then what else could he be lying about? After a long investigation, mostly going through people's garbages, I have discovered that *prof*QUOTES are fake. It is just an elaborate rouse to convince students that profs are amusing and trick us to go to class.

As well it was also demonstrated that his claim that Imprint was banned from the *mathNEWS* office was completely false. There is photographic evidence of the Imprints in the office.

Finally the puzzles do not have solutions. They are only there to provide a distraction to students while InsidED implements his hidden agenda.

He must be stopped before its too late. With all these lies and rampant misinformation, there is only one person we can trust, CorruptED. His plan to take over the world has been clear and transparent since the beginning.

[Excuse me, but I, ImpulsED, exist. Please acknowledge that, and come to the understanding that my plan for world destruction is so much more win that CorruptED's plan for simple domination. — ImpulsED]

From a concerned student,
YAS

Big Mak's Extra Juicy Video Game Review

Uncharted 2: Among Thieves was released this past month, and I have finally been able to find time to play a couple hours of this amazingly cinematic game.

The first game was a majestic video-game masterpiece, putting films like *Indiana Jones* and *National Treasure* to shame and hitting the final nail in the coffin for the once-great *Tomb Raider* franchise. Its sequel somehow manages the impossible and brings things up a notch, featuring an awesome train fight sequence and jaw-dropping locales touring the world and voice-acting sequences that make you think that you've been transported into an interactive movie.

As much I don't rate games on presentation on principle (since I'm a Wii owner and gameplay is the only thing most Wii games have going for them), Uncharted 2 completely blows you away. The game even makes the normal gun-fights cinematic, re-including that amazing cover system but adding on many new features, such as the ability to throw grenade while shooting, and making the fist-fights more enjoyable and less of a button-mashing experience. The puzzles remain as grand as ever, with a bunch of head-scratchers that leave even the most experienced puzzle-solver bewildered. Not to worry though, some of these puzzles look so fantastic that staring at them for an extended period of time is never a bad thing

To iterate, this game is awesome. If you have a PS3, you should already own this game or stop what you're doing right now and get it. If you are unfortunate enough not to own a PS3, do what I've done and become close friends with a PS3 owner and rent the game. Feel free to break up the friendship as soon as the end credits roll.

Big Mak

Signs

You should be running NOW

November is over, and with it the disturbing string of omens have finished. For those who haven't been observant, this month has carried 4 of the 5 omens fortelling the end of the world as we know it. These omens include:

- Imprint actually doing something right and printing that insert two weeks back about the events in the waterloo area. I hope that that becomes a regular feature.
- Microsoft not goofing up spectacularly in the past few weeks. Windows 7 is a success, and Zune HD is actually cool. Cool fact: if the Zune's processors were any smaller, there wouldn't be enough electrons for the compenents to work. Right now the wires can carry 12 electrons at a time.
- New Moon smashed the Dark Knight's Box office records. And by smashed, I mean blew it out of the water by a good 5 million dollars. 5 million!
- The Maple Leafs actually won a game.

Go. Take cover now. 2012 has nothing on this.

Big Mak

Zombies! FLEE!

Ok, so you may not have heard anyone screaming the title of this article recently, but it's only a matter of time. For your benefit, I have included a list of buildings with an analysis of how safe you would be hiding in them during the zombie apocalypse.

SLC: Are you kidding me? All the glass windows, and the abundance of doors and random rooms to hide in would not only make this an extremely horrible refuge from the zombie hordes, it would also make it hard to clean out. Even if you think you can't live without your daily coffee, if you run in here, you won't live at all.

MC: With small windows, and only five ground level doors, this building might prove to be somewhat defensible. on the other hand, if any zombies did get in, we'd be finding them in the sixth floor for the next few years. On the other hand, nobody would notice.

DC: I don't suppose you've seen the huge panes of glass, the AUTOMATIC doors, and the bridges to at least 3 other buildings. See the rant for the SLC.

DPL: It has a moat, it has a commanding view of campus, and it has small windows. Downsides include the large panes of glass on the first floor, and the automatic doors, but if one shut down the elevators, and guarded the stairwells, one could hold out here for a long while.

NH: Despite the number of stairs in here, the number of entrances and hallways would make this hard to defend and hard to clear out once infected. Plus unless you've just gotten your wheelchair up to the disabilities office, or the hordes are invading from the east, you could probably book it into DPL quickly enough.

V1: Assuming we aren't dealing with genius superzombies, I doubt they'd even be able to find their way into V1, let alone infect it. Assuming enough of the residents have shotguns, it might be alright as a final stronghold. The number of doors, and the mazelike layout might prove a downside however.

RCH: With eight different doors, several staircases connecting floors in strange places, and the general connectedness RCH with two other buildings via tunnels, this place isn't all that great for surviving the zombie apocalypse. It may be good at blocking out cell phone reception and alien brain waves, but you're going to be dealing with waves of the undead if you try hiding here.

ALH: We're not sure whether or not this building has already been taken over by the moaning undead, or if the artsies have hangovers again. I'd avoid going in here on general principle.

QNC:Detailed analysis of the pseudobuilding formerly known as The Pit has been swallowed into a quantum tunnel connecting everywhere to everywhere else. This infinite number of entrances and the lack of walls may render this as not a very good choice, even as a last resort. Try the MC instead.

The Other Tree

profQUOTES

Computer Science was powerful, then Finance was powerful, now nobody is powerful because we're in a recession.

Csima, PMATH 330

That's what many people hoped this course will be like: I teach you some simple algorithms and you do it... those people are no longer here.

Csima, PMATH 330

No matter what you do, you're going to lose the game.

Csima, PMATH 432

The problem with random numbers is that they're kind of random.

Forsyth, CS 371

I'm a living dynamical system.

Zorzitto, AMATH 331

...the particle can't just sit there and say "gee, I don't know what to do".

Zorzitto, AMATH 331

When learning a language, you have to learn how to say "no", otherwise you'll have to say "yes" all the time.

Kim, KOREA 101R

[after talking about genetics and evolution] but I'm no biology professor. I'm better.

Orchard, CS 370

So you see the theme here, I like 'degenerative' random variables, I like 'Slutsky's' theorem...

Struthers, STAT 330

You might remember Venn diagrams from STAT 230 ... or grade 4.

Vanderburg, PMATH 340

I checked your textbook for a proof and it said that we've done enough examples for it to be plausible. Must have been written by engineers.

Vanderburg, PMATH 340

The number of unemployed people doesn't count people living in their parents' basement 'finding themselves'.

Sen, ECON 341

Prof: I don't know any Greek letters besides alpha, beta and gamma, so anything I don't know I just call gamma".

Student: What's that Jesus fish thing on the board?

Prof: You mean alpha?

Doyle, ECON 401

Some professors tell you that there are no stupid questions. That's a lie, there are lots of stupid questions.

Doyle, ECON 401

During my undergrad I was basically a pothead with no pot.

Doyle, ECON 401

I love picking up chicks! I can't wait!

Hartling, SPCOM 223

We may not agree on much in this course, but the one thing we can agree on is I'm not god.

Doyle, ECON 401

You don't want to get what you deserve all the time, because you usually deserve a beating.

Doyle, ECON 401

I'm going to do the proof in 2-space because that way I can draw a picture.

Doyle, ECON 401

This isn't some mysterious math ninja trick.

Doyle, ECON 401

(microphone dies) "Hmm... I lost my voice.

Chou, CHE 102

Don't ask me how the Arrhenius Law is derived. Ask him. Actually, I think he's dead.

Chou, CHE 102

(after course evaluations) I hope you enjoyed your revenge...

Wu, MATH 115

(Prof: Have you had enough?

Students: Yes.

Prof: I don't think so.

Wu, MATH 115

Have any questions about anything? Life? Need counseling advice?

Dupont, MATH 117

I'm not going to try to write all the integrals possible, but your textbook does that.

Dupont, MATH 117

Yeah, there's a group of gnomes that are working feverishly to get new integrals out for Christmas.

Dupont, MATH 117

Try it out, if you get the right answer, I'll friend you on Facebook... actually not really.

Dupont, MATH 117

What's the antiderivative of that? Anyone? I have cookies.

Dupont, MATH 117

I wish I had a tuba player accompanying me everywhere.

Dupont, MATH 117

When I said that the questions on the final were straightforward, I meant that it wouldn't be like "There is a mixing tank with wind blowing at it and a donkey kicking it. Find how much sweat the donkey gives off."

Dupont, MATH 117

This is not Harry Potter's wizard class.

Bizheva, PHYS 115

profQUOTES

I know that figure skating is not in your curriculum, but it's fun.
Bizheva, PHYS 115

This very pretty skater can be represented as this cylinder..
Bizheva, PHYS 115

Prof: Anyone want to explain why this is causing the chair to rotate?
Student: Magic.
Bizheva, PHYS 115

$\sin(x)$ doesn't really grow. It grows one way, and then... it grows the other way?
Clarke, CS 137

Uh oh, who said 'What's the point?' This is a math class! It's just cool!
Clarke, CS 137

If you write a question for the final and send it in to me and I put it on the exam, you'll know how to answer it - or at least I hope so.
Clarke, CS 137

Cool. Not only does it do the wrong thing, it erases your data.
Clarke, CS 137

Sometimes I actually get code to work, believe it or not.
Clarke, CS 137

You can make an educated guess like 'it's over there under that rug'.
Godfrey, CS 137

Phonebooks. Do you remember those? It's a huge book you get every year with people's names and numbers in it.
Godfrey, CS 137

The language spec says 'There be dragons'.
Godfrey, CS 137

We can nail it in place. Or nail it to its perch, as they'd say in a pet shop about a dead parrot.
Godfrey, CS 137

There's a famous quote - which I made up - 'The price of C is eternal vigilance'.
Godfrey, CS 137

'Civil' here means 'not criminal'. Actually, I'm not quite sure what it means.
Morton, SE 101

The judge decided that the manufacturer should have ensured that their drinks did not contain decomposed snails.
Morton, SE 101

You can't sign a contract with your buddy to rob a bank and then sue him for not helping you.
Morton, SE 101

No humans mark these tests. We use apes.
Forrest, PHYS 111

Math is magic! Why pull a rabbit out of a hat when you can pull a vector out of a field?

Anonymous

In the 1600's, Newton was watching a Leafs game, and they were losing as usual so he sat outside under an apple tree.

Forrest, PHYS 111

Now we play a game on children's television called "One of these graphs is not like the others".

Jao, MATH 239

I'll put a Greek letter here because you always put a Greek letter when you don't know what to do.

Jao, MATH 239

The Math of Love

Where Randall Munroe failed, I have succeeded

$\sin(<3) = \text{sex}$ — This is axiomatic

$\cos(<3) = (1 - \sin^2(<3))^{1/2}$
 $= ((1 + \sin(<3))(1 - \sin(<3)))^{1/2}$ One without sex is a virgin. Sex with only one is masturbation
 $= ((\text{virgin})(\text{masturbation}))^{1/2}$ The root of a virgin masturbating is
 $= \text{Sexual Frustration}$

$\tan(<3) = \sin(<3)/\cos(<3)$
 $= (\text{sex}) / (\text{sexual frustration})$ The inverse of sexual frustration is
 $= \text{sex}(\text{promiscuity})$
 $= \text{Sexually Transmitted Diseases}$

$\text{integral}(<3) = \text{The bed}$ — What is under the curve of love is the bed

$(<3)^{1/2} = \text{Lust}$

I look forward to continuing this foray into abstract pseudo-math next term.

— theNewGuy —

A New Disease Plagues Waterloo

In light of the recent outbreak of H1N1, a new type of virus has been spreading amongst Waterloo students, Examitis. This virus seems to only effect university students in waves every four months from the beginning of the year onward. Symptoms are easy to notice and may include exhaustion, frustration, an increased sense of fear, either increased or decreased appetite, heightened desires for distraction, an appearance of dismay, and a sensitive bladder. Doctors have been looking for ways to cure examitis, but have yet to discover anything of use. At the moment, the only method of reducing symptoms seems to a proper diet of food, adequate water intake, at least 8 hours of sleep a day, and a healthy dose of studying. Symptoms only seem to last for a maximum of 3 weeks, except in rare cases. If you are feeling the symptoms of Examitis, just remember that they will eventually go away.

Mooshoo

Interesting Math

Sums of Squares of Consecutive Integers

A couple issues ago, I posed the following question:

We know $3^2 + 4^2 = 5^2$; notice 3, 4, 5 is consecutive and there is 1 more term on the left. Can we extend this idea? In particular, does there exist $n + 1$ consecutive positive integers whose squares sum to the sum of squares of the next n consecutive integers?

This will be a more technical article than usual, but it is such an interesting problem I decided to go over it. If you tried this out, you might have discovered that it certainly holds for $n = 2$ as well, since $10^2 + 11^2 + 12^2 = 13^2 + 14^2$. To solve this problem in general, we want to solve for a such that

$$\sum_{i=0}^n (i+a)^2 = \sum_{i=n+1}^{2n} (i+a)^2 = \sum_{i=0}^{2n} (i+a)^2 - \sum_{i=0}^n (i+a)^2,$$

where I have rewritten the sum on the right to make it the difference between “full” sums starting from 0. Rearranging and expanding the squares, this is simply

$$2 \sum_{i=0}^n i^2 + 4a \sum_{i=0}^n i + 2a^2(n+1) = \sum_{i=0}^{2n} i^2 - \sum_{i=0}^n i^2 = \sum_{i=0}^n i^2 (2n+1):$$

You may recall (or rederive) the formulae for sums of consecutive integers or consecutive squares:

$$\sum_{i=0}^n i = \frac{1}{2}n(n+1)$$

$$\sum_{i=0}^n i^2 = \frac{1}{6}n(n+1)(2n+1).$$

After substituting and simplifying, we end up with

$$x^2 - 2n^2a - (n^2 + 2n^3) = 0,$$

which is a quadratic in a . Solving, we find two solutions: $a = -n$ and $a = n(2n+1)$. The first solution makes sense, since we will have $-n, -n+1, \dots, 0$ as the first $n+1$ consecutive integers, which trivially has sum of squares equal to the sum of squares of the next n consecutive integers. Since I wanted positive integers, the second solution will answer the problem. This is quite an interesting result: for any n , there exist $n+1$ consecutive positive integers whose squares sum to the sum of squares of the next n consecutive integers!

Can we extend this result to higher powers? For example, $3^3 + 4^3 + 5^3 = 6^3$. Then in general, does there exist $n+2$ consecutive positive integers whose cubes sum to the sum of cubes of the next n consecutive integers? Unfortunately, this is not true. The result fails for the next value of n , $n = 2$. Indeed, suppose there is an integer a with

$$x^3 + (a+1)^3 + (a+2)^3 + (a+3)^3 = (a+4)^3 + (a+5)^3,$$

Then this equation holds in every modulus, in particular, in mod 4. However, the first two terms cancel in mod 4, leaving the sum of two consecutive cubes is 0 in mod 4, which never happens (the sum of consecutive powers in mod 4 is either 1 or -1, for any positive power). Oh well, we tried. Maybe there's another generalization to be found — but that's an article for another time.

Vince's problem of the issue

Let S be the set of integers n such that some factorization of n into factors a_1, \dots, a_n satisfy $a_1 + \dots + a_n = 2009$. What is the maximum element of S ?

Vince Chan

v2chan@math.uwaterloo.ca

mathNEWSmailBAG

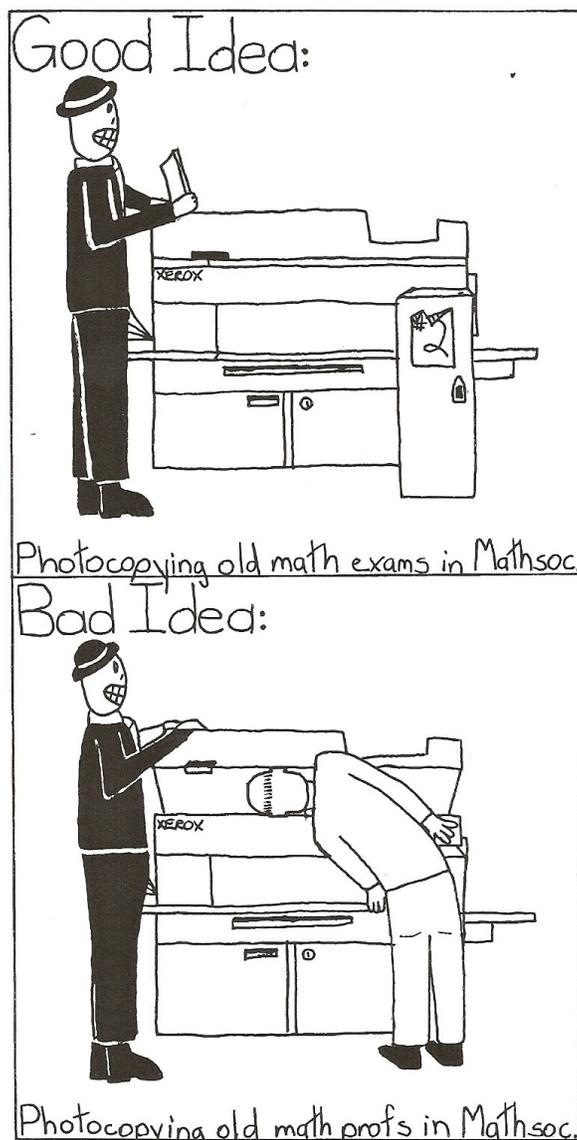
Dear mathNEWS: Loved Good Idea Bad Idea. Please continue these.

TS

Dear TS: Gladly! Your wish is our command!

mathNEWS

It's time for another Good Idea/Bad Idea



THE END

Panda's Pokémon Pilgrimage

The Week that Wasn't

Due to unforeseen circumstances, I've been unable to play these past two weeks (Damn you, Dynasty Warriors and friends!). Rest assured I will finish the team building and take on Stadium 2 over the Christmas break! For great justice!

By the way, I tried the Gym Leader castle, and Zapdos destroyed the first gym hands down. I'm thinking I'll take the team to the Tower Cups, in particular Prime Cup when I'm done training. Hooray!

Pokétrainer Panda

Article of the issue

Because somebody has to get a gift certificate

Last issue of the term, and it was quite a doozy! As you may have noticed *mathNEWS* this week is exceptionally thick, in part thanks to Thor's somewhat massive argument for why Scheme is good because functional programming is love. But the other reason we're so massive is because we had such a great crop of contributors this week, and tons of articles = big *mathNEWS*.

Since we had such a huge number of articles it was especially difficult to decide who to vote as best article, especially because I didn't write an article when we voted (Just kidding, I suck. :D) While we all liked the "InsidED cannot be trusted article," We voted 3 For- 1 Not present to vote for the "The Math of Love" article. It was funny, it referenced XKCD, and it was conveniently sized for layout purposes.

Anyway, to -The New Guy-, you can pick up your Gift Certificate at *mathNEWS*, and we expect more writing of this caliber because we're too lazy to come up with funny stuff on our own.

As always, thanks for reading, and you too could win Article of the Issue by contributing to your beloved *mathNEWS*. It's easy, just mail us a plaintext (Or properly marked up article if you really and truly want some pizza) to mathnews@student.math.uwaterloo.ca with "article" in the subject, or drop it in the **BLACK BOX** between the comfy and the C&D. You could also join us for production nights every other week once next term starts up. I promise, we're all nice people, and since I'm working in Waterloo for my co-op term I'll totally be around to welcome any new writers.

Either way, thanks for reading, and have a great holiday season!

CorruptedED

Drywaller

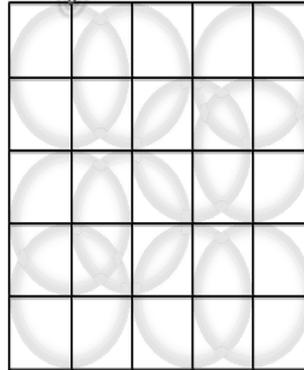
"Listen up. Our client isn't picky, as long as each square has the right number of walls surrounding it. Sounds a little tricky, but we didn't get to be the #3 drywall outfit in town by being lazy."

Also:

- There's a wall around the outside
- They want exactly 14 rooms

2	2	2	3	3	2	2	2	3	4
2	2	1	1	2	3	3	2	1	2
2	1	0	1	3	2	3	4	2	2
3	1	0	2	3	2	2	2	2	2
3	1	1	2	1	1	1	1	2	2
3	2	2	1	0	0	0	0	1	2
3	2	2	1	0	0	0	0	1	2
2	2	2	1	0	0	0	0	1	2
1	2	3	1	0	0	0	0	1	3
2	2	3	2	1	1	1	1	2	4

Puzzles Courtesy euri.ca



Place the following 10 squares on the 10 circles so that the overlapping numbers match up.

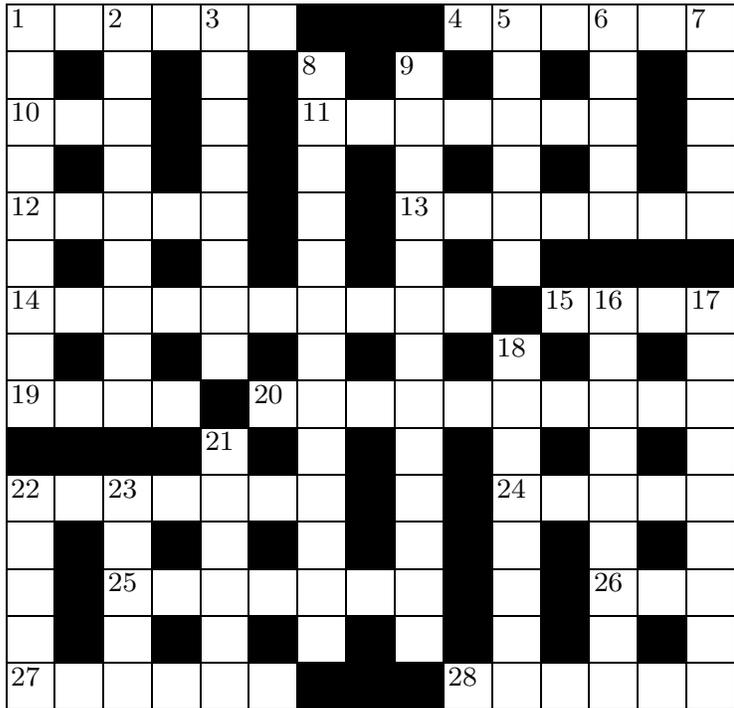
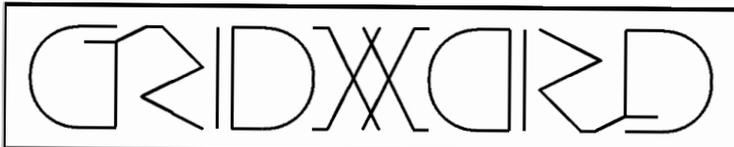
00	00	37	73
97	29	37	33
59	78	16	82
78	75	82	03
57	63		
23	20		

Solution to Previous gridWORD

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

Solution to This week's gridWORD (no peeking)

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



Subscriptions!

It's mathNEWS, the home game

Yes, really, we have subscriptions. If you aren't going to be around campus to get issues of *mathNEWS*, then why not have them delivered to you? You can take them to work and read them during meetings. Or you can read them during those long commutes. Or during meetings!

Of course there is the webpage, but there's a lot less glare off bond paper, and you get to see our wacky filler and comics! And *mathNEWS* can travel almost everywhere, unlike those clunky computers with their cables and such. Unless you have a laptop, but what are the odds of that? One in fifteen?

And, let's not forget, they're pretty cheap too! In Canada, it's \$7.50 a term, twenty bucks for three terms. For the States, it's \$10 a term, and twenty-five for three. The rest of the world pays \$15 a term or \$35 for three.

A term's subscription gets you all six exciting issues, plus any bonus issues that happen to come out. But what are the odds of that? Two out of three?

The three-term option means you can get *mathNEWS* every summer you're away, or, for those co-ops out there, you can have your subscriptions every time you go off to a faraway job. Any three terms are do-able.

To subscribe, just drop by the *mathNEWS* Office (MC 3046) with your requested term(s) and some cash (or a cheque), or drop it in our mail slot in the MathSoc Office (MC 3038), or put it in the **BLACK BOX** outside of Comfy, or email mathnews@student.math.uwaterloo.ca, or give your money to a mathie in the hopes he or she is an editor. But what are the odds of that? One in one thousand five hundred?

Here's a handy-dandy form to make your requesting process even easier:

Grid Clues

Across

1. Pail
4. Slice of bacon
10. Possess
11. Animal skin material
12. Hillock
13. Burnt sugar
14. Preciseness
15. Canadian golfer Stephen
19. Sketched
20. Give off bubbles
22. Card game
24. River nymph
25. Pouch-billed bird
26. Raptors' league
27. Serious
28. Educe

Down

1. Stupid person
2. Barrage
3. Drain of colour
5. Stick fast
6. Women's quarters
7. Competitor
8. Pipe dream (3)
9. Salad flavouring (2)
16. With complex, a narcissistic disorder
17. Unwavering
18. Momentous
21. Place for lunatics
22. Without refinement
23. Kathmandu country

gridCOMMENTS

The last two grids for this volume provide an interesting juxtaposition in my grid file. The previous grid had 47 numbered squares which is the most this term. This week's grid on the other hand has the fewest, with only 28. That may have something to do with the number of long words showing up in this grid. Hopefully, it will provide sufficient challenge to entertain you.

Last issue's grid was rather capsicum-laced and we had several submissions. The winner was George Li who submitted a correct solution and answered, "A raccoon corpse with tire tracks on it." Really, I'm surprised that they didn't make that into a Pok?mon already given how bad an idea it is. So, you can collect your prize from the MathSoc office.

Alas, as this is the last week of the term, there are no prizes for submitting this issue's grid. To keep you happy though, you can check your answers against the solution somewhere in the issue. No peeking until you complete the grid.

perki

Subscribe! You know you want to! What else are you going to do on Co-op, work?

mathNEWS Subscription Form

Name: _____

Mailing Address: _____

Terms Requested:

1. F W S 20__ 2. F W S 20__ 3. F W S 20__

Canada: \$7.50/term, \$20/year

USA: \$10/term, \$25/year

Overseas: \$15/term, \$35/year

Make cheques payable to *mathNEWS*