

Taback's Tidbits

Professor Stanley Taback, NYCMP Co-Director, shares mathematics problems with all of us. We hope you enjoy the following selections.

Mathematics teachers know how often their students confuse the notions of perimeter and area. The problems below focus on these two notions in both traditional and novel settings.

1. A square and an equilateral triangle are inscribed in a circle of radius 8. Find the ratio of their perimeters.

2. Consider a sequence of concentric circles of radii $1, 1/2, 1/4, 1/8, 1/16,$ and so on, indefinitely. Naming the respective circumferences as $C_1, C_2, C_3, C_4,$ etc, alternately subtract and add the circumferences and obtain the final result; that is, compute $C_1 - C_2 + C_3 - C_4 + \dots + (-1)^n C_n + \dots$

3. Triangle ABC is a right triangle with integer-valued side lengths for which numerical values of the area and the perimeter are equal. Find the dimensions of all such right triangles.

Humor in a Mathematical Vein

Why did the chicken cross the Mobius strip?
A: To get to the same side.

What keeps a square from moving?
A: Square roots, of course.

What do you get if you divide the circumference of a jack-o-lantern by its diameter?
A: Pumpkin Pi.

Did you know?
Mathematics is made of 50% formulas, 50% proofs, and 50% imagination.

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NEW YORK CITY MATHEMATICS PROJECT



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NEW YORK CITY

MATHEMATICS²S PROJECT

NEWSLETTER

SPRING 2006



ISSUE 4

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Letter from the Director

Suzanne Libfeld

Talk about networking! Not only was mathematics featured prominently at every event of the *2006 Winter Olympics* in Turin, Italy, it is the subject of a television show that airs on Fridays at 10:00 p.m. *NUMB3RS*, created by CBS, focuses on FBI agent Don Eppes (Rob Morrow) and his mathematical genius brother Charlie (David Krumholtz) as they solve crimes in Los Angeles. Based on real cases, the series connects police work with mathematics and presents solutions to compelling problems. CBS discovered that a lot of mathematics teachers began using *NUMB3RS* content as a teaching tool. As of the 2005–2006 season, Texas Instruments and the National Council of Teachers of Mathematics partnered with CBS to develop mathematics education activities for teachers in grades 7–12. These activities, developed by mathematicians and classroom teachers, make mathematics relevant for students and affirm for us—beyond a shadow of a doubt—“math is in.”

The New York City Mathematics Project (NYCMP), a program of the Institute for Literacy Studies at Lehman College/CUNY, has always thought that “math is in” and is thrilled to see some of our values enacted in international contexts. Our model for professional development is based on a commitment to excellence in mathematics education for all students, “real-world” problem solving, and “teachers-teaching-teachers” approaches. Our *15th Annual Conference*, to be held at Lehman College on April 1, 2006, will bring K–12 teachers, college faculty, and other educators together so they can “do the numbers” and help their students understand “why math works.”

In the past year, we’ve been doing some of our own numbers. Data from our most recent external evaluation and surveys of NYCMP program participants show that our impact is significant in schools where NYCMP has had a presence for one or more years. In addition to the work that our consultants provide at school sites and through graduate seminars, study groups, and workshops, we continue to offer support to school leaders. We conducted leadership institutes for principals, assistant principals, coaches, and staff developers in 2005. In 2006, our partnership with Texas Instruments will support *T3-Teacher Leader Cadre*, a five-day teachers-teaching-with-technology institute in August 2006, followed by a four-day program in fall 2006.

This year, NYCMP is providing professional-development services in seven regions of the NYC Department of Education and in three charter schools. The new State Assessments for students in grades 3–8 will be administered in March. We hope the results will help us to prepare our students more effectively for advanced study in mathematics. High-school mathematics curricula are being transformed into Integrated Algebra, Geometry, and Algebra 2 and Trigonometry. New Regents exams will be administered for Algebra in June 2008, for Geometry in June 2009, and for Algebra 2 and Trigonometry in 2010. We are currently supporting regions throughout the city as they adapt to new curricula and assessments and strive to provide access to high quality mathematics education for all students.

These are exciting times for mathematics educators and for students who have increasing access to media that help them understand how math is used every day. We look forward to sustaining this momentum with our many partners in the coming months.

NEW YORK CITY

MATHEMATIC²S
PROJECT

Mark Your Calendar

Ten County Mathematics Education Association

31st Annual Spring Conference
Cornwall High School—New Windsor, NY

March 2006

New York City Mathematics Project

15th Annual Conference
Lehman College—Bronx, NY

April 1, 2006

National Council of Supervisors of Mathematics

National Conference—St. Louis, MO

April 23–25, 2006

National Council of Teacher of Mathematics

84th National Conference—St. Louis, MO

April 26–29, 2006

T3-Teacher Leader Cadre

Lehman College—Bronx, NY

August 2006

New York State Association of Mathematics Supervisors

Leadership Summit—Albany, NY

September 16, 2006

National Council of Teachers of Mathematics

Eastern Regional Conference—Atlantic City, NJ

October 19–21, 2006

Association of Teachers of Mathematics of New York State (AMTNYS)

56th Annual Conference—Saratoga Springs, NY

October 26–28, 2006

National Council of Supervisors of Mathematics

National Conference—Atlanta, GA

March 18–20, 2007

National Council of Teacher of Mathematics

85th National Conference—Atlanta, GA

March 21–24, 2007

New York City Mathematics Project

16th Annual Conference
Lehman College—Bronx, NY

Spring, 2007

The **New York City Mathematics Project** is a program of the Institute for Literacy Studies at Lehman College, The City University of New York. The newsletter is published once a year. For permission to reprint any portion of this newsletter, please contact the Institute for Literacy Studies at 718.960.8758.

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May Your Life Be Like Arithmetic

$[(\text{Joys added}) + (\text{Sorrows subtracted})] \times (\text{Friends}) = \text{Love undivided}$

NYCMP's Impact

What We Do

The New York City Mathematics Project (NYCMP) is a program of the Institute for Literacy Studies at Lehman College, Bronx, New York. NYCMP's goal is to improve the teaching and learning of mathematics in New York City schools. NYCMP believes that all students should have access to high-quality mathematics education.

NYCMP offers a range of professional-development services in mathematics. These services are provided by knowledgeable and seasoned professionals who have taught in K–12 schools and supervised school and district programs for many years.

On-site consultants work directly with teachers, staff developers, students, parents, and administrators. They lead graduate seminars, study groups, and workshops that focus on teaching, mathematics content and assessment, brain-based learning, leadership, and parent-teacher partnerships.

On-Site Consulting

- Demonstration Lessons
- Co-Teaching
- Modeling
- Facilitation of Staff Meetings

Seminars, Study Groups, and Workshops

- Mathematics Content
- Leadership Strategies
- Professional Development Practices

Fall/Spring/Summer Institutes

For further information, contact Suzanne Libfeld at 718.960.8758.

NYCMP's approach to teaching and learning in mathematics has had a notable impact on students, teachers, and administrators in New York City and nearby regions. In the majority of schools where NYCMP has been a presence for one or more years, student performance on standardized tests, including Regents exams, improves. Data from our most recent external evaluation and surveys of NYCMP program participants reveal:

- 90% of 6,000 students in grades K–8 improved their scores on a specially-designed test aimed at gauging knowledge of mathematics and written communication skills.
- 90% of participating teachers credited NYCMP with increasing their content knowledge of mathematics and their ability to connect this knowledge to specific strategies in the classroom.
- 94% of participants in NYCMP programs agreed that NYCMP improved their ability to address State and City standards in mathematics in their classrooms.
- 80% of participating teachers attributed to NYCMP growth in their own comfort with and enthusiasm for the teaching of mathematics.
- 98% of supervisors stated that since participating in NYCMP study groups, they have a deeper understanding of teaching and learning in mathematics and have used the materials they received to support mathematics instruction in their schools.

2005–2006 Partnerships

NYCMP consultants provide on-site professional-development workshops, graduate seminars, and coaching services. They also collaborate with teachers and school administrators to provide continuing support for curriculum implementation of *Everyday Mathematics*, *IMPACT Mathematics*, and the *New York Math A*. In addition, NYCMP Director Suzanne Libfeld, Leadership Coordinator Maxine Leonescu, K–8 Program Coordinator John Cafarella, and Consultant Jim Duffy, facilitate leadership study groups in Region 2 to focus on issues identified by Local Instructional Superintendents and to enhance instructional leadership.

In 2005, NYCMP conducted leadership institutes for principals, assistant principals, coaches, and staff developers for various regions of the New York City Department of Education. NYCMP also conducted K–8 and High School Mathematics institutes and graduate seminars for teachers and administrators.

In 2006, NYCMP is working with schools in seven regions – 1, 2, 5, 6, 8, 9, and 10 – and with the Carl C. Icahn Charter School, the Bronx Charter School for Children, and the Amber Charter School. NYCMP continues its partnership with Texas Instruments through its sponsorship of the *T3 – Teacher Leader Cadre*, a teachers-teaching-with-technology professional-development institute to be held in August 2006.

Grants for Teachers

NYCMP's 14th Annual Conference

In April 2005, NYCMP held its 14th Annual Conference, *Mathematics Strategies for Success*. Teri Calabrese, New York State Education Department Mathematics Associate, gave the keynote address. She focused on the changes in New York State Mathematics Standards.

More than 200 participants from the New York City metropolitan area gathered valuable professional development experience from sessions led by K–12 teachers, college faculty, and other educators and enjoyed the free give-aways at the vendor booths.

Kudos to all of our presenters:

Attribute Thinking (K–3)

Dr. Helene Silverman, Lehman College

From Planes to Solids: Teaching Geometry Through Touch (K–3)

Sandra Bailey & Beverly Toye, PS 97

Pattern Blocks (K–5)

Maria Rondello, IS 109

Tessellation Fun (3–7)

Nicki Klatzko, Sandy Ingerman, & Clara Kaplan, PS 79 & PS 360

Fallible Friends: Logical Number Puzzles (4–10)

Jonathan Halabi, High School of American Studies at Lehman College

Creating an Enriched Environment in the Math Classroom (4–12)

Miguel Cordero, New York City Department of Education

Graphing Calculator in the Everyday Classroom (9–10)

Cristobal Acosta, High School of World Cultures

Come to Your Senses (9–10)

Maria Michelsson, Mamaroneck High School

Sophisticated Sounding but Basically Simple (9–12)

Frank Gould, former NYCMP consultant

Unexpected Calculus (11–12)

James Perna, Bronx High School of Science

Learning and Leadership Grant

The NEA Foundation

Deadline: June 1, 2006

www.neafoundation.org/program/grantguides.htm

The grant ranges from \$2,000 to \$5,000 for teachers involved in professional development and collegial studies.

Innovative Grant

The NEA Foundation

Deadline: June 1, 2006

www.neafoundation.org/program/grantguides.htm

The \$5,000 grant supports collaborative efforts of colleagues to develop and implement creative project-based learning.

Mathematics Graduate Course Work Scholarship for Grades K–12 Teachers Supported by the Dale Seymour Fund and NCTM

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/seymour2.htm

The purpose of this grant is to provide financial support for improving teachers' understanding of mathematics by completing graduate course work in mathematics. Scholarships with a maximum of \$2,000 each will be awarded to persons currently teaching full-time at the K–12 level. Primary emphasis is placed on appropriate mathematics content courses.

Teacher Professional Development Grants for K–12 Teachers

Supported by the Ernest Duncan Fund and NCTM

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/duncan.htm

The purpose of this grant is to support professional development to improve competence in the teaching of mathematics. Grants of up to \$3,000 for one or more full-time classroom teachers will be awarded to person(s) currently teaching at grades K–12.

Math Quotes

The essence of mathematics is not to make simple things complicated, but to make complicated things simple.

S. Gudder

Do not worry about your problems with mathematics, I assure you mine are far greater.

Albert Einstein

Mathematics is the science which uses easy words for hard ideas.

E. Kasner and J. Newman

Life is good for only two things, discovering mathematics and teaching mathematics.

Siméon Poisson

Grants for Teachers cont'd

Math Centers (K–2)

Bibiana Alba & Carolyn Jandelli, PS 279 & PS 178

Change of a Dollar (K–4)

Georgja Williams & Sharon Davis, CS 50

Double or Nothing (K–8)

Bertha Levine & Peter Runge, PS 184 & MS 391

So, Which Graph Should I Use? Making Sense Out of Graphing (4–8)

Gail Bernstein, PS 152

The Stock Market Game Program: Virtual Learning, Real Results (4–12)

Elizabeth Leshner, Stock Market Game

Using the Graphing Calculator to Teach Dilations (9–10)

Rebecca Bell, Marble Hill School

Mathematics Goes to Hollywood, Broadway, and the Best-Seller List (9–12)

Dr. Susan G. Allen, Mamaroneck High School

Bringing Lines and Parabolas to Life: The Transform Application (9–12)

Elizabeth Coker, DeWitt Clinton High School

Application of Derivatives in AP Calculus Using the TI-84 Calculator (11–12)

Petra Frantova, Truman High School

Thanks to the vendors that sponsored the event:

CPM Educational Program
Glencoe/McGraw Hill
Great Source Education
Heifer International
Key Curriculum Press
Lois Sharzer Associates
Neufeld Learning Systems (JAMS)
Prentice Hall
Sussman Sales, Inc.
Texas Instruments
Triumph Learning
Westsea Publishing

Engage Students in Learning Mathematics Grants for Grades 6–8 Teachers

Supported by the Veryl-Schult-Ellen Hocking Fund

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/shult-hocking.htm

The purpose of this grant is to incorporate middle-school classroom materials or lessons that actively engage students in tasks and experiences to deepen and connect their content knowledge. Grants with a maximum of \$3,000 each will be awarded to persons currently teaching mathematics in grades 6–8.

Narrowing the Achievement Gap in Mathematics Grants for Grades 6–8 Teachers

Supported by the Iris Carl Fund and NCTM

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/carl.htm

The purpose of this grant is to incorporate middle-school classroom materials or lessons that will improve the achievement of student groups that have previous records of underachievement. Grants with a maximum of \$3,000 each will be awarded to persons currently teaching mathematics in grades 6–8.

Improving Students' Understanding of Geometry Grants for Grades K–8 Teachers

Supported by the John and Stacey Wahl Fund

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/wahl.htm

The purpose of this grant is to develop activities that will enable students to better appreciate and understand some aspect of geometry that is consistent with NCTM's *Principles and Standards of School Mathematics*. Grants with a maximum of \$3,000 each will be awarded to persons currently teaching full-time at the K–8 level.

Implementing the Mathematics Content of the Principles and Standards Grant for Grades 7–13 Teachers

Supported by the E. Glenadine Gibb Fund and NCTM

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/gibb.htm

The purpose of this grant is to create lessons to increase mathematics content knowledge for one or more of the Content Standards defined by NCTM's *Curriculum and Evaluation Standards for School Mathematics*. Grants with a maximum of \$3,000 each will be awarded to full-time teachers currently teaching in grades 7–12.

Connecting Mathematics to Other Subject Areas Grants for Grades 9–12 Teachers

Supported by the Theoni Pappas Fund

National Council of Teachers of Mathematics

Deadline: November 6, 2006

www.nctm.org/about/met/pappas.htm

The purpose of this grant is to create high-school classroom materials or lessons connecting mathematics to other fields. Grants with a maximum of \$3,000 each will be awarded to persons currently teaching mathematics in grades 9–12.

Did You Know?

Mr. and Mythez – Math Myths

- 1) Aptitude for math is inborn.
- 2) To be good at math, you have to be good at calculating.
- 3) Math requires logic not creativity.
- 4) In math, what is important is getting the right answer.
- 5) Men are naturally better than women at mathematical thinking.

The New York State Education Department...

- Board of Regents approved, on December 8, 2005, the recommended implementation timeline for the Regents Examinations in Integrated Algebra, Geometry, and Algebra 2 and Trigonometry. Look for the integrated Algebra Regents in June 2008; Geometry Regents in 2009; and the Algebra 2 Regents and Trigonometry Regents in 2010. Also look for the return of Halley's Comet in 2061.
- Grades 3–8 Mathematics Sample Tests are now available for downloading. Included in these materials are Sample Tests and Answer Documents for each grade.
<http://www.emsc.nysed.gov/3-8/math-sample/home.htm>

The new New York City Department of Education Mathematics Power Point Presentations include...

Everyday Mathematics

- For Educators
- For Families
- Math Steps

IMPACT Mathematics

- For Educators
- For Families

Prentice Hall New York Math A

The presentations can be found at:
<http://www.nycenet.edu/Offices/TeachLearn/OfficeCurriculumProfessionalDevelopment/DepartmentofMathematics/BalancedMathematics/mathcurricoverview.htm>

Matharama

When reduced to a single digit, the sum of the digits of any cube number will always be 1, 8, or 9.

For example:

$$5^3 = 125 \rightarrow 1+2+5=8$$

$$9^3 = 729 \rightarrow 7+2+9=18 \rightarrow 1+8=9$$

$$17^3 = 4913 \rightarrow 4+9+1+3=17 \rightarrow 1+7=8$$

$$4^3 = 64 \rightarrow 6+4=10 \rightarrow 1+0=1$$

The numbers also follow a cycle. The numbers 1, 8, and 9 appear in order:

$$1^3 - \text{sum of the digits} = 1$$

$$2^3 - \text{sum of the digits} = 8$$

$$3^3 - \text{sum of the digits} = 9 \quad (27 \rightarrow 2+7=9)$$

$$4^3 - \text{sum of the digits} = 1 \quad (64 \rightarrow 6+4=10=1+0=1)$$

$$5^3 - \text{sum of the digits} = 8 \quad (125 \rightarrow 1+2+5=8)$$

$$6^3 - \text{sum of the digits} = 9 \quad (216 \rightarrow 2+1+6=9)$$

Presentations

May 2005

Teacher of the Year Conference
 Washington, DC
 John Cafarella – Teacher Leadership

June 2005

Bronx High School of Science
Advanced Placement Classes
 Bronx, NY
 Stanley Taback – Evaluating a Definite Integral Using an Unusual Riemann Sum

October 2005

National Science Teachers Association
Regional Conference
 Hartford, CT
 John Cafarella – Teaching from the Far Side

Association of Mathematics Teachers of New Jersey
 Somerset, NJ
 Maxine Leonescu – The Magic Pot – Algebraic Thinking

November 2005

Science Teachers Association of New York State
 Ellenville, NY
 John Cafarella – Teaching from the Far Side

55th Annual Meeting of the Association of Mathematics Teachers of New York State
Elementary Math Mentors
 Buffalo, NY
 Suzanne Libfeld – Connecting Algebra Tiles with the Grade 8 Algebra Strand

December 2005

St. Paul Public Schools Teachers & Principals
 St. Paul, MN
 John Cafarella – The Art and Craft of Questioning

February 2006

Indiana State Science Teachers
 Indianapolis, ID
 John Cafarella – Teaching from the Far Side

Mathematics Institute for New York State
United Teachers
 New York, NY
 Helene Silverman – Squeezed in the Middle

April 2006

National Science Teachers Association
National Conference
 Anaheim, CA
 John Cafarella – Teaching from the Far Side

Websites from the NYCMP Team

National Council of Teachers of Mathematics
<http://www.nctm.org/>

New York State Education Department
<http://www.emsc.nysed.gov/ciai/mst/math.html>

Association of Mathematics Teachers of New York State
<http://www.amtnys.org/>

New York City Department of Education
<http://www.nycenet.edu/Offices/TeachLearn/OfficeCurriculumProfessionalDevelopment/DepartmentofMathematics/default.htm>

Math Maven's Mysteries
<http://teacher.scholastic.com/maven/index.htm>

Ask Dr. Math
mathforum.org/dr.math/

Project Interactive
<http://www.shodor.org/interactivate/>

New York State Regents Prep Center
<http://regentsprep.org/Regents/math/math-a.cfm>

Exploratorium – 10 Cool Sites in Mathematics
http://www.exploratorium.edu/learning_studio/cool/mathematics.html

National Library of Virtual Mathematics
<http://nlvm.usu.edu/en/nav/vlibrary.html>

American Mathematical Society-eMath
e-math.ams.org

Brain Teasers
www.eduplace.com/math/brain

Education 4 Kids
www.edu4kids.com

Flashcards for Kids
www.edu4kids.com/math/

Geometry Center
www.scienceu.com/geometry

Lemonade Stand
www.coolmath4kids.com/lemonade

MathCounts
www.mathcounts.org

Plane Math
www.planemath.com

World Wide Web Virtual Library-Math
euclid.math.fsu.edu/Science/math.html

Consultants' Corner

Jim Duffy – Mathematical Tic Tac Toe in the Cartesian Plane

Divide the class into two groups, the "x's" and the "o's."
Distribute graph paper to students.
To win, your group needs FOUR points in a row such as (1,1), (2,2), (3,3), and (4,4).
The groups alternately pick points trying to get four points in a row while trying to block the other group from getting four points in a row.
The four points may be horizontal, vertical, or diagonal.
The first numbers mentioned by a group are used. If a side picks (3,2) instead of (2,3) it will result in groans or worse.
When the class becomes adept with the game, ban the interior of the first quadrant!
The group that wins the most games in the set amount of time gets a prize.

Joyce Kleiman – Getting Back in the Game

I was recently asked to support elementary school teachers who were looking for activities to help students who had some deficiencies in basic mathematical skills. Many of these students were having trouble learning and retaining concepts due to their lack of computation skills. As a result, these students became discouraged. It was obvious to me that a "more of the same" approach to this problem would not work.

Playing math games with students has always been part of the mathematics curriculum. Until recently, these games were seen as a peripheral part of the elementary math program. However, in the *Everyday Mathematics* program, games represent a core strategy for teaching and reinforcing mathematical skills. I seized upon these games as a vehicle for these students to connect with numbers in a different way. I taught the students various games that would enhance their basic skills. Their response was so enthusiastic that their teacher and I arranged for them to teach their class a game they learned. The teacher was enthusiastic and reported to me that these students had suddenly become "stars in her classroom." In addition to becoming more comfortable with mathematics, they became more comfortable with themselves as learners. As a result, their new-found self-esteem put them "back in the game" of education.

Judy Diament – Mathematics Resource Books

Our study group at Maxwell Vocational High School decided to share their favorite resource books from their personal math libraries. Some of the titles are listed below:

Get It Together: Math Problems for Groups, Equals by Tim Erickson. Berkeley, CA, 1989.

Problem of the Week by Jane Felser. Frank Schaeffer Publications. Torrance, CA, 1995.

The Joy of Mathematics by Theoni Pappas. Wide World Publishing. San Carlos, CA, 1989.

Fractals, Goggles and Other Mathematical Tales by Theoni Pappas. Wide World Publishing. San Carlos, CA, 1993.

Geometry Labs by Henri Picciotto. Key Curriculum Press. Emeryville, CA, 1999.

Algebra Problems: One Step Beyond by Reuben Schadler. Dale Seymour Publications. New Jersey, 1992.