The Centroid

IN THIS ISSUE:

Submission of Manuscripts

We invite the submission of news, announcements, and articles useful to school mathematics teachers or mathematics teacher educators. In particular, K-12 teachers are encouraged to submit articles describing teaching mathematical content in innovative ways.

News and announcements (president's messages, award winner announcements, professional development announcements, etc.) must be received by December 1 for the spring issue and by July 1 for the fall issue.

Articles that have not been published before and are not under review elsewhere may be submitted at any time to the address below. Submit one electronic copy via e-mail attachment (preferred) or diskette in *Microsoft Word* or rich text file format. To allow for blind review, the author's name and contact information should appear *only* on a separate title page. Manuscripts should not exceed 10 pages double-spaced with one-inch margins. Figures and other pictures should be included in the document in line with the text (not as floating objects). Scannable photos are acceptable and should be large glossy prints mailed to the editor or minimum 300 dpi tiff files emailed to the editor. Proof of the photographer's permission is required. For photos of students, parent or guardian permission is required.

Manuscripts should follow APA style guidelines from the most recent edition of the *Publication Manual of the American Psychological Association*. References should be listed at the end of the article, and should also follow APA style, e.g.,

Bruner, J. S. (1977). *The process of education* (2nd ed.). Cambridge, MA: Harvard University Press.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics*. Reston, VA: Author.

North Carolina Department of Public Instruction. (1999). *North Carolina standard course of study: Mathematics, Grade 3*. Retrieved October 17, 2005, from http://www.ncpublicschools.org/curriculum/mathematics/grade_3.html

Perry, B. K. (2000). Patterns for giving change and using mental mathematics. *Teaching Children Mathematics*, *7*, 196–199.

Ron, P. (1998). My family taught me this way. In L. J. Morrow & M. J. Kenney (Eds.), *The teaching and learning of algorithms in school mathematics: 1998 yearbook* (pp. 115–119). Reston, VA: National Council of Teachers of Mathematics.

General articles and teacher activities are welcome, as are the following special categories of articles:

- *A Teacher's Story*,
- *History Corner*,
- *Teaching with Technology*,
- *It's Elementary!*
- *Math in the Middle*, and
- *Algebra for Everyone*.

Editorial Board

About the Cover

The Centroid logo is based on the following theorem: The limit of the sequence of midtriangles of a triangle is the centroid of the triangle.

Copyright

Contact Information

The Centroid

Articles

News & Information

From the Editors

Happy New Year! We hope you enjoy this issue and will consider submitting an article. Manuscripts related to the new curriculum or to successes in the classroom are especially encouraged.

- Debbie Crocker and Holly Hirst

NCCTM 2010 Spring Conference

27 February 2010 at Asheville High School

The NCCTM Board has put the regional conferences on hiatus due to declining attendance. This spring there will be a meeting in Asheville in February, and teachers from all regions are welcome to attend. Consider presenting! More information is coming soon to the NCCTM website.

http://www.ncctm.org

Around North Carolina

Pirating ARRRRrithmatic Mathematics Education Conference
What's Hip/What's Essential
East Carolina University
27 February 2010
To register for the conference, email Dr. Thompson at thompsonan@ecu.edu by February 8th

Sonia Kovalevsky Mathematics Day 2010
Workshop for High School Aged Women
Western Carolina University
20 March 2010
For more information: http://polaris.cs.wcu.edu/SKday/

Julia Robinson Mathematics Festival
For Middle School Girls
UNC-Charlotte
27 March 2010
For more information: http://education.uncc.edu/oeo/JRMF/

NCCTM 2010 Conference: Oct 28-29

Koury Convention Center, Greensboro

Consider presenting at the conference! More information about submitting an abstract is coming soon to the NCCTM website.

http://www.ncctm.org

Presidents' Messages

State President
Wendy Rich
wrich@asheboro.k12.nc.us

Greetings! On behalf of the NCCTM Board of Directors I would like to say thank you for making this past conference a huge success. We had 2,244 people to attend the conference in spite of difficult economic times. I would like to extend a personal thank you to everyone that helped with the conference; Ron Preston and Marta Johnson (Program Chairs), Pat Sickles and Judy Rucker (Conference Chairs), Vincent Snipes (Audio Visuals), Hollylynne Lee (Birds of a Feather Event), Betty Tysinger and Karen Bartlett (Commercial Exhibits), Tanya Tripp (Hospitality), Ana Floyd and Ryan Dougherty (Publicity), Tina McSwain (Troubleshooting), Kim Aiello, Shana Runge, and Melissa Wilson (Marketplace), Donna Boyles and Lisa Williamson (Registration Volunteers), Betty Long (Student Exhibits), Colonel C. Hall (Student Cadets), Rebecca Hoover (Management Services), Marilyn Preddy (Conference Services), and all of the presenters who shared their knowledge and expertise. A special thank you to NCDPI's Mathematics Consultants for taking an integral part in helping us "Zoom In: Examining What is Essential" in Mathematics! There were many, many more volunteers that assisted by passing out tickets, working registration and NCCTM booths, assisting with the awards banquet, and quite frankly, assisting me in ways I couldn't have imagined. I can't thank you enough. I never realized the man power that goes into an event this size. I truly hope everyone was able to take advantage of all that the conference had to offer.

Mathematics remains strong in our state primarily through the dedicated service of our NCCTM members. I am blown away by the amount of time our members VOLUNTEER for mathematics education each and every day. I owe a huge debt of gratitude to all of our committee members, board members, and volunteers. I am proud to serve alongside so many wonderful mathematics educators! If you would like to be more involved in NCCTM, please email me or contact your regional president. We are always looking for ways to better serve our membership.

Central Region President
Barbara McGill
motley455693@bellsouth.net

Happy New Year to the members of the Central Region of NCCTM! It was great to see you at the 2009 State Conference in October. Those of you who were unable to attend…you missed a treat, and I encourage you to contact someone who did attend for some 'goodies'…you know how we love to share! It went off like a Hollywood production! Mark your calendars for October 28-29, 2010, for the next conference. Hope to see you there. The Central Region Math Fair is scheduled for North Asheboro Middle School on March 13, 2010. Deanna Feree Wiles and Angie Kerr are co-chairs for the event. Deanna can be reached at Donna Lee Loflin Elementary School, 405 South Park Street, Asheboro or by calling 336-625-1685. Her email address is dwiles@asheboro.k12.nc.us. All areas and age groups are encouraged to participate. We would like to have a record turnout this year! The three regions of NCCTM voted to suspend the regional conferences in its usual format until alternate methods of serving the membership can be developed. Poor attendance was a deciding factor. We are soliciting ideas of ways to better serve the members. Your valuable input is needed and appreciated! Email me, subject: NCCTM Ideas for Service. I'll share these ideas with the other board members. The Central Region Board members are scheduled to meet on March 27, 2010, to discuss these concerns/issues. Good input yields good output!!!

We were fortunate to award nine mini-grants to members in our region. The ideas/projects/lessons were diverse and seemed to be challenging. The persons/groups are encouraged to carry out those plans, present at the conference, and/or write an article for the Centroid for publication as required by the grant. Any member can apply and I encourage you all to use this tool as a mechanism to communicate your ideas to the students/

teachers. It would be a neat idea to have a write-up of all nine grants for a combined publication in the Centroid. Thanks to the Board members of the Central Region and to president, Wendy Rich, who work tirelessly for teachers and students in our region and state. We commend their dedication and sincerely appreciate all that they do. See you at the Math Fair!!

Western Region President
Kathy Jaqua
kivey@email.wcu.edu

Happy New Year! I'm sure you have heard and said that phrase many times already, but I want to add my excitement for the new year. The Western Regional Officers are currently finalizing plans for a spring meeting, and we hope that many of you will consider sharing some of your wonderful teaching ideas with us.

We have set the date for that meeting, February 27, 2010, and we will meet at Asheville High School. Mark your calendars, watch your email, and check the NCCTM website for how you can participate in that meeting as a presenter or as an attendee. We expect to have many new and soon-to-be-new teachers in attendance, and we are looking for speakers who have some good ideas to share with these new colleagues. The meeting will begin a bit later this year to allow for more travel time and end in time for you to have a late lunch at one of the great places in Asheville. We will begin check-in at 9:30, with the first session to start at 10:00. There will be three sessions of about 50 minutes each with a 30 minute break for refreshments and conversation. Each session will have talks that focus on K-2, 3-5, 6-8, and 9-12 grade levels as well as more general talks. I look forward to seeing you in Asheville in February.

Where Are They Now?
Updates on Long-time NCCTM Members

DR. CLEO MEEK For many years during the 1970's, 80's, and 90's, Dr. Cleo Meek was the Assistant Director for Mathematics under Mathematics Director Dr. Robert Jones at the North Carolina Department of Public Instruction. Bob and Cleo were a magnificent team with John Ogle, Kay Kemp, and Jeanne Joyner at their sides.

While Cleo was a terrific mathematics educator, modeling and teaching us the best math education strategies, Cleo also modeled a sterling man of integrity and role model as he encouraged so many of us.

Cleo would love hearing from us. His present address is:
> Dr. Cleo Meek
> c/o Rex Rehab
> 4210 Lake Boone Trail
> Raleigh, NC 27607

Know of a long-time retired member we should highlight in the Centroid?
Send information to NCCTM President Wendy Rich <wrich@asheboro.k12.nc.us>.

Julia Robinson Mathematics Festivals
Harold Reiter
UNC - Charlotte

On Saturday, March 27, 2010, UNC Charlotte will host a Julia Robinson Mathematics Festival for middle school girls. The festival is sponsored by the Charlotte Teachers' Circle, the UNC Charlotte Math and Statistics Department, UNC Charlotte math club Pi Mu Epsilon, and the UNC Charlotte College of Education Outreach Office. Problem activity tables will be hosted by Pi Mu Epsilon members, UNC Charlotte graduate students and Davidson College undergraduates, high school members of the Charlotte Math Club, and members of the Charlotte Teachers' Circle. All students will receive a t-shirt, and lunch will be provided.

Students will earn tickets for solving problems (or perhaps just for trying hard) which they can use at the end of the day in the lottery. Prizes have been donated by www.mathartfun.com, UNC Charlotte, the American Mathematics Society, AK Peters Publishers, Casio calculators, Texas Instruments, Kenken, Zometools, and TK's Positive Shirts and Gifts. Dr. Tim Chartier and his wife Tonya will perform their very entertaining show Mimematics during the Saturday afternoon part of the program. Activities include toothpick puzzles, Zometools, including Zomebubbles, Kenken, and other fascinating puzzles and problems.

Each middle school teacher has the opportunity to name a special prize winner from among the teacher's female students based on the prize problems, some of which are listed below. Those selected will receive a special prize. See http://math.uncc.edu/~hbreiter/Robinson.htm for the complete set of problems. Students can register themselves for the festival at http://education.uncc.edu/oeo/jrmf/. Teachers and parents can also register for themselves and for their students.

The first Julia Robinson Math Festival was held in 2007. It was sponsored by the Mathematical Sciences Research Institute (MSRI) in Berkeley, California. It is designed to encourage middle school girls to investigate diverse areas of mathematics they would not ordinarily encounter in the classroom. The Festival centers on solving problems designed to both engage and intrigue, and MSRI has encouraged colleges and schools throughout the US to host Festivals of their own. For more information on sponsoring Julia Robinson Mathematics Festivals see:

<http://www.msri.org/specials/festival/>

FOUR 4'S PROBLEM. We have four copies of the digit 4 to use in this problem. The idea is to combine them in different ways to count to 100. We'll try to construct each number, 1, 2, 3, etc. up to 100 using four 4's, and when we can't construct a number, we'll allow ourselves to use five 4's. The operations we can use are the usual arithmetic operations, plus, minus, times, and divide $(+,-,\times,\div)$. We also allow ourselves concatenation, which we can use the symbol ⌢ to represent. For example, we can build the number $4 ⌢ 4 = 44$ from two 4's. Also, note that $(4 \times 4) ⌢ 4 = 164$. When there is not possible confusion, we write just 44 instead of $4 ⌢ 4$. Here are a few examples to get you started.

$$1 = 44 \div 44, \ 2 = (4\div4) + (4\div4), \text{ and } 3 = (4+4+4) \div 4.$$

Be sure you use parentheses to make your expressions clearly defined. The important thing here is to see which numbers cannot be constructed with four 4's.

SUM OF SUBSETS PROBLEM. The numbers in the set $\{1,2,3,4,5,6,...,15\}$ can be split up into four subsets so that the sum of the members of each subset is the same. One way to do this is $\{1,2,13,14\}$, $\{3,4,11,12\}$, $\{5,6,9,10\}$, and $\{7,8,15\}$. Try splitting up the 20 element set $\{-6,-5,-4,...,0,1,2,3,...,13\}$ into five sets each of which has the same sum of members.

SPECIAL-8 NUMBER PROBLEM. A special-8 number is one whose decimal representation consists entirely of 0's and 8's. For example 0.8088 and 0.08 are special-8 numbers. What is the fewest special numbers whose sum is 1.

HUGE NUMBER PROBLEM. Let N be the huge number N = 123456789101112 . . . 999 obtained by writing down, in order, the representation of the first 999 positive integers.
   (a) How many digits does N have?

(b) How many times does the digit 6 appear in N?

(c) What is the product of the 2009th digit and the 2010th digit of N?

INSERTING PLUS SIGNS PROBLEM. Plus signs can be inserted in 1 2 3 4 5 6 7 in any of six positions. For example, we could put '+' signs in the second, fourth, and sixth places to get $12 + 34 + 56 + 7 = 109$.

(a) Can one or more + signs be inserted to achieve the number 100? If so, in how many ways can this be done?

(b) Suppose either a + or a − sign MUST be inserted in each position. What are the numbers that could result?

(c) How many numbers can be achieved by putting + signs into 1 2 3 4 5 6 7?

MINE SEEKER PROBLEM. The 8×10 grid below has numbers in half the squares. These numbers indicate the number of mines among the squares that share an edge with the given one. Use this information to find the exact location of all the mines. A square can have more than one mine.

CHOCOLATE LOVERS PROBLEM. Juan and Thu are both smart chocolate-lovers. There are four bars of chocolate of sizes 250 grams, 300 grams, 400 grams and 600 grams. Juan chooses first and starts eating at a uniform (=constant) rate. As soon as Juan chooses, Thu gets to choose which chocolate bar to start on, and she eats at the same uniform rate as Juan. As soon as one of them finishes, that person chooses again and again eats at the same rate. Who gets the most chocolate? Explain how they can achieve it.

CUBE FACE PROBLEM. A rectangular block of size $3 \times 4 \times 5$ is built from 60 unit cubes. How many of the 60 cubes can be seen from the outside?

FRACTION SUM PROBLEM. Find four different digits selected from the set {1,2,3,4,5,6,7,8,9} to build two fractions each with a single digit numerator and single digit denominator so that the sum of the two fractions is less than 1 but as large as possible otherwise. Can you prove that your fraction is as large as it can be? Now suppose we want to build a pair of fractions, again using four different digits, whose sum is larger than 1 but otherwise as small as possible.

X'ING DIGITS PROBLEM. Consider the number

$$N = 1234567891011121314151617181920212223242526272829 30 \ldots 5960$$

obtained by writing the numbers from 1 to 60 next to one another. What is the largest number that can be produced by crossing out 100 digits? You are not allowed to rearrange the digits that you don't cross out.

A Teacher's Story

The Wheels on the Bus. . .A Motivator for Learning About Apportionment
Carla Rodden
Reagan High School - Winston Salem / Forsyth County Schools

The first year I taught apportionment in my Discrete Math class, it was straight from the book. Hamilton, Jefferson, Adams, and Webster all fighting through US History to garner seats for their states. As I am not a history buff, this was very dry and uninteresting for me and for many of my students. The next year, I sought ways to make the apportionment unit more engaging for my students. "The Wheels on the Bus" activity opened up new interest for my students and the posters they created were personal and relevant to them. I had students who apportioned ballet shoes to dancers based on years of dancing, NFL game tickets to fans based on online voting for best costume, and Air Jordan shoes to basketball players based on number of successful free throws. The students enjoyed adding their personal twists to the unit and gained a better understanding of apportionment problems.

Instructional Plan
1. Assign students to working groups. (Suggested: No more than 4 students per group.)
2. Introduce the activity by reading through The Wheels on the Bus… handout. Encourage students to get excited and/or make tangential comments: "Do you think they'll win?" "Who should get the bus seats?" "Who would you want as chaperones?" The more interested they are in the problem, the more they will participate.
3. Working in groups, have them determine the number of seats they would give to each group. When they are finished, they may discuss the summary questions amongst their group. If all groups have finished, you may discuss them as a class. However, no writing should take place during this phase. The questions should be answered individually and in each student's own words.
4. Assign the summary questions for homework.
5. Refer back to the Wheels on the Bus fairness exercise when introducing Apportionment from the perspective of the founding fathers trying to implement the "Great Compromise."

Extensions
1. Throughout the Apportionment Unit, use non-legislative examples in your lessons. For example: Donated Books being given to teachers based on years of service, Free Pizzas being delivered to homerooms based on number of students, etc.
2. Require students to identify the "states," "seats," and "population" in creative apportionment examples. A good explanation is that "states" are the WHO, "seats" are the WHAT, and "population" is the HOW (or "based on") to help them recognize the elements of an apportionment problem. Additionally, they can use "Seats are divided by states based on population" to help them determine the parts of the problem.
3. Have students create apportionment problems for each other. Day 1: Give everyone the same data set. Ask each student to write a "back story" for the data. Collect. Day 2: Give each student a paper other than their own. Have students solve the situation they've been given.
4. Project: Create a 12" x 20" poster of an apportionment problem. The poster should describe the back story, display the data in an easy-to-read format, identify the apportionment method used, show steps and calculations, summarize the outcome of the situation, and identify any fairness issues that the method produced, if any. Be creative and have fun!

References for Background on Apportionment

DeVilliers, M., & Nielson, L. J. (1997). *Is Democracy Fair? The Mathematics of Voting and Apportionment.* Emeryville, CA: Key Curriculum Press.

United States Census Bureau. (2010). *Congressional Apportionment – Historical Perspective.* Retrieved January 23, 2010, from http://www.census.gov/population/www/censusdata/apportionment/history.html

The Wheels on the Bus

After an undefeated season, the Raiders have made it to their first-ever State football championship! Wheels Express, a local charter bus company, has offered to donate three buses for the big game so that students can make the historic journey and support their team.

Mr. Elrod agrees to accept the offer based on a few conditions:
- Each 57-passenger bus must have exactly four chaperones on it.
- Every seat must be used on each bus.
- The buses must accurately reflect the Reagan student body.

Based on the following data, distribute the seats as you deem fair. Remember, if Mr. Elrod does not agree that it is fair, the buses will be rejected!

Year \ Gender	Male	Female
Senior	168	186
Junior	208	214
Sophomore	227	224
Freshman	257	249

GROUP WORK: Work together to determine how to distribute the seats. Show each step and explain your reasoning.

INDIVIDUAL WORK: Answer the following questions. Use complete sentences and your own words.

1) How many seats were allotted to students? How did you determine this number?

2) What "groups" should be represented? Do you agree that this would reflect Reagan's student body? What other "groups" could have been used?

3) What does it mean to be "fair"? Was this immediately clear in your group? If not describe the discussion that led to group consensus on what is fair.

4) What should be done with any leftover seats? What other options, if any, did your group consider?

5) Based on your final results, would any "group" feel cheated, or lucky? If yes. describe which groups might feel that they got too many or too few seats and why.

Problems to Ponder

Spring 2010 Problems
Gregory S. Rhoads
Appalachian State University

Grades K–2 On Dale's 5th birthday, his dad gives him an option. He will give Dale 10 cents each day for the next week, or he will give him a penny the first day, two pennies the second day, continuing to double what he gave Dale on the previous day for the next week. If Dale saves the money his Dad gives him each day for the next 7 days, which option will give Dale more money at the end of the week?

Grades 3–5 Find a pattern in the following pyramid of numbers. Determine the number that goes in the top of the pyramid that completes the pattern. You should explain the pattern in your solution.
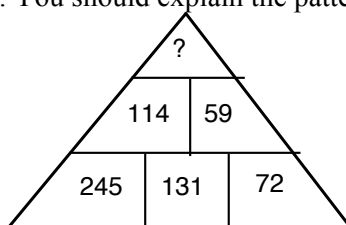
Grades 6–8 Julie has a super ball that will bounce back 1/3 of any height it is dropped from. She dropped it from the top of her school (72 feet high) onto the concrete below. How far has the ball traveled when it hits the ground for the fourth time?

Grades 9–12 The set of points that are twice as far from the point $(0,3)$ as from $(3,0)$ is a circle of what radius?

Directions for submitting solutions

1. Neatly print the following at the top of each solution page:
   - Your full name (first and last)
   - Your teacher's name
   - Your grade
   - Your school

2. Submit one problem per page.

Students who submit correct solutions will be recognized in the next issue of The Centroid. We wish to publish creative or well-written solutions from those submitted. If you would rather not have your solution published, please so indicate on your submission. Proper acknowledgement is contingent on legible information and solutions.

Send solutions by 1 June 2010 to:

Problems to Ponder, c/o Dr. Greg Rhoads
Dept. of Mathematical Sciences
Appalachian State University
Boone, NC 28608

As these problems are intended to stimulate independent thinking, it is expected that a submitted solution indicates the student completed a significant part of the work. Please try to have the students use complete sentences when they write up their solutions to promote effective communication of their ideas.

For a school assignment, Judy is to note the high and low temperatures for a particular day. At the high temperature, her thermometer appears as below:
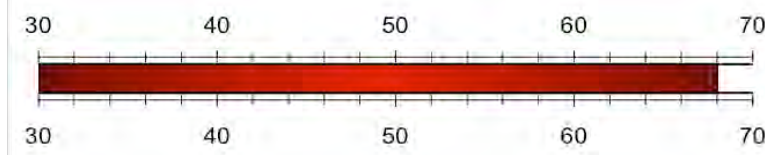
and at the low temperature, her thermometer appears as belowL
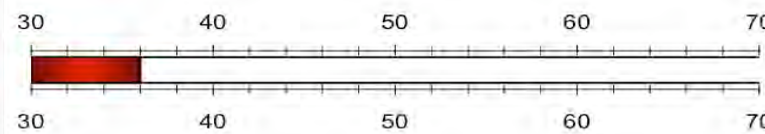
What are the high and low temperatures for that day and what was the difference between the high and low for that day (high minus low)?

Solution: by Charlotte Tannembaum, 2nd grade of **Ravenscroft Elementary** (teacher: Ms. Byrne)

Correct Solutions were received by: Caroline Wilson of **Lindley Park Elementary,** Julia Barnett, Jack Budniewski, Scott Chekan, Lizzie Cooper, James Dixon, Conor Doherty, Olivia Fu, Teagan Hackim, Amelia Holdstock, Joshua Kohn, Brianna McGarry, Lee Plummer, Caroline Rutigliano, Nikhil Sachar, Lauren Shaffer, Kieran Smith, Charlotte Tannenbaum, Justin Thompson, and Jack Thornton of **Ravenscroft Elementary.**

Order the following numbers from **smallest** to **largest**: 1, $\dfrac{8}{9}$, 0.871, the perimeter of a square with sides of length $\dfrac{1}{5}$, the value of $\dfrac{2}{3} - \dfrac{1}{4} + \dfrac{1}{2}$.

Solution: by Ben Reeve, 5th grade of **Porter Ridge Elementary** (teacher: Ms. Cynthia Chandler)

Correct Solutions were received by: Benjamin Long and Jimmy Paris of **Antioch Elementary,** Victor Yang of **Leadmine Elementary,** Trae Arthur, Anna Barber, A. J. Clarke, Paxton Dolby, Zane Gentry, Emily Payne, Chandler Price, Ben Reeve, Mickey Styne, Tessa Tarleton, Colby Underwood, Jack Vines, Gregory Weese, and Courtney Wilson of **Porter Ridge Elementary,** Scott Fey of **Sun Valley Elementary,** Allison Kauffman, Antonio Martinez, and Seth Thompson of **Teachey Elementary.**

SOLUTION: Grades 6-8 Fall 2009 issue

Find all values of x that satisfy **both** $|2x - 1| \le 5$ and $3 - x > 2$.

Solution: by Cameron Reid, 6th grade of **South Asheboro Middle** (teacher: Mrs. Salamone)

(Editor's Note: Many of the students didn't handle the absolute value correctly. Cameron set it up as a double inequality and that is probably the easiest).

Correct Solutions were received by: Laarni Lapat, Louie Lapat, Brittany Ledford, and Jonathan McDowell of **Bertie Middle**, Edward Yang of **Ligon Middle**, Bailey Allgood, Hannah Brown, Brian Conrad, Conner Criscoe, Aaron Garner, Alex Giminez, Adam Gross, Emilee Hammer, Berenise Hernandez, Heather Malin, Spencer Morgan, Alicia Peterson, Cameron Reid, and Taylor Saunders of **South Asheboro Middle**, and Heaven Edwards of **Southeast Middle.**

SOLUTION: Grades 9-12 Fall 2009 Issue

Let *T* be a rectangular solid such that the top face has area 180, the front face has area 75, and the side face has area 60. What is the volume of *T*?

Solution: by Sae Saem Han, 12th grade of **Salem Academy** (teacher: Ms. Sorrells)

(Editor's Note: Some of the correct solutions found the value for each of the 3 dimensions, then multiplied to find the volume. Sae saw he only needed to solve for the product of the dimensions and didn't need each one. This simplified things a bit.)

Correct Solutions were received by: Edward Yang of **Ligon Middle**, Esther Balogh, Kelly Borglum, Chen Chen, Hannah Deans, Daniela DeCristo, Marie Dokovova, Kylie Grady, Sae Saem Han, Mary Carol Harris, Cate Hendren, Austin Humbert, Kelly Kim, Seochung Kim, Lynn Lin, Jie Mao, Chanita Parker, Shuhan Wen, Ally Yang, Jiawen Zhang, and Emma Zhu of **Salem Academy.**

Awards

2009 Outstanding Mathematics Education Award Winners
Reported By Bampia A. Bangura
North Carolina A&T State University

Each Fall NCCTM selects three Outstanding Mathematics Education Students, one from each region. All nominees receive a certificate and a one-year membership in NCCTM. Top award winners are recognized with a plaque and a check for $100 during the awards program at the State Conference.

The 2009 Recipients are: LLOYD JACKSON GLASGOW from East Carolina University in the Eastern Region; DONALD THOMPSON II from North Carolina A&T State University in the Central Region; and JAYMI MICHELLE JEFFERY from Western Carolina University in the Western Region.

LLOYD JACKSON GLASGOW is a senior at East Carolina University, completing a BS in Mathematics Education, a BA in Mathematics, and a minor in Economics. Jackson is very active in mathematics and mathematics education activities at ECU. He has served as Vice President of the ECU Chapter of NCCTM since January 2009. He presented "Strategies for playing Mancala" at a chapter meeting. Jackson has proctored the ECU Mathematics Contest and has developed a weekly Upper Level Mathematics Study Group at ECU. He is a member of many other campus organizations: the Phi Eta Sigma Honor Society, National Collegiate Scholars, East Carolina Scholars Program, ECU Honors Council, and ECU Scholar selection committee, to name a few.

In addition to his many campus involvements, Jackson has also participated in several community activities, including the East Carolina Relay for Life, Belvoir Tutoring Program, Habitat for Humanity, and as the recreation director for Vacation Bible School. According to one of Jackson's professors, " Jackson shares an enthusiasm for Mathematics teaching and learning. You can count on Jackson to be professional in his appearance, in his speech, in his conversation, and in his demeanor." Jackson has great promise as an outstanding teacher and an outstanding leader in Mathematics Education.

JAYMI MICHELLE JEFFERY was a senior at Western Carolina University who graduated in December 2009 with a BS Degree in Mathematics concentrating in Mathematics Education. Jaymi has been involved in many aspects of the mathematics and mathematics education program. She served as a student assistant in the Western Carolina University's Mathematics Contest in 2008 and 2009. She served as student clerical assistant in the Department of Mathematics and Computer Science during that time as well. She has begun a collection of Mathematics textbooks which serves as a core for a professional library. In Spring 2008 she has presented a talk at the Fourth Annual Smoky Mountain Undergraduate Conference on the History of Mathematics. She presented a poster at the Southeastern Conference of the MAA in March 2008. She served as a mathematics tutor in the Resource Center and as the vice-president of the NCCTM Student Affiliate at WCU. Jaymi is also very active in other areas of the department and in numerous University wide activities.

As a consequence of her strong academic record, Jaymi has earned the dean's List Status each of the semesters she completed at WCU. Jaymi is a leader of Mathematics and will soon be an outstanding teacher of mathematics.

DONALD THOMPSON II is a senior at the North Carolina A&T State University in Greensboro. A North Carolina Teaching Fellow, he is pursuing a BS Degree in Mathematics Secondary School Teaching. Donald has been involved in many activities of the department. He has served as Treasurer of the student chapter of the MAA and president of the NCCTM chapter at NC A&T State University. He served as a student assistant in the NCA&T State University's Mathematics Contest for 2008 and 2009. Donald represented the NCA&T State in the NCCTM Pre-Service Panel Discussion at the NCCTM Fall conferences in 2007 and 2008. Since his admission to the University, Donald has shown that he is not only an academic, but a student who is willing to be engaged in numerous other activities, including tutoring fellow students as a site director for the Service Mentoring Academics Responsibility Teamwork Tutorial Program; Working as a Teaching Fellow Student Office Assistant; recruiting students for the Mathematics and the mathematics Education Programs; Acting as Treasurer of the Alpha Chi Honor Society; and Mentoring for the Honors Program.

Donald also participates in several community/civic activities including the Salvation Army, Urban Ministries, Habitat for Humanity, and the March of Dimes. He has also participated in two Undergraduate Research programs on Campus and is currently involved in the University of Maryland Spiral program. He is constantly seeking opportunities to enrich himself and other students in the department. He has always been on the Dean's List since he entered NCA&T State University. He is dedicated to the study and teaching of mathematics.

Mini-grants

Through its mini-grant program, NCCTM provides funding for North Carolina teachers as they develop activities to enhance mathematics education. This program will provide funds for special projects and research that enhances the teaching, learning, and enjoyment of mathematics. There is no preconceived criterion for projects except that students should receive an on-going benefit from the grant. The mini-grants are awarded by each of the three regional organizations to members ***within their geographic boundaries*** (If you incorrectly identify with the region, your proposal will be ineligible for funding). A total of $15,000 is available each year for mini-grants, with each region awarding approximately $5000 in grants to its members. In recent years, approximately 30-35 proposals have been funded, for an average grant of just less than $800.

Grant proposals must be postmarked or emailed by September 15, and proposals selected for funding will receive funds just after the state conference. You will receive an email confirmation of receipt of your proposal. If you do not receive a confirmation within one week, it is your responsibility to follow-up with the Mini-grant Coordinator.

Directions
The directions and application are available on the NCCTM website <http://www.ncctm.org>. Please read all directions carefully, and fill out the application and cover sheet completely. Failure to correctly list the NCCTM region and membership number will cause your application to not be considered. Be sure that your NCCTM membership is current and active for the upcoming year! Each year we have applications that cannot be considered because of the membership requirement.

Congratulations to the Most Recent Mini-grant Recipients!

Eastern:

Christie Wuebbles, Fike High
Brenda Griffin, Southeast Elementary
Sheryl Bauer, Chadbourn Elementary

Jennifer L. Graham, Gallberry Farm Elementary
Lois Barrett, Bethel School
Shirley Braxton, William H. Owen Elementary

Central:

Teresa Turner, Archdale Elementary
Holly Dunn, Coleridge Elementary
Kimberly Hughes, Woods Charter School
Sammie Julian Norris III, McCrary Elementary
Kristin Bedell, Efland-Cheeks Elementary

Judi Cagle, Farmer Elementary
Tracy Horton, Francisco Elementary
Penny Willard, Francisco Elementary
Kristin Weyman, New Market Elementary

Western:

Celina C. Jackson, Belmont Central Elementary
Ann Harrelson, John Chavis Middle
Deanna Berrier, Traphill Elementary
Ken Thwing, Freedom High

Shannon Fields, Issac Dickson Elementary
Barbara Heufel, Mountain View Elementary
Donna Trick, Rockwell Elementary

Awards

2009 W. W. Rankin Award Winners
Reported By Lee Stiff
North Carolina State University

At its 39th Annual State Mathematics Conference held in Greensboro on 29-30 October 2009, the North Carolina Council of Teachers of Mathematics (NCCTM) presented MS. JANE EDWARDS TIMMERMAN, formerly an Elementary Program Specialist in Mathematics for the Winston-Salem/Forsyth County Schools and DR. HAROLD B. REITER of the University of North Carolina at Charlotte with the W. W. Rankin Memorial Award for Excellence in Mathematics Education. The Rankin Award is the highest honor that NCCTM can bestow upon an individual.

JANE EDWARDS TIMMERMAN was recognized for a 35-year career in which she gave so much to the profession. During her career she was a high school math teacher, a K-12 Math Program Manager, the Director of the Eisenhower Professional Development Program for Winston-Salem/Forsyth County Schools, and a Co-Director of the National Science Foundation project, SciMax, for which she created 3-8 grade pacing guides and worked tirelessly to provide leadership and support to the teachers of Winston-Salem/Forsyth County Schools.

Ms. Timmerman was also honored because of her outstanding service to NCCTM and the math teachers of North Carolina. During the early years of the organization, she was known to be one of "the essential cogs" that made NCCTM run. She served several terms on the NCCTM Board of Directors, chaired numerous committees for regional and state-wide conferences, chaired the NCCTM Mini-grants committee that supported teacher innovation, and was a frequent speaker at regional and state conferences.

Of Ms. Timmerman it was said, "She is passionate about mathematics and demonstrates a strong conviction for quality instruction. She believes that all students can learn mathematics if teachers are provided quality staff development with a focus on appropriate curriculum, on-going assessment, innovative teaching strategies, and insightful uses of technology."

HAROLD B. REITER was recognized as a scholar of mathematics and mathematics education for his more-than 40 years of service to the profession. In 1988, he was awarded the Excellence in Teaching Award by UNCC, and in 1997, he received the Distinguished College or University Teaching Award by the Southeastern Section of the Mathematics Association of America. He has written more than 60 articles and reviews in math and math education publications, and is a frequent presenter at state and national conferences.

Dr. Reiter is perhaps best known for his outstanding service to the state, national, and international mathematical communities for his work with mathematics competitions. He has made significant contributions to the Educational Testing Service, Math Counts, the USA Olympiad, and the World Federation of Mathematics Competitions during his career.

Of Dr. Reiter it was said, "He is most deserving of the Award because of his long and dedicated career devoted to the betterment of mathematics education in the state. This is a man who has given so much to so many for so long."

2010 NCTM Annual Meeting
San Diego CA – April 21-24

Rejuvenate your teaching strategies and collaborate with some of the best minds in the mathematics education field. The NCTM 2010 Annual Meeting is one professional development opportunity you don't want to miss.

<http://www.nctm.org/conferences/content.aspx?id=23209 >

Rankin Award Nominations

The Rankin Award is designed to recognize and honor individuals for their outstanding contributions to NCCTM and to mathematics education in the State. Presented in the fall at the State Mathematics Conference, the award, named in memory of W. W. Rankin, Professor of Mathematics at Duke University, is the highest honor NCCTM can bestow upon an individual.

> If you have nominated someone in the past who has not received the award to date, or if you would like to nominate someone new, please submit as much of the following information as possible!
> Nominations are accepted at any time.

Please submit the following information. Use as many typewritten pages as needed. If possible, attach a vita of the nominee.
- Name of the nominee
- Current position
- Your relationship to the nominee (e.g. principal, co-worker, etc.)
- The nominee's contributions to mathematics education, NCTM, NCCTM, etc. (Please include information on specific offices held and honors received by the nominee.)
- Any information about contributions to the community, teaching, and education that would be of value to the Rankin Award Committee in its deliberations
- Other relevant information
- Letters of endorsement from other colleagues may be included.
- Date of nomination

Nominator*   Name
              Current position; Business or educational institution
              Preferred mailing address; Preferred telephone number

*The Rankin Award Committee reserves the right to use portions of nomination information in the presentation of the award if the candidate is selected.

Send to: Lee V. Stiff
               326-D Poe Hall, Box 7801
               North Carolina State University
               Raleigh, NC 27695-7801
               Sending information in the form of emails is okay: lee_stiff@ncsu.edu

NCTM Professional Development

Pre-K to 6 Illuminations Summer Institute 2010

Looking for a great professional development opportunity? Applications are now being accepted for the 2010 Illuminations Summer Institute (ISI). ISI brings together extraordinary teachers who will receive professional development seminars and guidance on lesson development from NCTM staff.

NCTM will invite up to six educators from grades pre-K to 6. Applicants must be current NCTM members and must have experience as a classroom teacher. The lessons developed will be expected to be at the pre-K to 6 grade level. The online application deadline is Thursday, May 6th.

<http://iem.nctm.org/link.php?M=2055836&N=428&L=309&F=H>

Awards

Innovator Award Nominations

The North Carolina Council of Teachers of Mathematics accepts nominations for the Innovator Award at any time. The purpose of this award is to recognize and reward individuals or groups who have made an outstanding and noteworthy contribution to mathematics education and/or NCCTM by having founded, initiated, pioneered, or developed some program in mathematics education of service to a geographic region of the state or the entire state. Further, this program must have been sustained for a period of at least three years. A number of organizations have made significant contributions to mathematics education in North Carolina; the Committee encourages the nomination of organizations as well as individuals. Any NCCTM member may submit nominations by sending in the form below. Nominations will be retained in the active file for at least three years.

NOMINATION FORM

Name of Nominee: _____

Present Position: _____

Outstanding contributions to mathematics education in North Carolina that serves as the basis for this nomination:

Additional information that would be of value to the selection committee:

Signature: _____ Date: _____

Name (print/type): _____

Position: _____

Business or Institution: _____

Address: _____

Phone: Business _____ Home: _____

Email: _____

Send to: Philip Johnson
          Math and Science Education Center
          Appalachian State University
          Boone, NC 28608

Donating to the Trust Fund

If you wish to memorialize or honor someone important to you through a donation to the NCCTM Trust Committee, please send your donation to:

Rebecca Hoover, NCCTM Business Manager

P.O. Box 4604

Cary, NC 27519

Contributions (checks) should be made payable to Pershing LLC for the NCCTM Trust Fund. Please provide the name of the person being honored or memorialized through the donation and the name and address of the person that NCCTM should notify of your gift. For more information, contact John Kolb, Trust Fund Chair.

Puzzles

Futoshiki

Place the digits 1, 2, 3, 4, 5 in the cells so that each row and column contains each digit once, and all of the inequality symbols are satisfied.
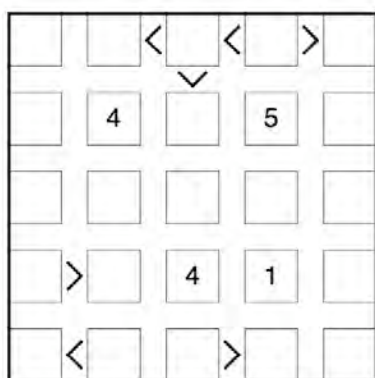
www.sudoku-puzzles.net
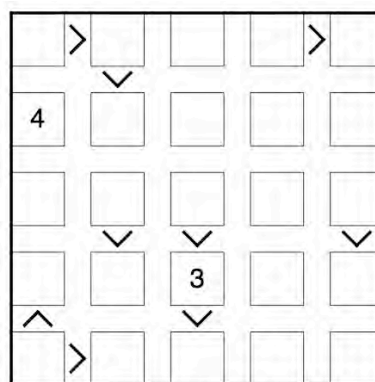
www.sudoku-puzzles.net

Sudoku <http://www.websudoku.com>

Place the digits 1 through 9 in the cells so that each row, column and 3x3 sub-grid lists each digit only once.

KenKen <http://www.kenken.com>

Place the digits 1 through 5 in the cells so that each row and column lists each digit only once, and so that each outlined block totals to the given number using the given operation (in any order).

Solutions are posted on the Centroid page .

NCCTM Trust Fund Scholarship
North Carolina Council of Teachers of Mathematics

$600 scholarships are available from NCCTM to financially support North Carolina teachers who are enrolled in graduate degree programs to enhance mathematics instruction.

Applicants must be:
- Currently employed as a pre-K - 12 teacher in North Carolina;
- Currently an NCCTM member (for at least one year) at the time of submitting this application;
- Currently enrolled in an accredited graduate program in North Carolina;
- Seeking support for a mathematics or mathematics education course in which they are currently enrolled or have completed within the previous four months of the application deadline.

Applications will be reviewed biannually, and the deadlines for applications are:
- **March 1**
- **October 1**

Send completed applications to:
NCCTM Trust Fund Chair
1302 Oakview Dr.
Greenville, NC 27858

Direct inquiries to:
Robert Joyner, Chair
phone: (252) 756-6803
e-mail: rjoyner3@suddenlink.net

(Please print all information.)

PERSONAL INFORMATION:

Name: _____

Home address: _____
Street

_____ , NC _____
City   Zip

Home phone: _____ Home e-mail: _____

NCCTM membership number: _____

EMPLOYMENT INFORMATION:

How many years of teaching experience? _____

Currently employed in what school system? _____

School name: _____

School address: _____

School phone: _____ School e-mail: _____

Current teaching assignment: _____

Principal's name: _____

COURSE INFORMATION: (One course only)

Institution of higher education: _____

Graduate degree program in which you are currently enrolled: _____

Course name:_____ Course number: _____

Dates of enrollment: *(circle one)* Fall semester   Spring semester   Summer session Year: _____

Name of course instructor: _____

PROFESSIONAL ACTIVITIES WITHIN PAST 5 YEARS WITH EMPHASIS ON ACTIVITIES RELATED TO MATHEMATICS EDUCATION:

BRIEF STATEMENT OF FUTURE PROFESSIONAL GOALS:

REQUIRED SIGNATURES:

Applicant signature: _____ Date: _____

Principal's signature: _____ Date: _____

Instructor signature (if currently enrolled): _____ Date: _____

REQUIRED ATTACHMENTS:
Please attach a copy of
1. A letter of acceptance to an accredited graduate program in North Carolina;
2. Official verification of enrollment in the graduate course described in the COURSE INFORMATION above if the course is currently being taken, **OR** official transcript containing the grade awarded to the applicant if the course described in the COURSE INFORMATION above has been completed.

NOTE: Applications must be complete to be considered. If your application is approved, an official course grade report must be submitted to verify successful completion of the course before scholarship funds will be issued.

Internal Revenue Information for Grant Recipients: Please be aware that NCCTM is required to report all grants of $600.00 or more to the Internal Revenue Service. In such a case you will receive an IRS Form 1099-MISC from NCCTM. However, you should be able to avoid the payment of any income tax on this. NCCTM has been advised that, if you receive one of the NCCTM grants, you must include the grant proceeds in income unless you made a binding commitment to have the proceeds paid directly to the sponsoring school.

NORTH CAROLINA COUNCIL OF TEACHERS OF MATHEMATICS

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Name: _____   Home Telephone: (____) - _____

Address: _____   School Telephone: (____) - _____

City: _____ State: _____ Zip: _____ E-mail: _____

School System: _____

MEMBERSHIP STATUS
❏ New ❏ Former/Renewing Member # _____

POSITION
❏ Teacher
❏ Department Chair
❏ Supervisor/Administrator
❏ Full-time College Student
❏ Retired
❏ Other _____

LEVEL
❏ K-3
❏ 4-6
❏ Junior High/Middle School
❏ Senior High
❏ 2-Year College/Technical
❏ 4-Year College/University

MEMBERSHIP DUES
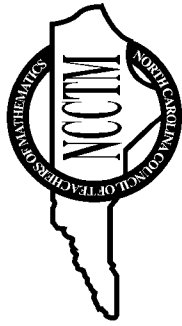|		
❏ 1 year:	$20.00	_____
❏ 3 years:	$50.00	_____
❏ Full-time Student:	$10.00	_____
❏ Contribution to Trust Fund:		_____
Total Payment Enclosed:		_____

Payment by ❏ Check ❏ Visa ❏ MasterCard

Card # _____

Exp. Date _____

Signature _____

Please make your check or money order payable to NCCTM. Send this form and your payment to NCCTM
P.O.Box 4604
CARY, NC 27519
Payments by credit card may be mailed or faxed to
919-859-3342

North Carolina Council of
Teachers of Mathematics
PO Box 4604
Cary, NC 27519