Celebrating GMC 2008
Author Guidelines

Manuscript Format: Manuscripts are blind reviewed by members of the editorial review board. For this reason, each manuscript should include a cover sheet containing: title of manuscript, author’s name, position and email address. Identifying information should not appear elsewhere in the manuscript in order to ensure an impartial review.

Manuscripts should be double-spaced, with 1-inch margins on all sides, typed in 12-point font and follow the APA 5th Edition style guide. Manuscripts should be submitted in MS Word. If you have a picture or graphic in the text, please include the original picture(s) in a separate file.

Manuscript Submission: Manuscripts should be submitted to reflections@georgiasouthern.edu. Receipt of manuscripts will be acknowledged. Manuscripts are accepted for consideration with the understanding that they have not been published previously and are not being considered simultaneously for publication elsewhere. Additional inquiries should be sent to Gregory Chamblee, Editor, Georgia Southern University, Department of Teaching and Learning, PO Box 8134, Statesboro, GA 30460-8134; Phone: 912.478.5701; Fax: 912.478.0026; reflections@georgiasouthern.edu.

Manuscript Publication: When a manuscript is accepted for publication, the editor/journal reviewers may make suggestions or revisions in consultation with the principal author. However, because of publication deadlines the editor reserves the right to make minor revisions without seeking prior approval from the author. Release statements for all copyrighted materials must be received prior to publication. Upon publication, two complimentary copies of the issue are sent to the principal author.
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As you read this column, play a soundtrack of Wham!’s “Wake Me Up Before You Go-Go,” Madonna’s “Like a Virgin,” Chaka Khan’s “I Feel for You,” and Lionel Richie’s “Say You, Say Me” on the in the audio system of your imagination.

What happened in 1985? Those songs were top hits. The San Francisco 49ers and Joe Montana beat the Miami Dolphins and Dan Marino to win Super Bowl XIX. Ronald Reagan was actually inaugurated for his second term on Super Bowl Sunday. Top TV shows that year? You might have watched “The Cosby Show,” “Family Ties,” “Murder, She Wrote,” “60 Minutes,” “Cheers,” or “Dallas.” Fashion? Did you have a power suit, Flashdance leg warmers, shoulder pads, Miami Vice t-shirts with designer suits, Michael Jackson’s Thriller leather jacket? What else happened that year? In 1985, VH1 launched in the United States and Elmo was introduced as a new character on Sesame Street.

1985 was the year I started teaching mathematics at Dunwoody High School. I received my diploma from Auburn in December 1984 and Dekalb County offered me a position teaching in January 1985. My teaching load was Algebra I Advanced, Geometry General, Algebra II, and the 8th grade “trailer” course (for any students who had failed any semester that year) as I floated through five different classrooms. Of course, I was ecstatic to actually be teaching. Somehow I found time to help coach basketball and gymnastics that spring.

What's the point? That year, 24 years ago, was when the Quality Core Curriculum (QCC) was written. We have taught those QCCs for the past 21 years until we began teaching the Georgia Performance Standards (GPS) in 2006 in sixth grade. This year, we're adding Math I in ninth grade, adding Math II for tenth graders next year, and so on. We'll teach the GPS in grades K-12 in 2011-2012.

Think about the changes since 1985. You probably have at least one internet-connected computer in your classroom. Did you know what the Internet was in 1985? Technically, it existed as the ARPANet or NSFNet, but only began to be accessible to the general public in 1988 as commercial networks were connected to those networks. Most of us didn't know much about it until the 1990s.

Think about your phone in 1985. The first cellular mobile phones were coming out. I didn't get a “bag phone” until the 1990s. Remember those first bulky car phones? Unattractive, but technologically amazing at the time. Compare it to the phone you carry now.

DVD players, TiVO, iPods, SmartBoards, PDAs. Think of their 1986 equivalents: VHS, Sony Walkman, chalkboards, calendars. In the 1980s, could we have even imagined the technologies that we take for granted now?

To say nothing of the changes in the world around us. The Berlin Wall separated East and West Germany until 1989. We were nearing the end of the Cold War with the Union of Soviet Socialist Republic. China was about to face its 1989 Tiananmen Square protests.

Did our QCC keep up with the changes in our world and our technologies? Given our rankings on national comparisons, I would argue no. My work over the past 18 years as a mathematics teacher educator has given me the opportunity of meeting many of you, especially from the northern and metro-Atlanta part of the state. Right now I can vividly picture classrooms in many of those schools, including Elberton Middle School, Barnett Shoals Elementary School, Crim Open Campus High, Greene-Taliaferro High, Awtrey Middle, Avondale Middle, Tucker High (when it existed), Sonoraville High, Morrow Middle, Big Shanty Elementary, Tapp Middle, Grady High, and Woodland High.

I've enjoyed being in all those schools and meeting Georgia mathematics teachers. What I've found true in all those settings is that Georgia's mathematics teachers are bright, hard working, and very committed to their students’ learning. Our students aren't that different from students in other states. The only explanation for our lagging achievement in mathematics is our curriculum. The QCC wasn't a curriculum that has kept up with the world around us and the needs of our students.

Changing the curriculum is vital for our students’ success and for our state's competitiveness. I salute the
sixth grade teachers who were the first to adopt the Georgia Performance Standards in 2006. I’d like to congratulate teachers of grades K through nine who have now implemented the GPS. I know each year of implementation is challenging. I hope that you have found it a time to collaborate with your colleagues to work towards the goal of teaching this rigorous new curriculum well.

I’m firmly convinced that the GPS curriculum has the potential for the greatest impact on Georgia students’ mathematics learning than anything else in the last 25 years I’ve taught. We have the chance to change the world for our students. I’m excited to see what mathematics they’ll know after coming through the GPS.

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” Margaret Mead (1901 - 1978)

Thanks for your dedication to teaching Georgia’s children mathematics!

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**Call for Manuscripts**

**Topics:**
GPS implementation manuscripts are needed. For example, instructional strategies to teach GPS, GPS implementation issues, working with special populations in a GPS environment and sample student task solutions are some of the ideas of interest.

**Teaching Tips Ideas:**
Share with your fellow teachers a pearl of instruction or assessment wisdom you have used in your classroom. Topics include how to design and implement effective warm-ups, strategies for implementing journal writing, etc. Manuscripts published in this section are typically one page in length.
50th Annual Georgia Mathematics Conference at Rock Eagle

Conference information is located at

www.gctm.org
Membership Report

by Susan Craig
secddc@aol.com

Professional development opportunities, student activities, excellent journal, superb annual conference, collegial support and friendships, summer workshops, grants for classroom use, honors and awards! All wonderful benefits of GCTM membership, which only get better each year…and all for a small price! So economical it is recession proof. The price remains low and the benefits grow!

As we approach our 50th Georgia Mathematics Conference in 2009, let’s work to make our membership rolls reach an all time maximum. With online renewal it could not be easier to renew or become a member of GCTM. Please encourage your fellow teachers to join our ranks. Many members did not renew at the time of the conference in 2008 and thus our membership numbers are down considerably. If you have a colleague who is not now receiving this publication, please encourage them to go to www.gctm.org and renew today. No one will want to miss this anniversary celebration or the chance to vote in the spring elections, so renewing today will bring all the information to your mailbox.

Membership changes voted in by the board include a new level of membership for fulltime graduate students who are on leave from teaching. The cost of membership for this new level will be $10 annually, with certification from the student’s university advisor that they are enrolled as fulltime, non-teaching students. Membership, for students who have never taught before, remains free and renewable with advisor verification.

Thank you for your patience as we continue to make the transition to online membership maintenance and renewal. If you have any questions please send them along to me at secddc@aol.com

Have a wonderful semester!

GCTM Nominating Committee

by Tom Ottinger
Past-President

Nomination committee members Barbara Ferguson, Cathy Franklin, and Tom Ottinger offer our thanks to each nominee for their willingness to serve GCTM and the students of Georgia.

The nominating committee submits the following names for the upcoming election:

President
Dan Funsch
Debbie Poss

Vice President for Advocacy
Karen Lawrence
Linda Crawford

Vice President for Constitution and Policies
Melanie Helms
Debbie Gober

Secretary
Patti Barrett
Christy Wray
The Georgia Mathematics Conference was a great success. Conference sessions were full of enthusiastic participants. Keynote speakers challenged conference participants to further their dedication to implementing a hands-on curriculum in their classrooms. Technology sessions were abundant. Hands-on strategies to teach content were numerous. Entertainment options were available each evening of the conference. All left reinvigorated to teach the Georgia Performance Standards to their students. We all look forward to Conference 2009!
Conference 2008
2008 GCTM Awards

Gladys M. Thomason Award

Dr. James Wilson
The University of Georgia
Athens, GA

John Neff Award

Jane Barnard
Armstrong Atlantic University
Savannah, GA

Dwight Love Award

Steve Sigur (1946-2008)
presented posthumously
The Paideia School
Atlanta, GA

Excellence in Teaching Secondary Mathematics

Melanie Helms
Ware County High School
Ware County Schools
# Excellence in Teaching Middle School Mathematics

Shirley McDonald  
Ringgold Middle School  
Catoosa County Schools

# Excellence in Teaching Elementary Mathematics (No Award This Year)

# Teacher of Promise Award

Katherine Brown  
Bethlehem Elementary School  
Barrow County Schools

# Friend of Mathematics Award

Cheryl Keck  
ETA/Cuisenaire

# Minigrant Awards

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<thead>
<tr>
<th>Name</th>
<th>School</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Jennifer Lockwood</td>
<td>Centennial Place Elementary School Atlanta Public Schools</td>
<td>Received $300 for A Taste of Statistics. Students will design a whole-school experiment related to a Coca Cola taste test, collect data, conduct significance tests, create a confidence interval, interpret the results, and write a paper.</td>
</tr>
<tr>
<td>Ben Pitchford</td>
<td>Colquitt County High School</td>
<td>Received $300 for A Taste of Statistics. Students will design a whole-school experiment related to a Coca Cola taste test, collect data, conduct significance tests, create a confidence interval, interpret the results, and write a paper.</td>
</tr>
</tbody>
</table>
Name:
Dan Funsch

Present Position:
The Alleluia Community School (Augusta, GA) -- Administration; Mathematics teacher

Present GCTM Position:
Treasurer

Universities Attended and Degrees Held:
1974  B.A.  Mathematics/French  St. Mary's University, San Antonio, TX

Professional Experience:
• 1981 Present  The Alleluia Community School (Augusta, GA) Administration; Mathematics teacher: Geometry, Trigonometry, Pre Calculus, Basic Math, Algebra I and II, Special Needs Program
• 1991 -1992 Editor and author (consultant basis) for National Science Center Foundation Learning Logic Algebra I program.
• 1977 1979 Lanier H.S. Bexar County (San Antonio, TX) Math Teacher: Geometry, Algebra I, Basic Math

GCTM Offices/Committees:
• Treasurer 2000-Present
• Conference Chair, 2000
• Director of Finance, Georgia Mathematics Conference (Rock Eagle) 1997-Present
• Regional Representative to the Executive Board, 1990 91
• East Central Region President, 1986 87

Other Professional Organizations and Offices:
• Member NCTM, NSTA, GSTA
• Frequent presenter at state and regional meetings of NSTA and GCTM
• C.S.R.A. Mathematics Collaborative, Member 92-99; Chair 95-96
• Participant, NASA Teacher In Space Program, 85-86
• The “Math person” on the team that founded the Alleluia Community School, 1981
• Math Club Sponsor/Coach 1979- ’90 at Butler H.S. (Richmond County, GA) and the Alleluia Community School

Honors:
• 2006 Gladys M. Thomason Award for contributions to mathematics education
• 2003 Georgia Science and Mathematics Roundtable Award
• 1999 State winner (GA) in Compaq’s Teaching with Computer Technology Grant Program
Name:  
Debbie Poss

Present Position:  
Lassiter High School (Marietta, GA) - Mathematics teacher

Present GCTM Position:  
Vice President of Competitions

Universities Attended and Degrees Held:
BA  Math/Physics  Berry College
MS  Math Education  West Georgia College

Professional Experience:
• 1995-Present  T3 instructor in Geometry, Algebra and Precalculus, and technology for science teachers
• 1991- Present  Cobb County School District, etc. teaching staff development in technology use (many types), Geometry, Gifted Math Ideas
• 1983-Present  Lassiter High School in Marietta, Georgia. Teaching assignments included: analysis, geometry (all levels), algebra I, algebra II (honors and gifted), general math, quantitative literacy, applied algebra, physical science, advanced algebra and trig, gifted analysis, Advanced Placement Statistics, multivariable calculus, and accelerated math II
• 1978-1983  East Rome High School in Rome, Georgia. Teaching assignments included: physics, geometry (high level and regular), computer science, basic skills math, physical science, and general math

GCTM Offices/Committees:
GCTM Vice President for Competitions  1996 - present

Other Professional Organizations and Offices:
• Member - NCTM, T^3
• Speaker at GCTM, NCTM, T^3 Regional, National, and International Conferences  1990-Present
• Taught state GPS  2006-2008
• Helped write Math I, Math II frameworks for GPS  2005-2006
• Member of SAT Math Advisory Board  2001-2006
• Wrote and proofread SAT questions for ETS  1993-2000
• Co-Sponsor of the Georgia All-State math team, which in 1992 won the national championship at the ARML competition - 1990-Present
• Served on curriculum and textbook committees  1987, 1994, 2000
• Select Governor’s Honors Program participants at the state level  1985-Present
• Co-Sponsor of the Lassiter High School’s very active math team  1983-Present

Honors:
• Dwight Love Award - 2004
• Presidential Award - 2001
• Tandy Technology Finalist - 2000
• Rountable Winner - 1991
• Lassiter High School Teacher of the Year - 1987
Vice President for Advocacy (2 candidates – Vote for One)

Name:
Linda Crawford

Present Position:
Assistant Professor - Augusta State University

Present GCTM Position:
None

Universities Attended and Degrees Held:
PhD  University of Georgia
MEd  Augusta State University
BS  Georgia College

Professional Experience:
• Conduct professional development workshops for teachers in my geographical area
• Instructor (1988-1993) and assistant professor (1993-present) at Augusta State University in Augusta, GA
• 1975-1986 taught secondary and middle grades mathematics at Edmund Burke Academy in Waynesboro, GA

GCTM Offices/Committees:
Program Committee - 2009

Other Professional Organizations and Offices:
• Member  NCTM, GSSM
• Georgia Association of Mathematics Teacher Educators - Member-at-large 2007-2009

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GCTM Grants and Awards Opportunities

• Gladys M. Thomason Award for Distinguished Service
• Dwight Love Award
• John Neff Award
• Awards for Excellence in the Teaching of Mathematics (Elementary, Middle & Secondary levels)
• Teacher of Promise Award
• Mini-Grants
• Special Projects

For additional information visit the GCTM website www.gctm.org.
Name:
Karen Lawrence

Present Position:
Dean Rush Middle School (Cherokee County) - Mathematics teacher

Present GCTM Position:
None

Universities Attended and Degrees Held:
MA Education Pan American University
BS Education Texas A&M University

Continuing education classes: East Texas State University, Colorado School of Mines, Colorado Christian University, Kennesaw State University

Professional Experience:
I have been teaching for 25 years in Texas, Colorado, Tennessee, and currently Georgia. I have taught Kindergarten through 9th grade. At the elementary and middle school level I taught all subjects. I have stayed current with my profession by attending GCTM, NCTM, and T^3 International Conferences. I have been a presenter at both GCTM and T^3 as well as teaching technology classes for Cherokee County.

GCTM Offices/Committees:
None

Other Professional Organizations and Offices:
• Member - PAGE, U. S. Marine League
• Boy Scouts of America Assistant Troop Leader
• Venture Crew Assistant Advisor

Honors:
• Molly Marine Award (an award I received while serving in the Marine Corps)
• Order of the Arrow (the honor organization of scouting)
• Multiple recipient of Who’s Who Among America’s Teachers
• Kiwanis Outstanding Teacher Award
• 2007 Award for Excellence in Teaching Middle School Mathematics
• Star Teacher Award
Name:
Debbie Gober

Present Position:
Professor/Chair, Teacher Education, Columbus State University

Present GCTM Position:
None

Universities Attended and Degrees Held:

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<th>Year</th>
<th>Degree</th>
<th>Field</th>
<th>Institution</th>
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<tr>
<td>1998</td>
<td>PhD</td>
<td>Mathematics Education</td>
<td>The University of Georgia</td>
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<tr>
<td>1993</td>
<td>MA</td>
<td>Mathematics Secondary Education</td>
<td>Appalachian State University</td>
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<tr>
<td>1982</td>
<td>BA</td>
<td>Secondary Education (Magna cum laude)</td>
<td>Asbury College</td>
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Professional Experience:
- 2007-Present  Professor of Mathematics Education, Columbus State University
- 2006-Present  Department Chair, Teacher Education, Columbus State University
- 2001-Present  NCATE/PSC Coordinator, Columbus State University
- 2005-2006    Interim Department Chair, Teacher Education, Columbus State University
- 2002-2005    Associate Professor of Mathematics Education, Columbus State University
- 1998-2002    Assistant Professor of Mathematics Education, Columbus State University
- 1994-1998    Graduate assistant, Mathematics Education Department, University of Georgia
- 1993-1994    Mathematics Teacher, Freedom High School, Burke County School District, Morganton, NC
- 1992-1993    Graduate teaching assistant, Mathematics Department, Appalachian State University, Boone, NC.
- 1982-92      Mathematics Teacher, Freedom High School, Burke County School District, Morganton, NC

GCTM Offices/Committees:
Program Committee

Other Professional Organizations and Offices:
- Association for Supervision and Curriculum Development (Fall 2007-present).
- Phi Kappa Phi (Spring 2007-present).
- Georgia Association of Mathematics Teacher Educators (Fall 2005-present).
- Association of Mathematics Teacher Educators (January 2000-present)
- Chattahoochee Council of Teachers of Mathematics, Vice-President (Fall 2001-Spring 2003); member (Fall 2001-present).
- Georgia Coalition of Science, Technology, and Mathematics Education Advisory Council (1999-2002).
- Professional Association of Georgia Educators (January 1999-present).

Honors:
- Inducted into Phi Kappa Phi, April 2007.
- Nominated for Georgia Council of Teachers of Mathematics Gladys M. Thompson Distinguished Service Award, Fall 2005.
- Thomas E. Harrison Leadership Award, College of Education, Columbus State University, April 2005.
- Faculty Service Award, Columbus State University, March 2005.
- Recipient of the Dean’s Faculty Incentive Award for successful completion and presentation of Year Two Preparing Tomorrow’s Teachers to Use Technology Project, July 10, 2001.
- Recipient of the Dean’s Incentive Award for outstanding performance and contribution to The Transforming Teacher Education Project, August 15, 2000.
**Name:**
Melanie Helms

**Present Position:**
Ware County High School - Mathematics teachers - Team leader

**Present GCTM Position:**
None

**Universities Attended and Degrees Held:**
- MSEd  Secondary Education  Valdosta State University
- BS  Secondary Education  Valdosta State University
- BS  Applied Mathematics  Valdosta State University

**Professional Experience:**
- 2006-present  Ware County High school  Math teacher  Team leader  9th grade math lead teacher
- 1994-2006  Clinch County High School  Math teacher  Department Head

**GCTM Offices/Committees:**
None

**Honors:**
- Secondary Education Excellence in Teaching Award 2008

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**Learn More About Your Organization**

[www.gctm.org](http://www.gctm.org)

- Grants and Award Information
- Membership Renewal
- Mathematics Competitions
- Previous *Reflections* Issues
- Other
Name: Patti Barrett

Present Position: Math Instructor at Valdosta State University

Present GCTM Position: Secretary of GCTM Executive Board

Universities Attended and Degrees Held:
1985 EdS Mathematics Education Valdosta State University
1970 MEd Mathematics Education Valdosta State University
1969 BS Education Valdosta State University

Professional Experience:
• 2007-present Full-time Instructor Valdosta State University
• 1970-1983, 1986-2006 Teacher Lowndes High
• 1983-1986 County Math Supervisor Lowndes County Schools
• 1974-2008 Part-time Instructor Valdosta State University

GCTM Offices/Committees:
• Region Secretary
• Region President
• Treasurer of Georgia Mathematics Conference Board
• Chairman of GMC Board
• Secretary of GCTM Executive Board

Other Professional Organizations and Offices:
Lowndes Association of Educators Treasurer and President

Honors:
• Lowndes High Teacher of the Year twice
• STAR Teacher three times
• Woman of Achievement Award nominee twice

Call for Reviewers
The journal is in need of reviewers. If you have an interest in reviewing please send your name to reflections@georgiasouthern.edu.
Name:
Christy Wray

Present Position:
Curriculum Director (Grades 6-12) - Mitchell County School System

Present GCTM Position:
Southwest Regional Representative

Universities Attended and Degrees Held:

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<th>Year</th>
<th>Degree</th>
<th>Field of Study</th>
<th>Institution</th>
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<tr>
<td>2009</td>
<td>EdD</td>
<td>Administrator Leadership</td>
<td>Walden University</td>
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<tr>
<td>2007</td>
<td>EdS</td>
<td>Administrator Leadership</td>
<td>Walden University</td>
</tr>
<tr>
<td>1999</td>
<td>MEd</td>
<td>Mathematics Education</td>
<td>Georgia Southern University</td>
</tr>
<tr>
<td>1997</td>
<td>BS</td>
<td>Mathematics</td>
<td>Georgia Southern University</td>
</tr>
</tbody>
</table>

Professional Experience:
- 2009-Present  Director (Grades 6-12) for the Mitchell County School System
- 2007-2008  Curriculum/Instructional Coach for Mitchell County High School
- 1999-2007  Mathematics Teacher at Stockbridge High School
- 1997-1999  Mathematics Teacher at East Laurens High School

GCTM Offices/Committees:
- Southwest Regional Representative
- Executive Committee member
- Program Committee member for the Georgia Mathematics Conference

Other Professional Organizations and Offices:
- AMAG: Applied Mathematics Association of Georgia  State Secretary (’98 –01)
- GCSM: Georgia Council of Supervisors of Mathematics
- Alpha Delta Pi National Sorority

Honors:
- Contributor to the TI-Nspiring Times (Texas Instruments) newsletter (2009),
- Authored/coordinated the FY08 Title II, Part D: Enhancing Education Through Technology (Ed Tech) Competitive Grant ($93,592 awarded to MCHS) (2008),
- Ambassador for Walden University (2008 to present),
- Gifted Endorsement Certification (Grades 9-12) from Griffin RESA (2005),
- Selected to be a GIFT (Georgia Industrial Fellowship for Teachers) Fellow and worked for the Georgia Institute of Technology (GA Tech) (2002-2003), Awarded the Siemens/Westinghouse Grant for exceptional performance as a GIFT Fellow (2002)
Building Confidence in Algebraic Operations:

by Joy W. Darley
Georgia Southern University
jdarley@georgiasouthern.edu

Traveling from Fractions to Rational Expressions on the Number Line

Editor’s Note: This is the second half of an article that was published in the Fall 2008 issue.

Multiplying Fractions (Repeated Addition)

Concept Image for Fraction:

Amy triples a recipe that normally takes two-thirds of a stick of butter. How much butter should she use?

\[
3 \cdot \frac{2}{3} = \frac{3 \cdot 2}{3} = 2
\]

Multiplying Rational Expressions

\[
3 \cdot \frac{x}{3} = \frac{3 \cdot x}{3} = x
\]

\[
5 \cdot \frac{2x+4}{5} = \frac{5(2x+4)}{5} = 2x + 4
\]

Multiplying Fractions (Partitioning)

Concept Image for Fraction:

Roxanne is planning to run a 3 mile race. One of the officials tells her that she has already run two-thirds of the distance. How many miles has Roxanne run?

\[
\frac{2}{3} \cdot 3 = \frac{2 \cdot 3}{3} = 2
\]

Multiplying Rational Expressions

\[
\frac{2 \cdot x}{x} = \frac{2 \cdot x}{x} = 2
\]

\[
\frac{2}{3x-4} \cdot \frac{(3x-4)}{3x-4} = \frac{2(3x-4)}{3x-4} = 2
\]

Note: \( x \neq \frac{4}{3} \)
Multiplying Fractions (Fraction by a fraction)

Concept Image for Fraction:

Marcia found two-thirds of a sub sandwich on the table. She decides to eat one-half of it. How much of the original sandwich did she eat?

\[
\frac{1}{2} \cdot \frac{2}{3} = \frac{1 \cdot 2}{2 \cdot 3} = \frac{1}{3}
\]

Dividing Fractions (Repeated subtraction)

Concept Image for Fraction:

A certain track is \textit{two-thirds} of a mile. How many times will Julie need to run this distance if she needs to run 2 miles?

How many times can you repeatedly take two-thirds from 2?

\[
2 \div \frac{2}{3} = 2 \div \frac{2}{3} = \frac{2 \cdot 3}{1 \cdot 3} = \frac{2 \cdot 3}{1 \cdot 2} = 3
\]

Dividing Rational Expressions

\[
\frac{2}{1} + \frac{2}{3} = \frac{2 \cdot 3}{1 \cdot 3} = \frac{2 \cdot 3}{1} = \frac{5x}{2} = \frac{5x}{1} = 5x
\]

Note: \(x \neq 0\)

Dividing Fractions (Sharing)

Concept Image for Fraction:

Blake and David are looking at \textit{four-fifths} of a pizza. How much should each boy get if they cut the pizza in two equal slices?

\[
\frac{4}{5} \div \frac{2}{1} = \frac{4 \cdot 1}{5 \cdot 2} = \frac{4 \cdot 1}{5 \cdot 2} = \frac{2 \cdot 2 \cdot 1}{5 \cdot 2} = \frac{2}{5}
\]

Dividing Rational Expressions

\[
\frac{5x + 10}{y - 3} + \frac{x + 2}{y - 3} = \frac{5(x + 2)}{y - 3} \cdot \frac{1}{x + 2}
\]

Note: \(y \neq 3, x \neq -2\)
So much has happened since my last column. There was the Georgia Math Conference, the holidays and a Presidential Inauguration. The conference was wonderful! I visited the exhibits and found myself loaded with new math literature books that I couldn’t possibly live without. The first of them is a cute little book on measurement entitled *The Dog Is a Paw a Foot?* published by Scholastic, Inc. © 2005). Children love dogs and this book is loaded with cute pictures of dogs, puppies, and more dogs and puppies. All of the pictures are photographs of real dogs and puppies, not silly drawings. It also covers measurement in relation to dogs and puppies. It compares sizes including facts on the tallest and shortest dogs. It talks about length (of dog bones), compares dog paws to human feet. You discuss inches in relation to the width of a dog’s face. This book will make a discussion of measurement fun and relative to everyday life. You could even get brave and have students bring in their dogs for a measurement day. For older students you could have them measure their dogs at home and then have them draw a life size picture of the dog using the measurements they got.

Another good book for measurement (telling time) is by Judy Sierra. *What Time Is It, Mr. Crocodile?* (© 2004, First Voyager Books, Harcourt). This book is cute, but a bit silly. Designed for the younger students, it talks about telling time to the hour as Mr. Crocodile makes his daily schedule. Primary children will enjoy the silly pictures as they look for the clock on each page and read the time. Most of the clocks have numbers at each hour but one has Roman Numerals and a couple just have tic marks for the numbers. A good challenge for your better students as they figure out what the hour should be. A nice follow-up to this book would be to make a flip-book having your students copy the clock and what Mr. Crocodile is doing. Or maybe draw the clocks and illustrate with what the students are doing at that time. For another lesson, have older students calculate elapsed time, (ex. How long was it from the time Mr. Crocodile ate breakfast until he went to the library?) Use this as an introductory lesson on telling time to the hour and follow-up with discussions comparing Mr. Crocodile’s day to their own lives. Lots of possibilities here. It also has an undertone on the value of friendship.

Have you ever looked for a good math poem? … fractions? … measurement? … time? and so on. Now, I’ve found just such a book. While Lee Bennett Hopkins’ book *Marvelous Math* is not particularly new, (©1997, Aladdin Paperbacks) it is a great collection of poems. I particularly like *Take a Number* by Mary O’Neill. It talks about a world without numbers and leads to some wonderful discussions on the importance of numbers in our world. The pictures are bright and colorful and appealing to students at all levels. This would be a good book to add to your classroom library as it fits in with many different math lessons on various grade levels.

If you are using any or all of the “Sir Cumference” books (5 of them) with your geometry lessons there is now a book with 30 lessons linking the books to math. Now I know that most of you have created or have access to lessons already, but sometimes it sure is nice to be able to find something different to spice up what you’ve been doing. One great feature of this book is the chart on the back cover. There’s a list of lesson activities and their correlation to the Multiple Intelligences. Inside, there is a story map (linking literature skills) that includes the problem solving sections of the story. You will also find a puppet show to accompany *Sir Cumference and the First Round Table*. If you want to create a game to use in your classroom, check out pages 8-9 where you will find a game board. There is a nice variety of activities from which to choose, so there should be something for everyone.

I found a relatively new counting book where you are counting feet. April Pulley Sayre and Jeff Sayre wrote *One Is a Snail Ten Is a Crab.* (©2006, Candlewick Press). This begins as a simple counting book counting feet. “1 is a snail” “2 is a person” but progresses through to 100, showing combinations like “90 is nine crabs or ten spiders and a crab”. This book is set at the beach of course (where else would you expect to find crabs) and the illustrations are bright, colorful and just plain funny. Read this book with the class for fun and then go back, reread, and talk about the math. Use the book as a springboard and let the students create their own books. Maybe *One is a Worm and Four is a Cow***? The combinations presented make students think.
Springtime makes us think of Easter and rabbits. Ann McCallum wrote a book called *Rabbits Rabbits Everywhere A Fibonacci Tale*. (© 2007, Charlesbridge) If you remember the Pied Piper of Hamelin, then you'll recognize the story in this book, except now it's the Pied Piper of Chee and this town is overrun with rabbits. But in this story, the rabbits multiply in a pattern, a Fibonacci pattern. This very easy to understand explanation of Fibonacci numbers is brought out in the story as Amanda, a young girl in the story, figures out the pattern and saves the community vegetable garden. The book is clever, colorful and does a good job of explaining Fibonacci number patterns for young children.

Another new book I found at Rock Eagle is entitled *Greater Estimations* by Bruce Goldstone. (© 2008, Henry Holt and Company) I think this book is wonderful! It's bright, colorful, interesting to children and adults and it teaches you estimation strategies through helpful hints on the pages. The book immediately drew me in with its cover filled with rubber ducks, rows and rows of yellow rubber ducks. The author shows you how to estimate the large group of ducks by breaking them down into groups of ten and then hundreds, etc. After moving through the ducks, he invites you to look at other large groups of things and gives you hints on how to estimate the quantity of them. These items include dandelion seeds, bees, stars and more.

Then he moves into estimating height, weight, length, volume, and really big numbers. One of my favorites is estimating how many hairs a cat has. Children will find this information fascinating. I mean, did you ever expect a cat to have more than 30 million hairs? Read this and you will find out about how many blades of grass are on a football field. Goldstone ends the book by challenging students to look for other things to estimate, like cans in a supermarket and more. This book is the type of book that is interesting reading, provides a great introduction to an estimation lesson or a large number lesson as well as getting students thinking about their surroundings. Don't miss it.

Another relatively new series of books, written by Virginia Pilegard, is the Warlord series of seven books. The first book was the *Warlord's Puzzle*. (© 2000, Pelican Publishing) The book is set in ancient China. When a tile given to the Emperor is broken he offers a reward to whoever can put it back together. Needless to say there were attempts by scholars and wise men but the only one to be successful was a small peasant boy who immediately put the seen pieces back into the square. This story is supposedly an origin of the tangrams, (one of a few origins) but either way, it's a delightful story and one that tangram fanciers and children will enjoy. The illustrations are very appealing. The setting of ancient China may not be as exciting to small children but if you follow up with the book by having some time for students to explore tangrams and try to solve the problem of making a square with all seven pieces it will all tie in nicely. This is a good lesson when teaching shapes in geometry and helps students develop those visual skills.

If you are looking for another estimation book that will fascinate students then look no further than *Counting on Frank* by Rod Clement. (© 1999 Gareth Stevens Publishing) The boy in this amusing story, along with his dog, present the reader with loads of interesting problems involving estimation skills. Students will love this book for the amusing illustrations, problems presented throughout the book, and the boys reasoning in solving the problems. This is another book that can lead into many math conversations regarding the scenarios in the book.

Until next time, remember that a good book only makes a good math lesson even better. If you are looking for something specific or want sources for my book choices, feel free to e-mail me your questions or requests at judychambers100@comcast.net.
NSF-Funded Explorations of Mathematics for High-School Teachers
Department of Mathematics, UGA
June 17–July 8, 2009

There will be NSF funding for approximately 7–10 teachers to have the opportunity to learn more about the relations between geometry and algebra. This should be of particular interest to teachers in the state of Georgia who are now teaching a curriculum that is based on an integrated approach to algebra and geometry.

Title: Explorations of Algebra and Geometry.

Instructors: Professor Ted Shifrin and Mo Hendon

Dates: June 17–July 8, 2009

We will explore the interplay of algebra (particularly linear algebra) and geometry, starting with the use of vector algebra to prove many classical theorems in Euclidean geometry—some well known, others less so. We will move on to study topics such as projective geometry and computer graphics, conic sections, and the question of how many lines intersect four general (mutually skew) lines in space. In part, participants will be encouraged to do some computer explorations.

Daily work will consist of three parts: a morning lecture, collaborative problem sessions, and later afternoon group work, thinking through the integration of algebra and geometry topics in the Math 1 and Math 2 curricula. Teachers will be asked to bring their texts and class materials from this school year and to work (with guidance) on strengthening and expanding these materials for use in the future.

Funding: A stipend of at least $600/week + housing assistance if needed (housing will be at Intown Suites Extended Stay, a fully furnished efficiency)

Applications: Each applicant should submit an application to Laura Ackerley by January 23, 2009. The application can be downloaded at the University of Georgia Mathematics Department website, http://www.math.uga.edu. Please include in the application a list of math courses taught the last 5 years, a list of upper-division college mathematics courses taken, any extra information you wish us to have about you, and a 200-to-300-word “essay” on why this program is particularly of interest to you.

Questions: Please contact Ted Shifrin at shifrin@math.uga.edu
### Elementary Brain Teaser

#### From Last Issue

**For Whom the Bell Tolls**

If a clock chimes 6 times in five seconds, how many times will it chime in ten seconds?

**For Whom the Bell Tolls Solution:** 11.

The bell chimes 6 times in the first five seconds because the first chime happens at zero seconds.

#### New One!

**Bigger Than It Looks?**

Albert Newton was examining an angle measuring fourteen and one-half degrees using his magnifying glass that magnifies everything three and one-half times. Look through the glass, how large would that angle measure?

### Challenge Round

#### From Last Issue

**Nine Digits**

By arranging the digits 1, 2, 3, 4, 5, 6, 7, 8, and 9 it is possible to come up with a fraction equivalent to one-eighth. For example: \( \frac{1}{8} = \frac{3187}{25496} \)

\[ 1/8 = 3187/25496 \text{ (can you write this as a true fraction in print?)} \]

Your task is to arrange the digits 1, 2, 3, 4, 5, 6, 7, 8, and 9 and come up with an equivalent fraction to one-fifth.

**Nine Digits Solution:** one possible answer \( \frac{1}{5} = \frac{2769}{13845} \)

or 2769/13845

Other possible solutions include:

- 2973/14865
- 2697/13485
- 2937/14685
- 3729/18645
- 9723/48615
- 7629/38145

#### New One!

**Counting Sheep**

If ten sheep jump over a fence in ten minutes, how many sheep jump over a fence in one hour?
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Get Out Your Calendars, Day Planners, and PDAs

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**REFLECTIONS**

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