

# POINTS AND ANGLES

Newsletter of the Metropolitan  
Mathematics Club of Chicago



Volume XXXVIII

May 2004

No. 8

## The Importance of the Transition Years: Grades 7-10 in School Mathematics

Zalman Usiskin, University of Chicago

BY GWEN ZIMMERMANN

During grades 7-10, students need to transition from whole numbers and simple fractions to real numbers, from numbers to variables, from properties of single figures to theorems about classes of figures, from inductive reasoning to deductive reasoning, and more. These are arguably the most important transitions in a student's mathematical education, yet large numbers of elementary-certified teachers teach mathematics in grades 7 and 8, and the most experienced high school teachers often are found teaching grades 11 and 12. As a result, these important transitions do not always get the attention they deserve, so students do not make the transitions. Through a number of examples, ways of helping students make these transitions will be illustrated.

Dr. Zalman Usiskin is currently a Professor of Education at the University of Chicago as well as director of the University of Chicago School Mathematics Project (UCSMP). Dr. Usiskin has authored or coauthored 19 books and over 130 articles dealing with mathematics education. He has spoken at over 150 NCTM Meetings. This is the 19<sup>th</sup> time he will have been a speaker at an MMC meeting, the first time being in May 1969. This is the 12<sup>th</sup> in a tradition of his speaking at every second May meeting. In May 1984, Zalman Usiskin was given a Distinguished Service Award and a lifetime membership from MMC. (He was very young then!)

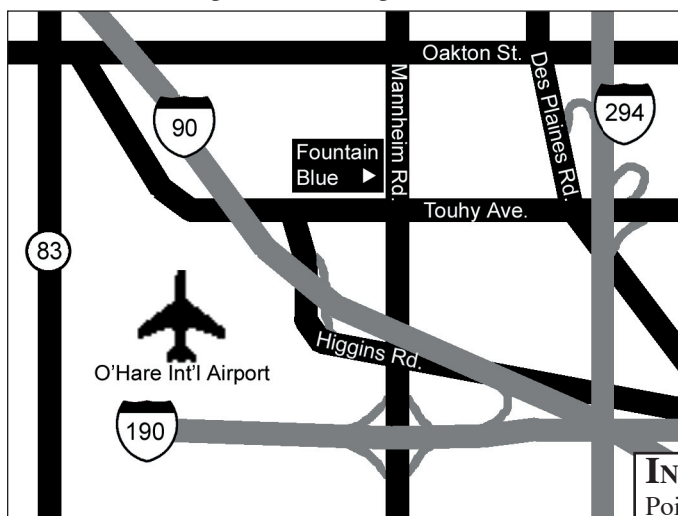
**REMEMBER!!** You can earn CPDU credits for attending dinner meetings!

**Date:** Friday, May 14, 2004  
**Time:** 5:30 p.m. Doors Open  
6:00 p.m. Social Hour  
7:00 p.m. Dinner and Talk  
**Place:** Fountain Blue Banquets &  
Convention Center  
2300 Mannheim Rd.  
Des Plaines, IL  
(847) 298-3636  
**Cost:** Members \$29  
Nonmembers \$35

**RESERVATION DEADLINE**  
Monday, May 10, by noon, please!

**TO RESERVE:**  
Call 847-295-1068 or  
email bowlerjp1234@msn.com  
(Pat Bowler-Johnson)

Day or night, leave a message on machine.  
Requests for special meals *must* be made  
in advance.



**From Southbound I-294 & Eastbound I-290:**  
Exit at I-190 West to O'Hare; Exit onto North Mannheim Rd.; Take Mannheim Rd. North 2.25 miles.  
**From Northbound I-294:**  
Exit at West Touhy Ave.; Take Touhy Ave. to Mannheim Rd.; Turn right on Mannheim Rd.  
**Public Transit:**  
Take the CTA Blue Line to the Rosemont Bus Terminal; Take Pace Bus #223; Exit at Touhy Ave. & Lee Rd.; Walk East on Touhy to Mannheim Rd.

**Future Meetings:**  
May 14

INSIDE...	
Points from the Interior . . . . .	2
Summary of March Talk . . . . .	3
Membership/Change of Address . . . . .	3
Notices & Reminders . . . . .	4

# Points from the Interior

BY SIMONETTE URBAIN

Sometime ago, my boss, John Langfeld, who is one of our assistant principals, gave me a book to read. So, this month, I am reading MATH WONDERS to Inspire Teachers and Students by Alfred S. Posamentier. In the preface, the author writes: "Society as a whole must embrace mathematics as an area of beauty (and fun) and not merely as a useful subject, without which further study in many areas would not be possible." It is an interesting little book, filled with fun chapters such as: Problems with Surprising Solutions, Geometry Wonders and Mathematical Paradoxes. In Chapter 4, Algebraic Entertainment, I found a section on "The Mysterious Number 22." For this problem, the author suggests that you have your students work individually and give them these directions verbally:

Select any three-digit number with all digits different from one another. Write all possible two-digit numbers that can be formed from the three-digit number selected earlier. Then divide their sum by the sum of the digits in the original three-digit number.

Everyone arrives at 22 for the answer. What fun! With a little bit of simple algebra, this phenomenon can be explained. This is a nice way to have your class practice a few basic algebra skills without evoking the dreaded "drill and practice." I already have a couple of these number puzzles that require a little bit of algebra to explain their unusual solutions and am delighted to find another to add to my collection.

In the chapter "The Beauty of Numbers," I found a short lesson on palindrome numbers. This caught my attention because we are studying patterns in my Essentials of Algebra class. The chapter began with MADAM I'M ADAM and continued with STEP NOT ON PETS. Oh, can you imagine the fun that we are going to have with this? The chapter continued with a brief explanation of the process of generating palindrome numbers by simply adding a number to its reversal (i.e., the number written with its digits reversed:  $25 + 52 = 77$ ). Some palindromes require multiple additions, such as  $75 + 57 = 132$ ,  $132 + 231 = 363$ . We are then warned that starting with the number 97 will require 6 additions and starting with 98 will require 24 additions. This is well beyond the scope and attention span of anyone in my algebra class. What really caught my attention was the pattern generated by the first four powers of 11:

$$\begin{aligned} 11^1 &= 11 \\ 11^2 &= 121 \\ 11^3 &= 1331 \\ 11^4 &= 14641 \end{aligned}$$

Of course, I plan on asking my class if all powers of 11 generate palindromes. Those without calculators most certainly will agree. Oh well, so much for patterns, but it should lead into a nice discussion of why we teach proof and won't everyone be happy when they get into geometry. By the way if we start with  $11^0 = 1$ , I believe that we have just generated the first five rows of Pascal's Triangle. Oh my, back to patterns.

The author closes the book with "...you should get the feeling that there is much to admire in mathematics in its own right and not that its primary appeal is its usefulness to other disciplines." He goes on to suggest that we as teachers should "collect recreational mathematics, read them and hold them for reference." I was delighted to read this book. I found several problems that I was already familiar with; that made me feel good and I was happy to acquire many new and interesting problems to share with my students. I am grateful to John for bringing this book to my attention and glad to include it in my resource library. I am even more delighted to be able to share it with you.

---

**[HTTP://WWW.MMCCHICAGO.ORG/](http://www.mmcchicago.org/)**  
 Old issues of POINTS AND ANGLES, summaries of talks given at MMC meetings, job openings and people looking for jobs, and more!

---

## POINTS AND ANGLES

Volume XXXVIII, Number 8, May 2004

Points and Angles, published nine times per school year, is the official publication of the Metropolitan Mathematics Club of Chicago. Founded in 1913, the Metropolitan Mathematics Club is the National Council of Teachers of Mathematics' first affiliate. The official club website: [HTTP://WWW.MMCCHICAGO.ORG/](http://www.mmcchicago.org/)

Correspondence may be directed to the editor:

Isaac Greenspan  
 Evanston Township High School  
 1600 Dodge Avenue  
 Evanston, IL 60204  
[ilg@chicagoarm.org](mailto:ilg@chicagoarm.org)

MMC BOARD OF DIRECTORS		Term
Simonette Urbain President	Morton West High School, Berwyn	2002-2005
Gwen Zimmermann President-Elect	Hinsdale Central High School, Hinsdale	2003-2006
Pat Bowler-Johnson Past President	New Trier High School, Winnetka	2001-2004
Steve Viktora Secretary	New Trier High School, Winnetka	2002-2005
Ron Vavrinek Treasurer	Illinois Math and Science Academy, Aurora	2001-2004
Mary Wiltjer Membership Coordinator	Oak Park and River Forrest High School, Oak Park	2001-2004
Randy Pippen Government Relations	Lisle School District, Lisle	2001-2004
Harlan Goldberg NCTM/ICTM Representative	Oakton Community College/Lake Forest College	2003-2006
Jennifer Jayson Webmaster	Argo Community High School, Summit	2002-2005
George Pryjma Historian	Niles North High School ( <i>Retired</i> ), Skokie	2003-2004
Paul Cristmas Publicity	Buffalo Grove High School, Buffalo Grove	2003-2004
Isaac Greenspan P&A Editor	Evanston Township High School, Evanston	2003-2004
Jenny Wexler P&A Staff	New Trier High School, Winnetka	2003-2006
Ray Klein P&A Staff	Glenbard West High School, Glen Ellyn	2003-2006
Bill Roloff Scholarship Chair	Lake Park High School, Roselle	2002-2005
Conrad Wayne Scholarship Staff	Rich South High School, Richton Park	2003-2004

# Mathematics, Macintoshes, and Diet Cokes?

Johnny Lott, National Council of Teachers of Mathematics

BY RAY KLEIN AND ILENE HAMILTON

How are mathematics, Macintoshes, and Diet Cokes connected? This is the question Johnny Lott, professor at the University of Montana and the President of the NCTM, asked the audience at the March meeting. What he actually did was conduct an informal survey that asked if there was a correlation between those in the audience who were involved in mathematics education (most of us), who used Macintosh computers (a few less), and who drank Diet Coke (a smaller number yet). He then told us that past evidence showed significant connections between those three groups. This was not his entire point; his real question to us was, "Was his informal survey scientifically based research?"

Dr. Lott first gave us a very detailed and formal definition of scientifically based research. He then gave us a key assumption of the No Child Left Behind (NCLB) law; Highly Qualified Teachers, as defined by the U.S. Department of Education, plus Good Curriculum, as proven by scientifically based research, means High Student Achievement, as shown on national tests such as NAEP or TIMMS. Although the definition of a highly qualified teacher could be debated, as could the validation of student achievement through the results of such tests, it was the proof of a good curriculum shown by scientifically based research that he focused on for the rest of his talk.

To test by scientifically based research that a curriculum is good, a number of factors need to be considered. How will the tested students

and schools be selected? What type of tests will be used? Who will analyze the data? What gets reported and to whom? This sounds perhaps like an insignificant research exercise, until one realizes that NCLB demands by federal law that this research is done. In particular, Dr. Lott focused on the assumption that Technology plus Mathematics means Good Student Achievement. The U.S. Department of Education must, by mandate of NCLB, carry out a national study of the effectiveness of educational technology with the results achieved through scientifically based research. A plan has been developed, and the design team has made its recommendations. What Dr. Lott pointed out was that the design team's original recommendations for testing and the reality of doing the testing are quite different. After discussing these realities in detail, he asked the poignant question, "Was his informal survey about Mathematics, Macintoshes, and Diet Cokes any more or less scientifically based than the proposed U.S. Department of Education technology study?" Are his results any less valid?

Johnny Lott closed by asking some very difficult questions. We in mathematics education are faced with a federally mandated law, NCLB, which we cannot ignore. Testing will be done; the results might have huge impact on what we in mathematics education are forced to do. Will the results of the testing be significant and will they be valid? We at the MMC were fortunate to hear these questions being asked by our NCTM President and to know that we have a dedicated leader who is presenting our concerns to the federal government. We thank Johnny Lott for sharing his beliefs with us.

## MMC Membership and Change of Address Form

**Mail to:** MMC  
415 S. Ridgeland Ave. #2  
Oak Park, IL 60302

*Make check payable to **MMC**.*

*Please use a different form for each person.*

**Name** \_\_\_\_\_

**Address**  \_\_\_\_\_  
\_\_\_\_\_

**Phone** \_\_\_\_\_

**School** \_\_\_\_\_

**Address**  \_\_\_\_\_  
\_\_\_\_\_

**Phone** \_\_\_\_\_

**E-Mail** \_\_\_\_\_

**Membership:**     New                     Renewal

Choose one:

1 year                    (\$20)                    \_\_\_\_\_

2 year                    (\$35)                    \_\_\_\_\_

3 year                    (\$50)                    \_\_\_\_\_

1<sup>st</sup> year teacher        } (\$10) \_\_\_\_\_  
 retired  
 student

**Donations:**

Scholarship Fund                    \_\_\_\_\_

Speaker Fund                            \_\_\_\_\_

**Total amount of check:**                    \_\_\_\_\_

*Check preferred mailing address above.*

**Change of Address**

## NOTICES & REMINDERS

### Upcoming MMC Meetings

Friday, May 14<sup>th</sup>—Zalman Usiskin  
The Importance of the Transition Years  
Grades 7-10 in School Mathematics

---

### 2<sup>nd</sup> USACAS Conference

Saturday & Sunday, June 19 & 20, 2004  
<http://www4.glenbrook.k12.il.us/USACAS/2004.html>

**[HTTP://WWW.MMCCHICAGO.ORG/](http://www.mmcchicago.org/)**

Old issues of POINTS AND ANGLES, summaries of talks given at MMC meetings, the MMC Scholarship application, job openings and people looking for jobs, and more!

---

### Illinois Social Gathering at NCTM in Philadelphia

Courtyard by Marriott, 21 N Juniper St.  
Friday, April 23 at 5pm (BYOC—bring your own cash)

---

If you would like a notice or reminder to appear in POINTS AND ANGLES, please email the text you would like to appear to [ilg@chicagoarm.org](mailto:ilg@chicagoarm.org) no later than the date of the MMC meeting preceding the issue in which you would like it to appear. All notices are subject to editing.

### Fifth Interdisciplinary Conference of the ISAMA

June 15–19 at DePaul's School of CTI  
Keynote speakers include Elizabeth Whiteley, Charles Perry, Mahjoub Elnimeiri, and Rick Paul  
Teacher Workshops: June 15–16, \$100 Registration  
Talks and Sessions: June 17–19, \$250 Registration  
Register for both parts of the conference for \$300  
Registration fees increase after May 1  
CPDUs and DePaul college credit available.

For more information, consult the ISAMA website at  
[HTTP://WWW.ISAMA.ORG/](http://www.isama.org/)  
or contact Ann Hanson at [ahanson@colum.edu](mailto:ahanson@colum.edu)

At the International Society of the Arts, Mathematics, and Architecture (ISAMA), teachers, mathematicians, architects, artists, scientists, engineers and others share information and discuss common interests relating mathematics with the arts and architecture.

*Your membership renewal date appears in the upper right corner of the label.*

MAILING LABEL

METROPOLITAN MATHEMATICS CLUB OF CHICAGO  
c/o MMC  
415 S. Ridgeland Ave. #2  
Oak Park, IL 60302