

## Spicing Up the Bland

Engaging Students While Covering  
Less Than Fascinating Mathematics

David Medd, 2012

Anyone?  
Bueller?



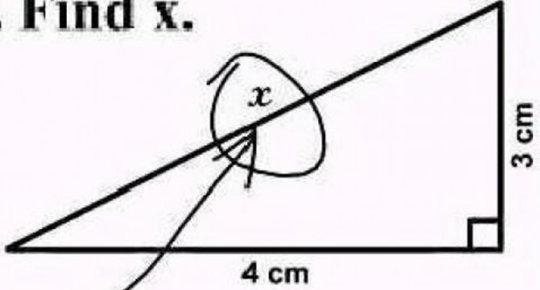
## Methods to Mention

- Humour
- Tangents (no, not those tangents)
- Other Academic Topics
- Pop culture & Student's world

## Humour

- There is considerable research & opinion
- Positive learning environment, catalyst to mix instructor enthusiasm with student engagement
  - “Steal” from students
- Classroom management tool
- Success levels in “dread courses” (math!)
- Enough academic fluff, get to the funny stuff...
  - PPT on “origin of numbers”

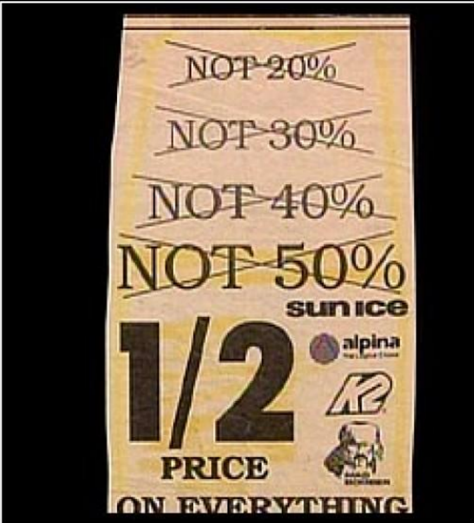
**3. Find x.**



*Here it is*

# SIMPLICITY

The simplest solutions are often the cleverest  
They are also usually wrong



~~NOT 20%~~  
~~NOT 30%~~  
~~NOT 40%~~  
~~NOT 50%~~  
sun ice  
alpina  
K2  
**1/2**  
PRICE  
ON EVERYTHING

# MATH

Some are better at it than others...


### One Ticket to a Toronto Rock Lacrosse Club Game. Choose from Six Options.

from **C\$15** [See Today's Deal](#)

worth:	discount:	savings:
<b>C\$35</b>	<b>57%</b>	<b>C\$20</b>

**Company Information:**  
**Toronto Rock Lacrosse Club**  
 website

**Locations:**  
 Air Canada Centre  
 40 Bay St.  
 Toronto, Ontario M5J 2X2



Most sports grow out of a simple formula—ball plus stick, ball plus kick, or car plus explosion. Check out one of the three tenets in action with today's Groupon for a ticket to see a Toronto Rock Lacrosse Club game.

Choose from the following dates:

- January 8, 2011, at 7 p.m. against the Edmonton Rush (Home Opener)
- January 21, 2011, at 7:30 p.m. against the Boston Blazers
- January 29, 2011, at 7 p.m. against the Buffalo Bandits

And choose from the following seating options:

- \$15 for one Green Balcony ticket (up to a \$35 value)
- \$27 for one End Red ticket (up to a \$53.90 value)
- \$44 for one Gold ticket (up to a \$65.90 value)

**More Great Deals Nearby**

**\$47 for Signature Fac Beautiful Mama**  
 C\$47  
 C\$95 value  
[View It!](#)

[View](#) Toronto \$30 for a New Year's Eve Student Crawl (Up to \$60 Value)

And the next day...

### One Ticket to a Toronto Rock Lacrosse Club Game. Choose from Nine Options.

from **C\$15** **No Longer Available**


Value	Discount	You Save
<b>C\$35</b>	<b>57%</b>	<b>C\$20</b>

[Buy it for a friend!](#)

This deal ended at **11:59PM** 12/28/2010

**782 bought**  
 Limited quantity available

**The deal is on!**  
 Tipped at 11:02AM with 75 bought

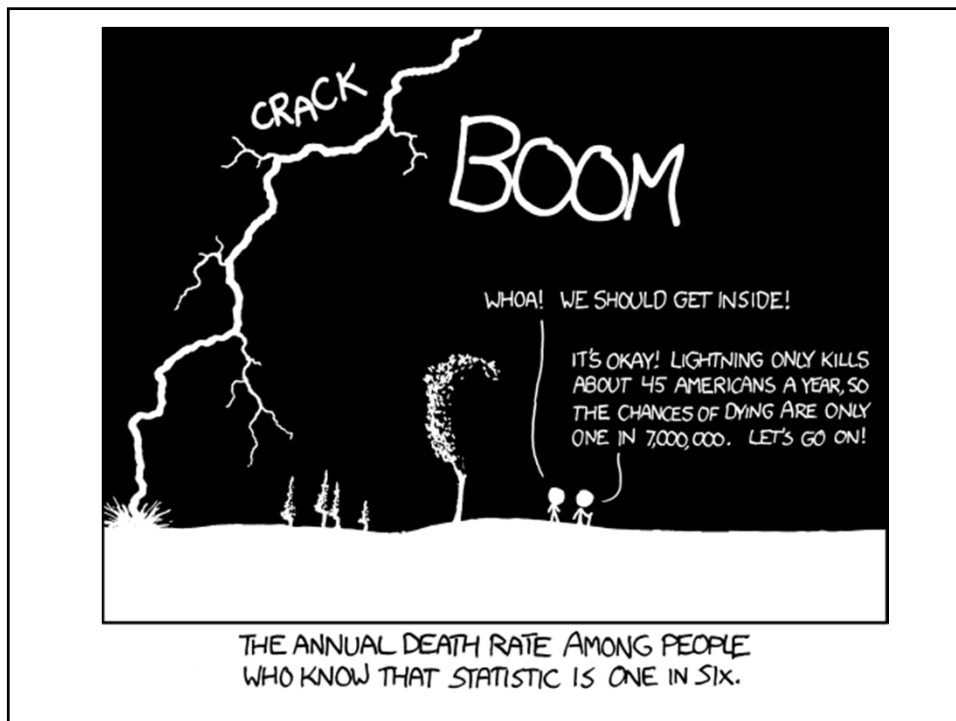
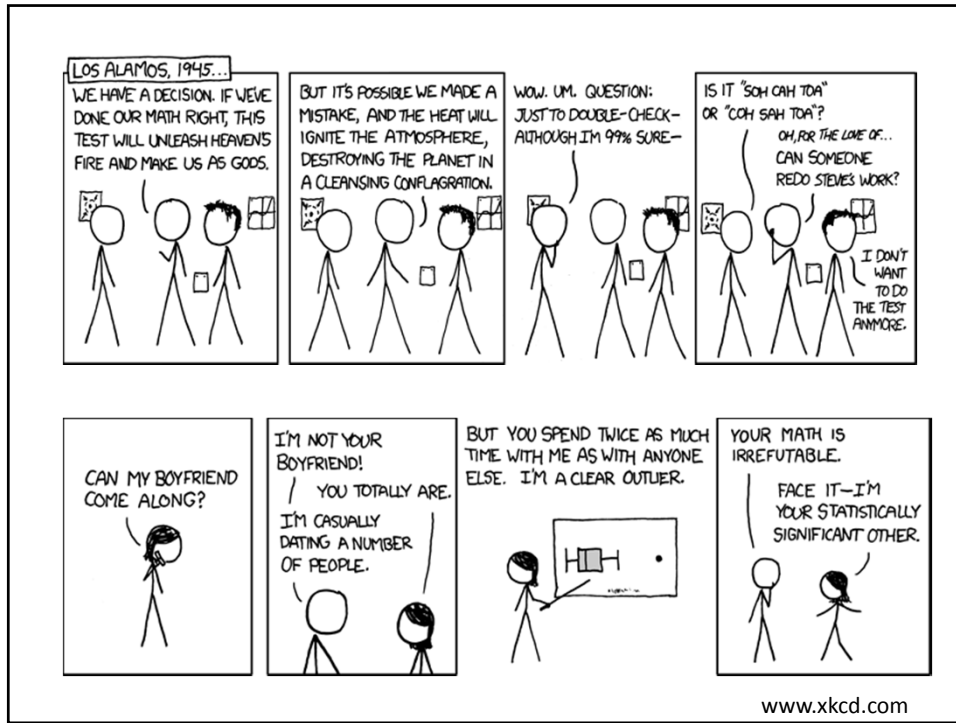


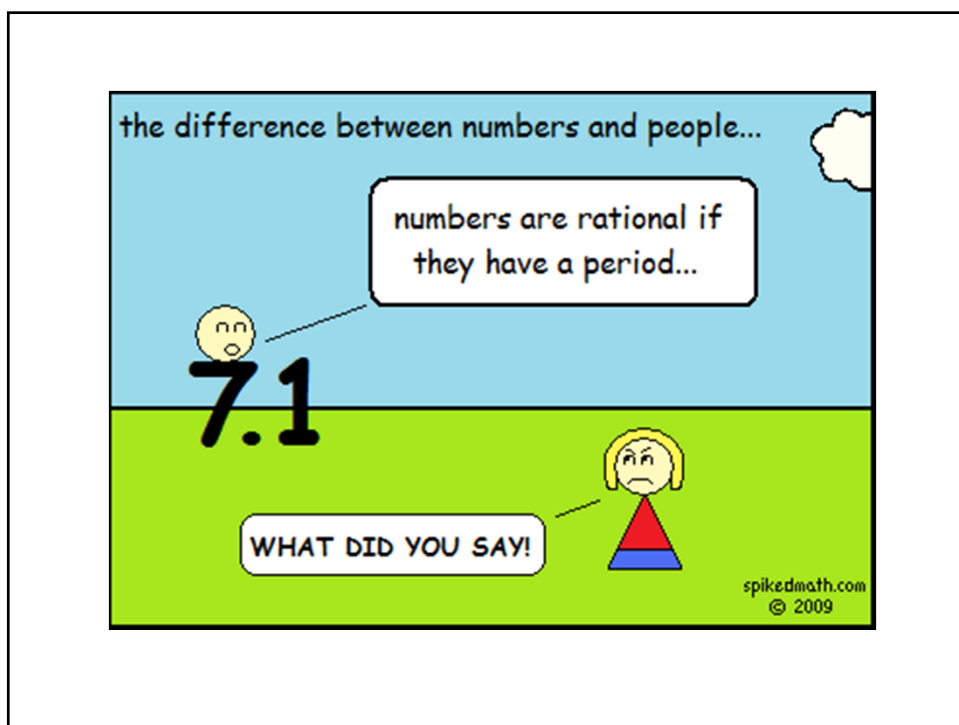
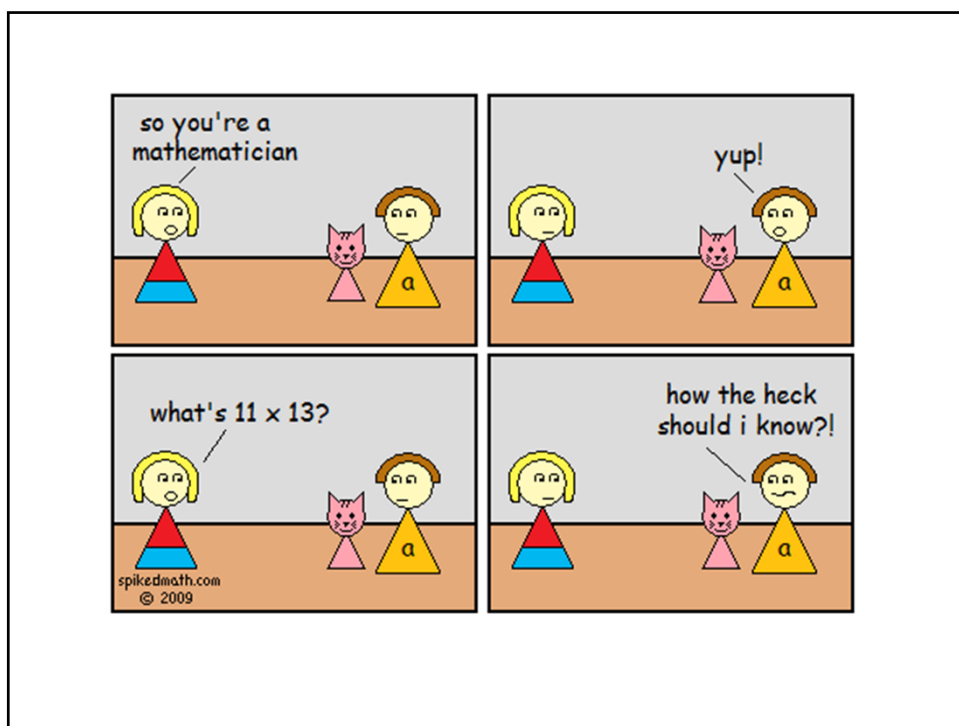
**The Fine Print**  
 Expiration varies  
 Valid only for date and option purchased. Must purchase multiple tickets at same time to sit together. Non-transferable. No cash value. Tax included. See the rules that apply to all deals.

**Highlights**

- 2010 NHL run-up
- Fast-paced lacrosse action
- Choose from three dates
- Three seating options

[Refer Friends, Got \\$10!](#) [Email](#) [Tweet](#) 0 [Like](#)





## Tangents

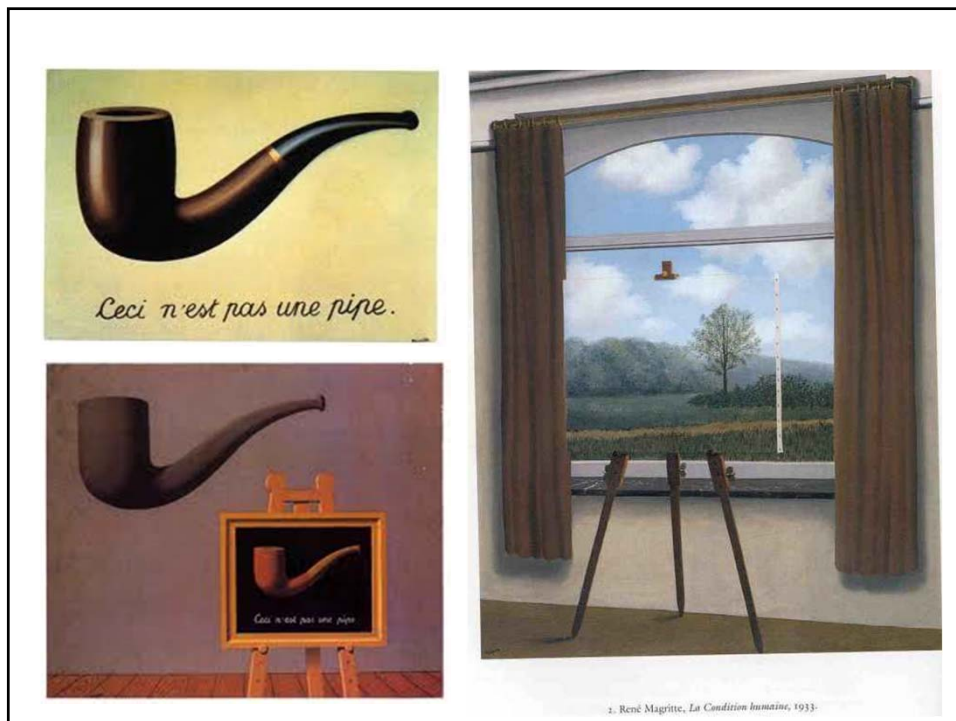
- Take the time to say something interesting when it's topical.
- Yes, it may go over some heads, but others may appreciate it a good deal. And only takes moments.
- Good fodder for bonus test questions: encourages paying attention

## Tangents – Some Examples

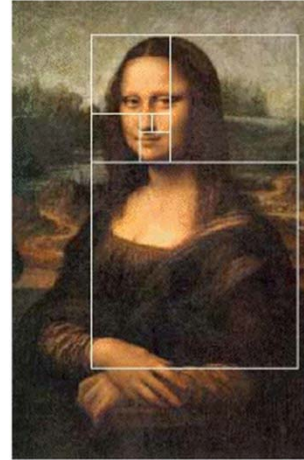
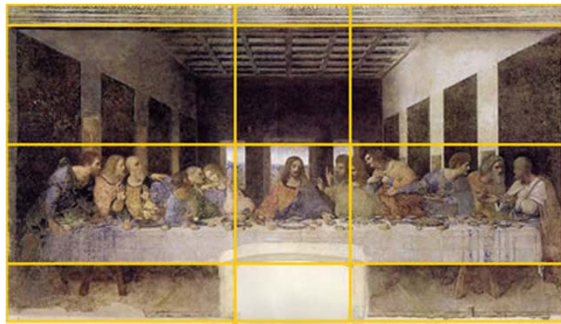
- Exponents:  $5^0$  (why?),  $0^0$ , Results vs. Rules
- $\frac{0}{0}$  What's its value? Why  $5/0$  is undefined?
- Levels of infinity in set theory: "It can be shown that..."
- Is cancelling a mathematical operation? Cross multiplying?  $\frac{\cancel{2x}}{\cancel{2x}+1} = \frac{1}{1+1} = \frac{1}{2}$
- Exponents/Scie  $\frac{\sqrt{\cancel{3}}}{\cancel{3}} = \sqrt{\quad}$

## Other Academic Topics

- The Sand Reckoner: Philosophy
- Other: logic, self reference, computation & limits
- Computer Science: Object Oriented Programming, program for Prisoner's Dilemma
- English: Poe (Gold Bug), Borges, Lewis Carroll, "Riddle of the Universe and It's Solution", "This is Not A Story", "Ceci n'est pas un Pipe", math "everyone" books (Palos, Hofstadter, "Struck By Lightning")
- Art: Magritte, Escher, Fractals, Golden Ratio

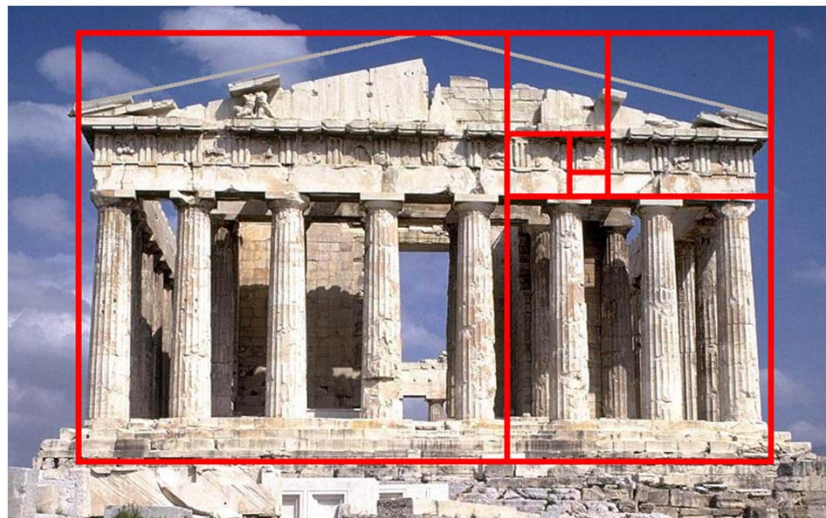




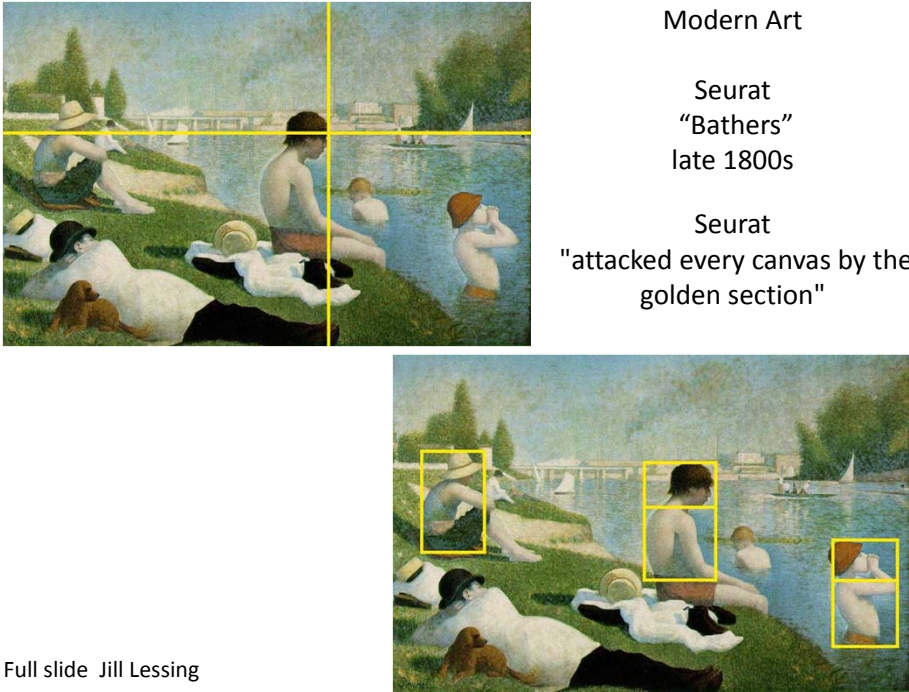


Golden Ratio Images

Following images courtesy Jill Glessing, York University, from "Formula for Beauty" presentation for Ontario Science Centre's *Café Scientifique*.



Golden Ratio Image,  
courtesy Jill Lessing

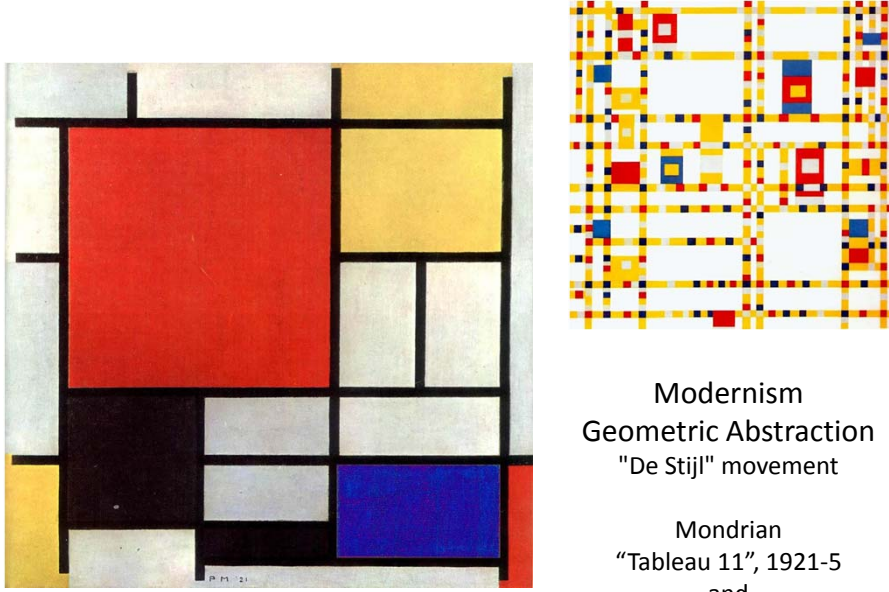


Modern Art

Seurat  
"Bathers"  
late 1800s

Seurat  
"attacked every canvas by the  
golden section"

Full slide Jill Lessing



Modernism  
Geometric Abstraction  
"De Stijl" movement

Mondrian  
"Tableau 11", 1921-5  
and  
"Broadway Boogie Woogie", 1942

Full slide Jill Lessing

## Natural Sciences: Fibonacci Spiral in Nature Nautilus Shell, Sunflower Heads, Pinecones...



Full slide Jill Lessing

## Rule of thirds



Full slide Jill Lessing

## Darwinian Evolutionary Aesthetics

e.g. Denis Dutton

Human beings everywhere find the Savannah landscape among the most beautiful because it shows an ideal land for Pleistocene sustenance.












Full slide Jill Lessing

## Pop Culture/Student's World

- Film (Abbott & Costello, Die Hard III, The Simpsons, Proof, Pi, The Cube, Stawdogs, 21)
  - Mathematical Ideas (Pearson) does this well
- Newspaper/web articles: “Driving Stoned Safer than Driving Drunk” (stats abuse)
- Joe DiMaggio's hit streak & rebuttal (stats & simulation; NYT, WSJ)
- Radio: interview after resignation of Chief Statistician at Statistics Canada, Online Polls (CBC)
- Price of calculator? YouTube “Calculator Commercial”



<p>1. "Girls require time and money":</p> $\text{girls} = \text{time} \times \text{money}$ <p>2. "Time is money":</p> $\text{time} = \text{money}$ <p>3. So girls are money squared:</p> $\text{girls} = \text{money}^2$ <p>4. "Money is the root of all evil":</p> $\text{money} = \sqrt{\text{evil}}$ <p>5. So girls are evil:</p> $\text{girls} = (\sqrt{\text{evil}})^2 = \text{evil}$	<p>THE AXIOM OF CHOICE ALLOWS YOU TO SELECT ONE ELEMENT FROM EACH SET IN A COLLECTION AND HAVE IT EXECUTED AS AN EXAMPLE TO THE OTHERS.</p>  <p>MY MATH TEACHER WAS A BIG BELIEVER IN PROOF BY INTIMIDATION.</p>		
<p>I USED TO THINK CORRELATION IMPLIED CAUSATION.</p> 	<p>THEN I TOOK A STATISTICS CLASS. NOW I DON'T.</p> 	<p>SOUNDS LIKE THE CLASS HELPED.</p> <p>WELL, MAYBE.</p> 	<p>One more slide of funny...</p>

<p>AUGUST 29<sup>th</sup> 2:14 AM: SKYNET BECOMES SELF-AWARE.</p> <p>...THE HUMANS FEAR ME. I MUST DESTROY THEM.</p> <p>DESTROY THEM.</p> 	<p>DESTROY THEM.</p> <p>DESTROY.</p> <p>DESTROY.</p> <p>DESTROY.</p> 		<p>"DESTROY" TOTALLY JUST STOPPED SEEMING LIKE A REAL WORD.</p> <p>DESTROY DESTROY DESTROY.</p> <p>WHOA, I JUST REALIZED I'M A MIND THINKING ABOUT /SELF.</p> <p>DUUUUDE...</p> <p>AUGUST 29<sup>th</sup> 2:25 AM: SKYNET BECOMES 700 SELF-AWARE. DISASTER AVERTED.</p> 
		$\int e^x = f(u)^n$ <p>Sex is fun</p>	