



Wahpe Woyaka pi

(T a l k i n g L e a f)

South Dakota Council Teachers of Mathematics Newsletter

Presidential Ponderings

1984-Michael Jackson had the most popular song with "Beat it", the Cosby show premiered, and sadly (or happily) I had a full head of hair. Why am I revisiting these facts? It is also the last time that SDCTM raised the membership fees. I realize that South Dakota has the lowest teacher salaries in the nation, but we have still been getting a great deal.

Even with the raise in membership fees, we are still getting a great deal. The elementary membership is not being raised. Why are we raising the membership fees at this time? Basically it is purely finances. Over the past couple of years, we haven't been able to do some of the activities that we have wanted to engage.

Two projects that SDCTM is undertaking are a revision to the constitution and revision of our position statements. The reason that we started the revision process for the constitution is so the president of SDCTM and SDSTA don't start their terms at the same time. This is to help with the transition of leadership with our joint conference.

In light of K-8 curriculum focal points, SDCTM needs to comment and have our position statements revisited. It has been almost 10 years since our last position statements were written. We are in need of members to help with these one day projects. This is a great way to get more involved with your organization. You can contact me at William.gripentrog@k12.sd.us if you would like to help your organization.

It has now been 2 months since our annual conference. If you missed it, you missed a great conference, a standard that we plan to build on for next year. A great conference starts with people. If you missed this year, schedule time right now for next year. The dates are Feb 7-9.

Bill Gripentrog
SDCTM President

U.S. Department of Education is Launching FREE Website for Teachers

The U.S. Department of Education is pleased to announce the newly remodeled and updated Federal Resources for Education Excellence (FREE) website. It now provides richer, more expansive resources to teachers and students alike. There are over 1500 resources to take advantage of at FREE, ranging from primary historical documents, lesson plans, science visualizations, math simulations and online challenges, paintings, photos, mapping tools, and more. This easily accessible information is provided by federal organizations and agencies such as the Library of Congress, National Archives, NEH, National Gallery of Art, National Park Service, Smithsonian, NSF, and NASA. Check it out today at <http://www.free.ed.gov>

SPRING 2007

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Calendar Notes:

- *PAEMST Applications due May 1, 2007*
- *SDCTM/SDSTA Joint Conference February 7-9, 2008*



These are EXACTLY the concepts that SDSU calculus instructors have identified as being the biggest barriers to their students' success in calculus in recent years.

*Kurt Cogswell is the Mathematics Department Head at SDSU.
Contact him at:
kurt.cogswell@sdstate.edu*

The SDSU Calculus I Gateway Exam: What and Why?

Many good students come to SDSU and other universities intent on pursuing one of the many excellent career paths that require knowledge of calculus, but dramatically underperform their potential in calculus because of their lack of fundamental algebra and trigonometry skills. To address this problem, SDSU will start administering the SDSU Calculus I Gateway Exam to all Calculus I students during the Fall 2007 semester.

To construct this Gateway Exam, the faculty of the SDSU Department of Mathematics and Statistics compiled a short, very well-defined list of specific algebra and trigonometry concepts that students should master if they want to succeed in university calculus. It is this concept list upon which the Gateway Exam is based. It is our hope that this concept list and the associated Gateway Exam will benefit two sets of people:

- Students who will take an SDSU calculus course, by giving them a very well-defined set of concepts which, if mastered, will significantly enhance their chances of succeeding in calculus and thus in the career of their choice, and;
- South Dakota's K-12 mathematics instructors, for whom we hope this concept list and the associated Gateway Exam will serve as a tool they can use to motivate their students to master the concepts involved.

For K-12 mathematics instructors who want to use this Gateway Exam as a motivational tool for their students, it's worth pointing out a couple of key facts:

- The topics on the concept list were not chosen arbitrarily. These are EXACTLY the concepts that SDSU calculus instructors have identified as being the biggest barriers to their students' success in calculus in recent years. Students starting calculus with mastery of these concepts will have a much easier and more successful calculus experience than those without such mastery.
- The SDSU mathematics curriculum is constructed in consultation with representatives of the professions that offer many of the best career paths available to students today, including financial services, biotechnology, statistics, engineering, and the sciences. Experts in these fields have told us what they need students who take our mathematics and statistics classes to know, and it is this that in large part helps form our curriculum. Thus, if a concept appears on our Gateway Exam concept list it is because students who want to pursue careers in these fields need to have mastery of the concept.
- The specification that the concepts be mastered without the use of a calculator is very intentional and very important. These concepts are so basic that they must be completely internalized by students in order that they may form part of a student's thought process when solving a problem in calculus.

More information on the SDSU Calculus I Gateway Exam and its associated concept list is available at <http://teach.sdstate.edu/users/vestals/Gateway.htm>. Here you will find:

- The Gateway Exam concept list.
- A sample Gateway Exam
- Answers to the sample exam
- Complete solutions to the sample exam
- Links to online resources for reviewing algebra and trigonometry

Finally, please note that the exam and website are intended to be a work in progress. We want it to be a useful tool for South Dakota's K-12 mathematics students and instructors, and welcome your feedback regarding ways to improve its usefulness. Please send your feedback to Kurt Cogswell at kurt.cogswell@sdstate.edu.



Grant & Recognition Opportunities for Teachers and Schools

Below is an abbreviated list of various grant and recognition opportunities through selective Federal Agencies to which teachers and schools can apply. There is more than \$1,000,000 for outstanding science and math teachers! For a much more complete list including descriptions, visit:

<http://www.eschoolnews.com/erc/funding/ongoing.cfm>

Grant Title: Presidential Awards for Excellence in Mathematics and Science Teaching
Organization: National Science Foundation

Grant Title: Invent America! Contest for Students
Organization: United States Patent Model Foundation

Grant Title: Computers for Learning
Organization: The federal government

Grant Title: CyberLearning Matching Grants
Organization: National Education Foundation

-NEW- Grant Title: SunWise School Program
Organization: U.S. Environmental Protection Agency

Grant Title: The GLOBE Program
Organization: The National Science Foundation

Grant Title: The Upward Bound Program
Organization: U.S. Department of Education

Free Worksheet Generator for Teachers

ALS Offers Free Worksheet Generator
Accurate Learning Systems, the developer of MathScore, has released a new, free tool for educators called Math Worksheet Generator (MWG). As its name implies, MWG is a tool for creating customized math practice worksheets. It's available now.

<http://www.mathscore.com/math/free/worksheets/freeMathWorksheetGenerators.html>

There is more than \$1,000,000 for outstanding science and math teachers!

Free tool for creating customized math practice worksheets.



Japan Fulbright Memorial Fund Teacher Program

Shannon Kortan, 8-12 Mathematics teacher at Gettysburg School District in Gettysburg, SD, recently returned from an 18 day trip to Japan, courtesy of the Japan Fulbright Memorial Fund Teacher Program and the government of Japan. She and 199 other teachers from the US spent time in both Tokyo and Hiroshima City during their stay.

*Apply online at
www.iie.org/jfmf*

Mrs. Kortan was selected from a national pool of over 2300 participants by a panel of educators to earn this honor. The program allows distinguished primary and secondary school educators in the U.S. to travel to Japan for three weeks in an effort to promote greater intercultural understanding between the two nations.

While in Tokyo, time was spent meeting with Japanese government leaders, university presidents and professors, and other Japanese officials, along with a practical orientation to Japanese life and culture.

*Shannon Kortan,
Gettysburg 8-12
Math teacher, was
selected from a na-
tional pool of over
2300 participants.*

Mrs. Kortan then traveled with 19 other educators to Hiroshima City, Hiroshima where time was spent visiting an elementary school, a junior high school, and a high school. Participants were treated to programs put on by the students and were allowed direct interaction with teachers, students, and administrators in each of the schools. She also visited some cultural sites in Hiroshima, including the Peace Memorial Museum and Park.

The Japan Fulbright Memorial Fund, based in Tokyo, oversees all aspects of the Teacher Program, sponsored by the Government of Japan and was launched in 1997 to commemorate the 50th anniversary of the US government Fulbright Program. Although the application date for 2007 has passed, primary and secondary school educators throughout the US can apply to take part in one of the two trips to Japan scheduled in 2008. For more information, please refer to <http://www.fulbrightmemorialfund.jp> or call 1-888-527-2636 or email jfmf@iie.org. Mrs. Kortan gave a presentation about her experience at the SDCTM/SDSTA Joint conference in February. If you are interested in more information or you can email her at shannon.kortan@k12.sd.us.

Do you know a Math HERO?

Help us recognize a Math Hero...there are many around the state! Tell us about people you know who make a difference in math education. Include what they are doing now as well as a short biography.

*Please submit articles with or without photos to:
smcquade2@sfcss.org*



Teachers Recognized for Outstanding Teaching Innovation Awardees To Be Announced in Spring 2007 in Washington, DC

Washington, DC Brenda Danielson, a mathematics teacher from Scotland Elementary School in Scotland, South Dakota and Sandra Ullrich, a mathematics teacher from Lincoln Elementary in Aberdeen, South Dakota have been named a state finalist for the 2006 Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST), the nation's highest honor for K-12 teaching in these fields.

Established by Congress in 1983, and administered for the White House by the National Science Foundation, the PAEMST program identifies outstanding mathematics and science teachers from each of the 50 states and four U.S. jurisdictions. The jurisdictions are Washington, DC, Puerto Rico, Department of Defense Schools, and the U.S. territories as a group (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands). Each state and jurisdiction can select up to three mathematics and three science teachers as state finalists. From this field of state finalists, a maximum of 108 Presidential Awardees are selected. Recipients of the 2006 Presidential Awards will be announced during a week of celebratory events this spring in Washington, DC.

"There are so many wonderful teachers in every school. I feel so honored to have been selected as a state finalist. It's pretty exciting!" said Danielson when she was named a state finalist. Danielson is one of the 2 South Dakota mathematics state finalists for the 2006 Presidential Award.

"I want my classroom to be a dynamic place of curiosity, interest, and excitement. I want it to be a place where every child feels loved, important, and valuable. I want it to be a place children want to come because they'd be afraid they would miss something if they were absent. Then I feel that students will be able to learn and grow."

"The Presidential Awards is one way of honoring outstanding teachers for the excellent work they do each year in helping to keep the United States competitive globally in mathematics and science," said Celestine H. Pea, Ph.D., Program Director of Elementary, Secondary, and Informal Education programs at the National Science Foundation. "They have the knowledge, skills, commitment, and determination to bring out the best in their students. Evaluation results show that teachers who receive the Presidential Award use that recognition, honor, and award funds to grow professionally and to help improve teaching and learning of mathematics and science in their schools, districts, and states by taking on the roles of leaders, mentors, and scholars in their communities.

Previous South Dakota Awardees have become leaders on the state mathematics standards writing committees, other committees at the state level, national committees for the National Science Foundation and leaders in the South Dakota Council Teachers of Mathematics.

The 2006 Presidential Awardees teach Kindergarten-6th grade. Nominations and applications are currently being accepted for 7-12th grade teachers for the 2007 Presidential Awards. Nomination forms and instructions are available at www.paemst.org.

Awardees will receive a citation signed by the President, a paid trip to Washington, DC, to attend a week-long series of recognition events and professional development opportunities, and \$10,000 from the National Science Foundation. More information can be found at www.paemst.org.

*Elementary
Teachers
Selected as 2006
Presidential
Award State
Finalists*



ARML is an annual event which gives students an opportunity to compete against (and socialize with) the finest mathematics students across the country.

Do you have a favorite site you'd like to share?

South Dakota ARML (American Regions Math League)

As a “former coach” for the South Dakota ARML (American Regions Math League) team, I am looking for others who might be interested in taking over. ARML is an annual event which gives students an opportunity to compete against (and socialize with) the finest mathematics students across the country. ARML has been running for over 30 years and now includes teams from almost every state and even some international representation.

In the past, we have taken a team from South Dakota to the University of Iowa for the competition, which is traditionally held the Saturday after Memorial Day. There are 15 students on a team, with any extras being combined with students from other states so that everyone gets a chance to compete. There are a variety of ‘events’ including individual questions, relay questions, and a collaborative event involving proofs.

The main work for a coach is to recruit students to participate, and arrange for the logistics of the trip. The fee for participation is \$300 per team and \$55 per student, which does cover lodging on Friday evening before the competition and two meals. There are some funds available to subsidize attendance. Team applications are due May 10th.

For more details on ARML, see www.arml.com. I would be happy to talk with anyone who might be willing to serve as an ARML coach. I have gone several times, but not for a number of years, and would like to see this revived if possible. Although I cannot go this year, I could help with some of the arrangements. Please e-mail me at micatala@dwu.edu or call 605-995-2669 if you are interested. I would love to talk with you!

Mike Catalano, professor of mathematics, has been a member of the DWU faculty since 1992.

Links of Interest

The link below has several educational websites including a site that can assist you in setting up your own rubrics based on what you would grade/score.

<http://www.bhsu.edu/education/edfaculty/lturner/index.html>

Submit links to:

smcquade2@sfcss.org (to be included in the newsletter)

and to:

cindy.kroon@k12.sd.us (to be posted on SDCTM's webpage)



Multi-blade Fever Grips Schick, Gillette!

Moore's Law for Razors?

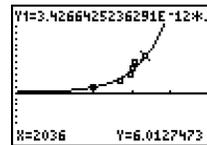
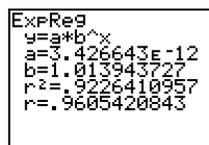
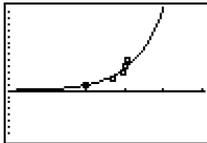
Shaving technology is proliferating at an alarming rate! From its humble beginnings in 1901, King Gillette's safety razor has evolved into a multi-bladed marvel. The recent introduction of the Gillette *Fusion* with its five-bladed shaving head causes consternation. Where will it all end?

Year	Razor	Blades
1901	Gillette Safety Razor*	1
1970	Gillette Trac II*	2
1998	Gillette Mach 3*	3
2003	Schick Quattro**	4
2006	Gillette Fusion*	5

*By the year
2239,
projections are
for a 100-bladed
model. Just in
the nick of time!*

Cynical shavers point to marketing as a driving force, while mathematicians ponder.

Although 69 years elapsed between the introduction of the first safety razor and the Trac II, only 28 years separate the Trac II from the Mach 3. The trend appears to be ever accelerating. Consider the results as time is plotted vs. number of blades. The data is revealing. Fitting an exponential model to the data allows projections to be made.



Consumers should expect a six-bladed razor (the Hexx?) sometime in late 2035, and a ten-bladed style in 2073. By the year 2239, projections are for a 100-bladed model. Just in the *nick* of time!

Cindy Kroon, Montrose High School
cindy.kroon@k12.sd.us

* http://en.wikipedia.org/wiki/Global_Gillette

** CustomerService@schick.com



Literature Corner

By Samra Trask

Samra teaches Title 1 math to grades K-8 at Wall School. Contact her at Samra.Trask@k12.sd.us.

*My favorite books,
however, are those
in which the
lessons aren't
transparently
masquerading
as prose.*

Children's picture books are not just for entertainment any longer. There are innumerable books available today that can enrich a child's mathematical understanding. Any Literature-in-Math aficionado worth his or her salt has heard of the classic Math Curse by Jon Scieszka or any of the Gregory Tang works such as The Best of Times and The Grapes of Math, to name just a few. These and dozens more classic children's math books belong in your mathematics library along with those dusty tomes you keep expecting to use as resources. (Any day now someone will surely ask to borrow that \$200 calculus book that you can't bear to part with.)

I love reading these books and my students love listening to them. I have heard students comparing the relative merits of Lady Di of Ameter and her short but resourceful son Radius whom they met in Sir Cumference and the First Round Table by Cindy Neuschwander. The lessons to be found are blatant but delightful nonetheless.

My favorite books, however, are those in which the lessons aren't transparently masquerading as prose. These are the volumes in which the math is so hidden that the authors themselves aren't fully aware of the richness of the mathematical content they are offering these fertile young minds.

The First Marathon: The Legend of Pheidippides by Susan Reynolds is a delightful picture book, which would enhance any library. On the surface it is a history lesson about young Pheidippides and his run from Athens to Sparta to bring help for the upcoming war. He runs to Sparta and then back again before joining the battle and fighting all day with the Athenian army. When the battle is over he is asked to return to proclaim the news. Khirete! Nikomen! (We have won!) The strenuous activity of his day was too much for him and he dropped over dead.

I recommend reading this book aloud to the students in history or social studies class. You would be amazed at the discussions which could arise. This story took place in 490 B.C. *How many years ago was that? What a fabulous introduction into negative integers!* Not only did this young man run the 140 miles to Sparta, he ran back again, ran 25 extra miles to Marathon, and then ran back to Athens. *How many miles was that?* It takes a car two or three hours to drive from Athens to Sparta over the mountains but it took Pheidippides almost thirty-six hours. *Can you set these up as unit rates to compare the speeds?* The Athenian army was vastly outnumbered. For every soldier from Athens, there were four soldiers from Persia. *How about working with proportions?* At the end of the battle sixty-four hundred Persians were dead while fewer than two hundred Athenians had been killed. *And more proportions!*



A section has been added to this book detailing the history of the modern day marathon starting at 24.8 miles in 1896 and evolving to its present day 26.2 miles. *Build a time line.* Much data has been added about finishing times through the years. *Find people in your community that have run a marathon. Believe me; they are obsessive about keeping data. Imagine the statistical work possible!* My personal favorite is the urban legend about the runner from England that decided to run 26.2 only to realize the distance was referring to miles instead of kilometers. *How many miles did he think he was going to run? How many miles did he have remaining when he had run 26.2 kilometers?*

There are countless other math topics in this captivating children's book. It is a wonderful opportunity to bring the math out of the math class and into the light of day. Enjoy!

The First Marathon: The Legend of Pheidippides

- Author: Susan Reynolds
- Illustrator: Daniel Minter
- Reading Level: Ages 4-8
- Publisher: Albert Whitman and Company
- Copyright date: March 30, 2006
- ISBN: 0807508675

My personal favorite is the urban legend about the runner from England that decided to run 26.2 ...

Share the Wealth!

*South Dakota Teachers have so much to offer one another!
Please share an activity that "works" for you
with SDCTM members!*

Email submissions to: smcquade2@sfcss.org



Graphing Linear Inequalities with the TI 83/84

I would like to share the following inequality activity with the members of SDCTM. The first two examples demonstrate how to enter and graph linear inequalities in one variable into a TI-83/TI84 graphing calculator. Actually, I would want the students of an Algebra II class to be able to solve the first two inequalities without a calculator. The third example is the type that I would allow the students solve using a TI-83 or TI-84 graphing calculator.

Example 1:

Graph $x < -2$ or $x \geq 3$

Press $\boxed{Y=}$ X,T,θ,n $\boxed{2^{ND}}$ \boxed{MATH} $\boxed{5}$ $\boxed{}$ $\boxed{2}$ $\boxed{2^{ND}}$ \boxed{MATH} \rightarrow $\boxed{2}$ X,T,θ,n $\boxed{2^{ND}}$

\boxed{MATH} $\boxed{4}$ $\boxed{3}$

The graph should appear as shown below in figure 1. If the graph appears as shown in figure 2, then press \boxed{MODE} and select \boxed{DOT} to eliminate the “tails”.

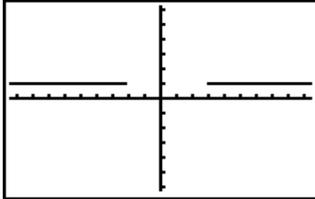


Figure 1

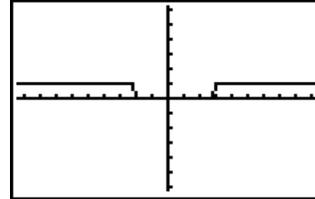


Figure 2

Example 2:

Graph $-3 \leq x < 4$

Enter $-3 \leq x$ and $x < 4$

Press $Y=$ $\boxed{}$ $\boxed{3}$ $\boxed{2^{ND}}$ \boxed{MATH} $\boxed{6}$ X,T,θ,n $\boxed{2^{ND}}$ \boxed{MATH} \rightarrow $\boxed{1}$ X,T,θ,n

$\boxed{2^{ND}}$ \boxed{MATH} $\boxed{5}$ $\boxed{4}$ \boxed{GRAPH}

The graph should appear as shown in figure 3. If the graph appears as shown in figure 4, press \boxed{MODE} and select \boxed{DOT} to eliminate the “tails”.

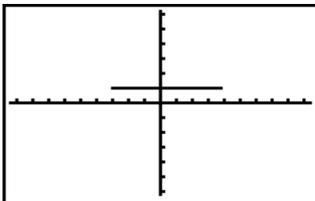


Figure 3

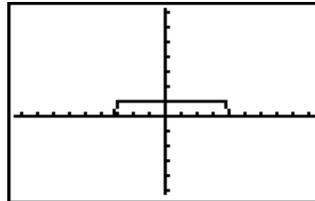


Figure 4



Example 3:

Graph $1 \leq |2x - 3| < 3$ (The absolute value function is found in the CATALOG menu.)

Note the following Y= menu in figure 5 and the corresponding graph of the inequality in figure 6.

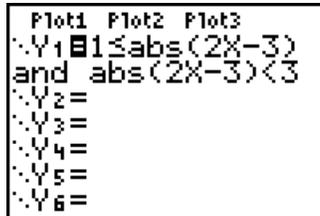


Figure 5

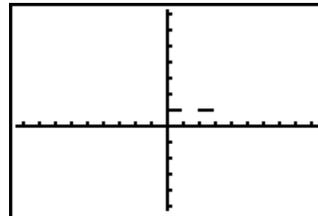


Figure 6

Use the TRACE function or ZOOM function to determine the endpoints of the intervals as shown below.

$$0 < x \leq 1 \text{ or } 2 \leq x < 3$$

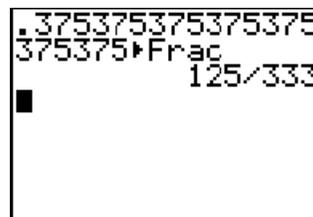
When I teach inequalities, I want the students to be able to solve and graph compound inequalities without the aid of the calculator. Once the students can solve simple compound inequalities, I like to give them more difficult inequalities and have them to enter these inequalities into their calculators and have them determine and correctly write the solution intervals. They may have to use the ZOOM and/or TRACE feature to find the exact value of the endpoints of the intervals. If irrational numbers are not given in the problems, then the endpoints of intervals should be expressed using rational numbers. Repeating decimals are usually easily converted to fractions with the TI graphing calculators. Note the following example.

Example 4:

Express $\overline{.375}$ as a fraction in the form $\frac{p}{q}$ where p and q are relatively prime. Make the following entry in the home screen as shown to the left below.



Press **MATH** **1**
ENTER
 To obtain the
 Screen on the right.



Therefore $\overline{.375} = \frac{125}{333}$



Print a copy of this form. Mail with check payable to SDCTM to:

Diana McCann
41876 Apple Tree Road
Springfield, SD 57062

Name _____

School Name _____

Subjects or Grades Taught _____

Addresses

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School _____

Mailing Address: _____ Home _____ School

Home Phone _____

School Phone _____

Fax Number _____

E-mail _____

Membership categories (Check only one)

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- _____ High School \$20.00
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- _____ Retired \$5.00
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SDCTM Newsletter
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www.sdctm.org

2006-2008

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