



Mathesis

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February 2016

President's Message

Mark your calendars - SAVE the Dates

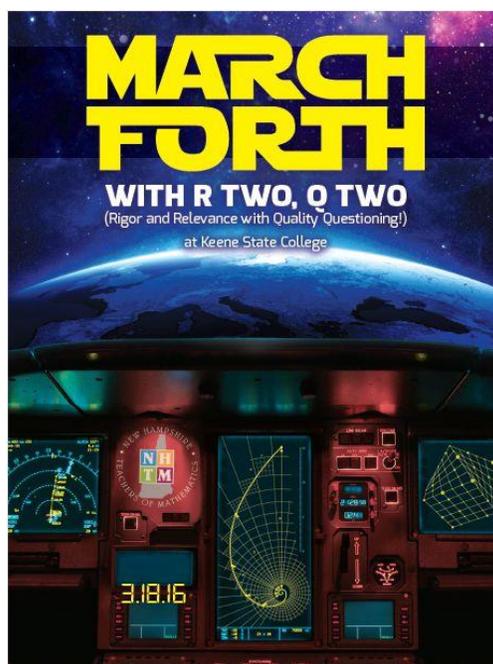
By Cecile Carlton

March 15, 2016

High school mathematics math team coaches should have received information about this year's New Hampshire State Mathematics Contest to be held on March 15, 2016 (Snow date March 16th) at Plymouth State University. Registration and payment is due on February 19, 2016. If you have not received information please e-mail Steve Latvis at slatvis@windhamsd.org

March 18, 2016

Join us for our annual spring conference to gather ideas, information and classroom resources.



Upcoming Deadlines:

- NHTM/PSU NH State Mathematics Competition Registration Deadline- February 19th
- NHTM/PSU NH State Mathematics Competition- March 15th
- ATMNE 2016 Conference Proposal Deadline- February 8th
- NCTM Annual Conference Early Bird Registration Deadline- March 4th

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President's Message:
**Mark your calendars -
 SAVE the Dates**

(CONTINUED FROM PAGE 1)

By Cecile Carlton

Dr. Eric Feldborg, the former Director of STEM Education at the New Hampshire Department of Education will give the Keynote address. An exciting day is being planned. My thanks goes out to those working behind the scenes to make this conference come together. This includes Dr. Beverly Ferrucci, Lauren Provost, Betty Erickson, Christina Anderson, Annie Wallace and Bernadette Kuhn.

Registration information will be on the web site and click [here](#) for the registration form if you prefer to send in a check.

Have you checked your membership status recently? You can check it on-line (www.nhmathteachers.org). If you recently changed your e-mail address please update your profile. Our NHTM communications are based on your contact information.

February 15 to March 18, 2016 will be our open period for voting. This year's Board positions include Secretary and Post-Secondary Representative. Biographical information is available in this issue of Mathesis and on the www.nhmathteachers.org website. Our Web Site Editor, Matt Tremer will be sending out information for voting. Watch for the e-mail and exercise your vote.

The recent edition of the New England Mathematics Journal is now posted on the

ATMNE web site. It will be located in the menu under 'Publications' and then 'NEMJ Electronic Version'. As a member of NHTM you are also a member of ATMNE. The New England Mathematics Journal (**NEMJ**) is published twice a year. The newest publication has gone digital. You need to have a current membership and profile information needs to be up-to-date. Our Web Site Editor will be sending you log in information (username and passwords) to be able to access the most recent and first digital publication. Watch for that e-mail. Our own Christina Anderson has an article "Turning Principles Into Actions: Making Mathematics Accessible to All".

April 13-16, 2016



Book Studies - On-Going Now

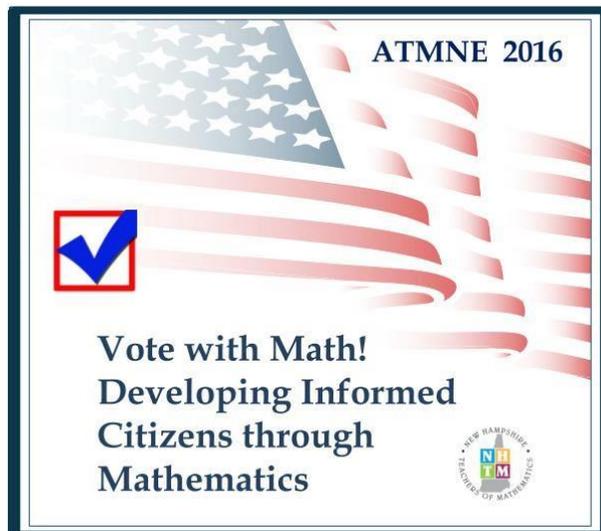
Regional Coordinators have started their book studies. Thanks to a grant from ATMNE each region identified a book of interest, books are available and meetings and reading are underway. If you were not contacted and are interested in learning more – click on <http://www.nhmathteachers.org/NHTM-Regional-Structure> and connect with your regional coordinator.

President's Message:
Keeping Members Up-to-Date on NHTM Happenings!

(CONTINUED FROM PAGE 2)

Looking Ahead – ATMNE 2016

We welcome you to join us to **Vote with Math! Developing Informed Citizens through Mathematics!** on **October 20-21, 2016** at the Radisson Hotel in Manchester, New Hampshire. You may also have time to submit a proposal to present in the fall. Submit your speaker proposal form [here](#) by February 8, 2016 to be considered for the program. If your proposal is accepted you get free registration to the conference. If you haven't been to an ATMNE conference do put it on your calendar and plan to bring a colleague.



NHTM Board members work throughout the school year to assist in having NHTM operate smoothly may I take this time to say "Thank You". It is a pleasure to lead this team!

Art's Attic
John Wallis

By Art Johnson

Every once in a while mathematics history pops up in an unexpected place. That is what happened recently to a particle physicist at the University of Rochester. Carl Hagan was explaining to his students how to use quantum mechanics to determine the approximate energy states of the hydrogen atom. As the data from the calculations were recorded, Hagan recognized something. "It was the [John] Wallis formula for Pi. It just fell into our laps."



Who was John Wallis and what is his Pi formula?

John Wallis was the second most prominent mathematician in Seventeenth Century England. (That is no mean feat, because number one was Sir Isaac Newton.)

Art's Attic **John Wallis**

(CONTINUED FROM PAGE 3)

Wallis was born to a local cleric and received good education, culminating in receiving a BA degree from Cambridge in 1637 and a Master's Degree in 1640.

Shortly after he graduated the Civil War between the Royalists and Parliamentarians broke out. Wallis favored the Parliamentarians and was a valuable supporter because of his ability to decode Royalist messages. At the war's end he was rewarded with positions as a clergyman at a succession of churches. During this time he began to associate with other men of learning to discuss [in Wallis's words] "...philosophical inquiries related topics such as medicine, astronomy, geometry, anatomy, navigation, statics, mechanics, and natural experiments." This informal group eventually became the Royal Society, with Wallis as a charter member.

These meetings awakened in Wallis an affinity for mathematics, which he pursued for the rest of his life. Oliver Cromwell himself appointed Wallis to the Davidian Chair of Geometry at Oxford in 1649, this despite his signing a petition to spare the life of King Charles I in 1648. This petition served him well in 1660 when Charles II came to the throne. Charles II re-appointed Wallis to his position in Oxford in recognition of that petition.

For the rest of his life Wallis explored mathematics, and is credited with early discoveries that prefigured the calculus Newton invented. Although second to Newton (and who wouldn't be second to him?), Wallis is known for several mathematics accomplishments.

He is credited with inventing the number line for integers, with negatives to the left and positives to the right. He also invented the familiar infinity sign (∞).

And that Pi formula? Here it is:

$$\pi^2 = 2/1 \times 2/3 \times 4/3 \times 4/5 \times 6/5 \times 6/7 \times 8/7 \times 8/9 \dots$$

(If you are wondering exactly how quantum mechanics uses the Pi formula, ask a science teacher in your school.)

Stay Informed!



- NHTM New Hampshire
Teachers of Mathematics



- @NHTM1964

Biographical Information about the Candidates: 2016 NHTM Election Approaching!

Biographical information on the candidates running for the Secretary and Post-Secondary Representative positions are given below. Voting ballots will again be cast online via the Internet. NHTM Ballot and Election information will be emailed to current NHTM members on February 15, 2016. Voting shall close at **12 Noon on March 18, 2016**, the day of the NHTM Spring Conference at Keene State College <http://tinyurl.com/hgg3yp7>. Results will be announced at the business meeting at the end of this event.

Remember you can now log into your NHTM account to check that NHTM has your preferred email address and check your membership status. **Your vote is important!** If for some reason you do not receive an email with a link to the online voting ballot and know that your membership is current, please contact Matt Tremer at webmaster@nhmathteachers.org directly after the last week of February 2016. We wish to give a big thank you to the following candidates for their willingness to serve you by running in this year's election.

Candidates for Secretary:

Bernadette Kuhn

Graduated from RI College with a Bachelor's in Elementary Education/Mathematics.

Has been teaching Mathematics in NH for 37 years

- 25 years teaching middle school mathematics
- 12 years teaching high school mathematics
- 3 years teaching some college level courses through River Valley Community College

Has a Master's Degree from Antioch University NE in Curriculum and Instruction. Is a member of NHTM and NCTM. Currently is in her 31st year of teaching at Monadnock Regional High School.

Natalie (Archey) LaFlamme

Natalie LaFlamme currently teaches Mathematics at Fairgrounds Middle School in Nashua, NH. Previously, she taught at Mountain View Middle School in Goffstown, NH for 20 years. Over the years, she has served on the NHTM board as the Middle Level Representative and as the NCTM Representative. She has also been on the Board of Directors for the New Hampshire Association of Middle Level Educators. Natalie has presented at numerous NHTM and NELMS (New England League of Middle Schools) conferences. She is consistently involved in curriculum development and promoting the implementation of best practices. Natalie received her Bachelors of Arts in Mathematics from Smith College and her Masters of Education in Curriculum and Instruction from Plymouth State College. Recently, she received an additional NH certification in ELL. Natalie loves teaching math at the middle level where the students make her laugh every day! She also loves being involved in making mathematics education at the middle level relevant and exciting for students.

Biographical Information about the Candidates: 2016 NHTM Election Approaching!

(CONTINUED FROM PAGE 5)

Candidates for Post- Secondary Representative:

Sharon McCrone

Sharon is a Professor of mathematics education and mathematics at the University of New Hampshire in Durham. She has been a member of the faculty at UNH for the last 8 years and before that was a member of the faculty at Illinois State University for 10 years. Sharon works with mathematics preservice teachers for grades K-12 in both mathematics content and methods courses. She stresses investigations, conceptual understanding and reasoning in all of her courses and conducts educational research of student learning in these areas. She also works with doctoral students to guide their dissertation work in mathematics education. Sharon was the lead author of NCTM's Focus in High School Mathematics: Reasoning and Sense Making in Geometry, and she freely admits that geometry is her passion. Sharon has been a member of the NCTM for 20+ years, and has presented at more than 15 state, regional, and national NCTM conferences. Sharon has served (and continues to serve) NCTM in various capacities such as referee for all of its journals; contributing author for Navigating Through Reasoning and Proof in Grades 9-12 and for Mathematics Education in the United States – A Capsule Summary Fact Book for ICME Conferences 2008, 2012,

and 2016; and reviewer of various other publications. She is looking forward to serving the NH affiliate (NHTM) as the Post-secondary representative.

Joseph W. Spadano

Joseph Spadano currently has a dual appointment as Associate Professor at Rivier University serving the Division of Education and the Department of Mathematics. Previously, Dr. Spadano taught all levels of mathematics during his 35 year career at Westford Academy. Joe earned his Doctorate in Mathematics Education at the University of Massachusetts Lowell. He was the 2001 recipient of the Presidential Award for Excellence in Teaching Mathematics, the 2002 recipient of the University of Massachusetts Lowell's Distinguished Alumni Award, and has achieved National Board Teaching Certification. Dr. Spadano has published and presented on many topics in mathematics and mathematics education. His most recent speaking experiences include presenting "Embedding Assessment into Instruction: Advancing Mathematics Learning and Teaching" at the October, 2015 NCTM Regional Conference & Exposition in Atlantic City, as well as, serving as Keynote Speaker addressing the topic "Advancing Mathematical Power through Problem Solving" at the June, 2015 Mathematics Learning Communities event hosted by New Hampshire Technical Institute. Joe is a long-time member of the National Council of Teachers of Mathematics (NCTM) and the Council of Presidential Awardees in Mathematics (CPAM). Dr. Spadano embodies excellence in teaching, is devoted to the learning needs of all students, and upholds the high standards that exemplify American education at its finest.

Elementary Representative **Competency Development**

By Amy Gregoire

Competency based education has been at the forefront of education for several years now. According to Ed 306.02 (d) “Competencies” means student learning targets that represent key content-specific concepts, skills, and knowledge applied within or across content domains. Specific and required types of competencies include district competencies and graduation competencies.

In 2013 the department of education invited educators to participate in the process of creating statewide college and career ready competencies. These state board approved competencies can be found on the NH department of education’s webpage at http://education.nh.gov/innovations/hs_redesign/competencies.htm. These provided a model for districts to begin their work in developing competencies. District competencies are benchmarks that guide the school’s determination that students are demonstrating proficiency of learning and preparing for college and career readiness. They inform the progression of curriculum K-12 and result in a continuum of learning expectations leading up to graduation. Graduation competencies are those needed for a student to be college and career ready, which includes core academic course competencies and associated knowledge, skills, and work-study practices. Both district competencies and graduation competencies are locally determined competencies, although a district may decide to include or adopt the statewide competencies.

This year my district has been assigned the task of creating grade level competencies. While our high school competencies have already been developed, it is now time for grades K-8 to write their competencies. This has been quite the challenging task. When researching competencies most of what is out there right now are graduation competencies, which is not very helpful when writing competencies for first grade students. We are fortunate that we have a curriculum coordinator who has been a helpful resource. I thought I would share what we have learned in this process to help those who may be in the midst or about to undertake this endeavor.

Competency statements have three parts. One part states the academic content to be assessed, based on standards and practices. Another part states the complexity of thinking that needs to be demonstrated, which would be considered a level of DOK (Depth of Knowledge). Finally, the third part must identify the conditions and resources under which the assessment will take place.

For the standards and practices we have used the Common Core Standards. The tricky part we found with this was writing competencies that were broad enough, so we would have no more than 8 to 10 competencies. We decided to organize ours by domains.

Elementary Representative **Competency Development**

(CONTINUED FROM PAGE 7)

Some domains may have only one competency, while others may have three. Once we determined the content we then decided what we wanted students to do with this content. We used a DOK wheel to help us with the verbs. The DOK wheel can be found at the following website: http://static.pdesas.org/content/documents/M1-Slide_19_DOK_Wheel_Slide.pdf. Finally we determined under what conditions we wanted students to perform, for example, given a real world problem. We are by no means done and are still in the trenches at this point. Once we do finish our competencies, our next task will be to create a performance assessment for each competency along with rubrics to assess each task. We are realizing that this is definitely going to be a dynamic document and will be ever changing.

Some exciting news is that the NH Department of Education has once again gathered a group of educators together who are going to be working on developing competencies for grades K-8. These competencies will be grouped in a manner such as K-2, 3-5, 6-8. Once these are developed it will provide another resource for elementary teachers who are writing competencies. I would love to hear from others who are working on this process as well. Feel free to contact me at agregoire@bownet.org.

Middle Level Representative

By Laura Culp

Last week I introduced a problem from rich.mathematics.org to my students. The problem:

Lisa's bucket does not have a hole in it and weighs 21 kg when full of water. After she pours out half the water from the bucket it weighs 12 kg. What is the weight of the empty bucket?¹

The problem was met by stillness, activity, and skepticism. The skepticism is what has continued to nudge my thought processes. Many of my students have continued to bring this problem up to me. What you, may ask, could the skeptics have been troubled by? A bucket

without a hole in it is not a bucket.

Those of you who may be reading this article and don't deal with middle schoolers on a regular basis may not know this, but middle schoolers are the best lawyers there are. Given the correct circumstances, they can create a strong viable argument faster than you can finish a sentence. So, back to the bucket...

The argument went as follows, if a bucket doesn't have a hole, how can the water be poured out? I attempted to explain that the definition of a bucket was a container without a lid, not a hole. There was no reasoning. I went home and after talking to my husband about the day's events he suggested that what they were describing was a barrel. I took that back to the class. No, a barrel also has a hole otherwise it wouldn't hold anything.

Middle Level Representative

(CONTINUED FROM PAGE 8)

I gave up at that point. They had solved the “math” problem and I had bigger fish to fry. Then this week I gave another problem and started to hear similar skeptical questioning.

Jerry forgot to plug in his laptop before he went to bed. He wants to take the laptop to his friend's house with a full battery. The pictures below show screenshots of the battery charge indicator after he plugs in the computer at 9:11 a.m.²

Here were the comments I heard:

Student 1: How do we know that this was all on the same [Saturday](#)?

Student 2: Why would he charge his battery on different Saturdays?

Student 1: It doesn't say it is the same [Saturday](#). Maybe the charging is REALLY slow.

Student 2: Why would he charge his battery on different Saturdays?

Student 1: Why would he take screenshots of his charging battery?

I've been adding problems to my class. I've been attempting to get my students discussing math in ways I want them to discuss it. However, what I've found is that students see things differently than I do. There is not a filter of experience in their minds. Sometimes this is bad and sometimes this is good.

These students are not attempting to bail on the thought process. Rather, they are picking up the problem in their mind and turning it around - looking at it from different angles. It is really easy as their math teacher to throw up my hands, say “You know what I mean,” and move along to the next thing.

I'm striving to cherish this discourse, to use it to push the argument making in a new direction. Convince me that a bucket has a hole. Explain to me how she could pour water out of such a vessel. Draw a bucket and label the parts.

It isn't easy and it isn't always fun. It is what we are asked to do as teachers, though, particularly of the amazing breed called middle schoolers.

By the way, here's a definition of the word hole: A hollowed place in something solid; a cavity or pit.³ Middle schoolers are the best lawyers around!

¹"Bucket of Water : nrich.maths.org." 2009. 17 Jan. 2016 <<http://nrich.maths.org/4730>>

²"8.SP Laptop Battery Charge - Illustrative Mathematics." 2015. 17 Jan. 2016

<<https://www.illustrativemathematics.org/content-standards/tasks/1558>>

³"Hole - definition of hole by The Free Dictionary." 2004. 18 Jan. 2016

<<http://www.thefreedictionary.com/hole>>

Secondary Representative **Activity- Toy Factory Project**

By Michelle Fox

I love having "real life applications" for any of the topics that I teach in Algebra. I use this activity every year in one way or another, as a worksheet to preview linear programming, as a review of linear inequality systems before final exams, as a quiz, etc. I like this activity because it speaks to at least three mathematical practices: Model with Mathematics, Attend to Precision, and Make Sense of Problems and Persevere in Solving Them.

Toy Factory Project

Otto Toyom owns a company that manufactures toy cars and trucks. Each car can be manufactured using one gas tank, four wheels, and two seats. Each truck can be manufactured using three gas tanks, six wheels, and one seat. In his stockroom, Otto only has 15 gas tanks, 14 seats, and 36 wheels available to his workers to use in the construction in these toy cars and trucks.

1. Would it be possible to make **five** trucks and **one** car from the supplies that Otto has available to him? Explain why or why not, and show any work that you did to get the answer.
2. Write three different inequalities to represent the relationship between the **number of cars, x** , the **number of trucks, y** and the number of available:
 - a. Wheels _____
 - b. Seats _____
 - c. Gas tanks _____
3. Graph the system of inequalities from #3 on a piece of graph paper.

4. What are the vertices that outline the solution set (the corner points and intersection points of the constraints that outline the solution set)? These points represent the maximum number of cars and trucks that Otto can make, based on the restrictions of tires, wheels, and gas tanks given above.

There should be five vertices...

Vertices : _____

5. Otto makes \$5 on each car and \$5 on each truck he manufactures. Write a profit equation that describes this profit for Otto.

Profit Equation: $P =$ _____

6. What combination (or combinations) of cars and trucks (taken from #5) will give Otto the greatest profit? What is this profit?

7. **Combination:** _____ cars _____ trucks

Profit: \$ _____

8. Now, pretend that during the course of the building of these toys, Otto's profit changed to \$15 per truck but stayed at \$5 per car. Write a new profit equation that describes Otto's new profit. What new combination of cars and trucks (using the vertices you found on #5 from above) would give Otto his maximum profit? What is this profit?

New Profit Equation: $P =$ _____

Combination: _____ cars _____ trucks

Profit: \$ _____



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

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Today!



INSPIRING TEACHERS. ENGAGING STUDENTS. BUILDING THE FUTURE.

NHTM Mathematics Major and Mathematics Education Scholarships: High School and College Students

By Rich Andrusiak, Post-Secondary Representative

The New Hampshire Teachers of Mathematics provides a \$1000 scholarship for a graduating high school senior and a \$1000 scholarship for a college student who will obtain junior or senior status in the 2016-2017 academic year.

The high school scholarship will be awarded to a graduating senior who will be attending an accredited college or university in the fall and plans to major in mathematics or mathematics education with the intent of becoming a mathematics educator. The selection team will consider academic achievement, financial need, extra-curricular activities, and community and school service.

The college scholarship will be awarded to a student preparing for certification to teach middle school or secondary mathematics, or elementary education. Eligible candidates will be enrolled in a middle or secondary mathematics certification program or elementary education certification program. Preference will be given to students attending a New Hampshire institution of higher education. The selection team will consider academic achievement, financial need, and will look for evidence of promise of a teacher of mathematics.

In January, I e-mailed information about these scholarships to high schools and institutes of higher education across NH. Additional information, along with the on-line application, can be found at <http://www.nhmathteachers.org/> by following the resources drop-down menu. The application deadline is May 1, 2016.

If you have any questions, please contact me at randrusiak@ccsnh.edu.

NCTM Representative

San Francisco, Books, and Advocacy

By Terri Magnus

Have you registered for the 2016 National Council of Teachers of Mathematics Annual Meeting and Exposition? With the theme of "Building a Bridge to Student Success," the conference offers participants the option of choosing from hundreds of sessions and workshops on a wide variety of topics, covering every grade level. Every NCTM Meeting comes alive with the enthusiasm, expertise, and synergy of nearly 10,000 mathematics educators from across the country gathered together for a few days, listening to nationally recognized speakers and attending smaller workshops. The conference runs April 13-16, 2016 in San Francisco and is preceded by preconference workshops and the NCSM (Math Ed Leadership) Conference. Visit www.nctm.org/sanfrancisco for more information and to register. If you need help approaching your supervisors regarding funding or time off, click on the "get support" link to find a sample letter and additional information to help you frame and support your proposal.

NCTM Representative **San Francisco, Books, and Advocacy**

(CONTINUED FROM PAGE 13)

NCTM also offers an extensive collection of resources for mathematics educators. Be sure to stop by the NCTM booth in the Exhibits at our March 18 NHTM Conference in Keene to check them out. Some of the currently featured titles include: **Mastering Basic Math Skills: Games for Third through Fifth Grade** by Bonnie Adama Britt, **Putting Essential Understanding into Practice: Statistics, 9-12** by Terry Crites and Roy St. Laurent, **Mathematics Lessons Learned from Across the World 7-12**, edited by Johnny and Carolyn Lott, and **5 Practices for Orchestrating Productive Mathematics Discussions** by Mary Kay Stein and Margaret Schwan Smith.

NCTM continues to advocate for high quality mathematics education by meeting with Congress, participating in Capitol Hill briefings, and testifying at hearings related to the No Child Left Behind Act and other issues of importance to mathematics education. December 10, 2015, President Obama signed the Every Student Succeeds Act (ESSA) into Law ending the era of Adequate Yearly Progress and Highly Qualified Teacher requirements and enabling states the freedom to develop and implement their own standards, assessments, and accountability measures. States will continue to assess student achievement in mathematics (and now science) annually in grades 3 through 8 and once in high school. While the new act does not meet all of NCTM's recommendations, it does "incorporate some improvements" and demonstrates that "hard-fought compromises are sometimes required to move forward with legislation that everyone can accept." The [December 10, 2015 NCTM News Release](#) also identifies how the ESSA shifts funding of certain educational programs and that NCTM will continue to advocate for money targeted to mathematics professional development.



Interested in following the NHmathed List Serve?

To subscribe go to <http://listserv.plymouth.edu/mailman/listinfo/nhmathed>

From the Desk of the Membership Chair

By Gretchen Scruton

Thank you for your online membership renewals! Currently our membership total is 222.

As of January 14, 2016—

# of NHTM Memberships	Memberships Current Through Year
185	2016
26	2017
2	2018
1	2019
8	Honorary Lifetime

You may log in at any time at www.nhmathteachers.org to verify that your personal information is up to date or check your membership status. If you have any questions please don't hesitate to send an email to membership@nhmathteachers.org.

At our NHTM Spring Conference on Friday, March 18, 2016, to be held in Keene, NH we plan to honor our members who have been in the organization for 25 years. Do plan on attending the Conference this year and if you fall into this veteran category – please e-mail membership@nhmathteachers.org to ensure that you will be recognized!

How many of the single digits 1 through 9 are factors of 2016?



Ready for the solution? [Click here.](#)

To: High School Mathematics Team Advisors
From: NHTM and the PSU Mathematics Department

Re: **44**th Annual NH State High School Mathematics Contest

NHTM (New Hampshire Teachers of Mathematics), and the Plymouth State University Mathematics Department invite you to form one 10 member mathematics team with no more than four seniors and a maximum of eight juniors and seniors and to join us for our 44th annual competition this year on **Tuesday, March 15, 2016 at Plymouth State University** (with a snow date of Wednesday, March 16 - still at Plymouth State University). Your team will have the opportunity to meet with other students from throughout the state in a day of exciting, challenging, competitive mathematics exercises in six different categories.

The **Team category** involves all 10 members of the team separated into two groups of five. One of the four team category questions will require each group of five students working together to submit an expanded, detailed written response. That particular response will be judged on the style of solution, the coherence of the explanation and the organization of the correct solution. In other words, teams will need to present more than the correct answer to receive maximum credit for this question! A special group of judges will be responsible for scoring these papers. Each registered school will be assigned a code to be used for this category.

The remaining categories in the contest are **Recreational Mathematics, Algebra 1, Geometry, Algebra 2,** and **Advanced Mathematics**. Each of these 12-minute categories will consist of three questions of equal value taken by six members from each team. In these categories students work independently.

Any non-laptop type calculator allowed in the mathematics sections of the SATs and the College Board AP exams may be used in the contest. It is assumed that every participant will have a graphing calculator available to use in the contest. Please use the following link for reference: <http://sat.collegeboard.org/register/calculator-policy>

There will be four divisions of competition. See the registration page for division requirements. Use October 1st, 2015 as the official date for school enrollment figures. Please check this figure with school officials to avoid problems of being registered in an incorrect division. **ALSO PLEASE NOTE – the division enrollment figures have changed for 2015 based on NHIAA divisions, so please check carefully!**

The contest is scheduled to begin at 9:40 am and the awards ceremony at 1:00 pm.
Don't delay! Register today for our 44th annual contest!

Registration deadline: Friday, February 19, 2016

NEW IN 2016 – You may also fill out the registration form, scan it, and e-mail your registration! E-mail your registration as an attachment to:
slatvis@windhamsd.org

ATMNE 2016



Vote with Math!

**Developing Informed
Citizens through
Mathematics**

Conference Co-Chairs:

Laurie Boswell
laboswell@gmail.com

Cecile Carlton
Cecile.carlton@comcast.net

Program Co-Chairs:

John Donovan
jdonovan@holderness.org

Kim Knighton
kknig@profile.k12.nh.us



October 20-21, 2016

[Radisson Hotel](#)

Manchester, NH



November 2015

Dear Mathematics Educator or Enthusiast,

NHTM is excited to host the next ATMNE Fall Conference:
**"Vote with Math! Developing Informed Citizens Through
Mathematics."**

The conference will be held on October 20 & 21, 2016, at the
[Radisson Hotel](#) in Manchester, NH.

Join NCTM President-elect [Matthew Larson](#), [Margaret "Peg" Smith](#), and [Tom Reardon](#) in Manchester, NH at the ATMNE 2016 Fall Conference. [Submit your speaker proposal by February 8, 2016 to be considered for the program.](#)

We hope that you will submit a proposal. As teachers, we learn best when we learn from each other. Please plan on joining us in promoting the importance of mathematics in making daily decisions as well as electing a new president!

If you have questions about the proposal form, feel free to contact [John Donovan](#). If you have questions about the conference, feel free to contact [Cecile Carlton](#).

Thank you for your contributions toward making this a great conference.

The ATMNE 2016 Program Committee,

John Donovan
Holderness School

Kim Knighton
Profile School

Professional Development Resources

Are you looking for good professional development resources?

Consider the *New England Mathematics Journal*!



**Moving Principles into Actions: Understanding the Challenges
and Promise of Principles to Action – May 2015**

**Classroom Assessment to Achieve the Common Core Standards for
Mathematical Practice – May 2014**

Mathematics Coaching – Implications for Change- May 2013

**Envisioning Effective Implementation of the
Common Core Standards for Mathematics - May 2012**

Exploring the Richness of Geometry via Technology – May 2011

And Many More Issues at: <http://www.atmne.net/>

**For more information or to purchase issues contact:
atmne@keene.edu**

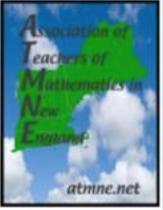
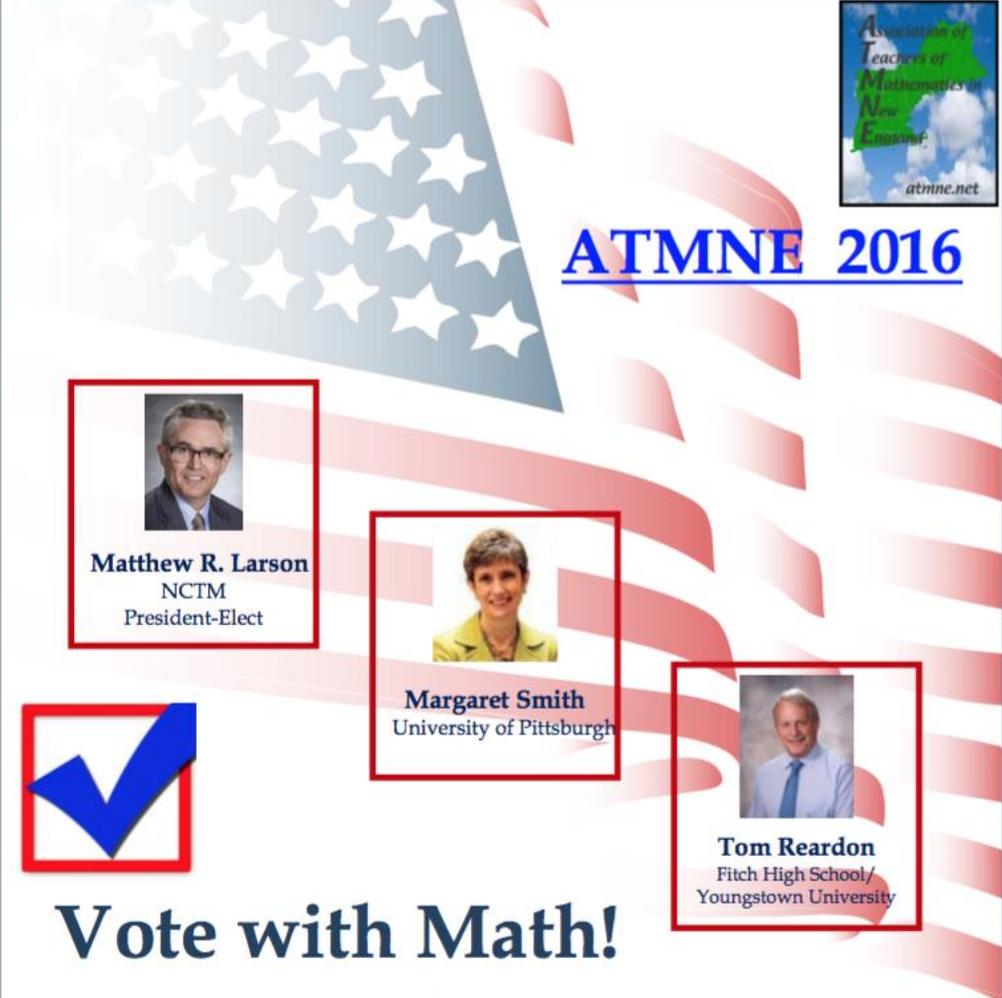
Do you know an exemplary math or science teacher? Nominate them for the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) today!

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) program is pleased to announce that nominations and applications for the 2015-2016 award year are open. Assistance in nominating PAEMST candidates is an integral component to a successful candidate pool. With your help, we hope to secure an even higher number of submitted applications for the 2015-16 awards cycle than we have received in previous years. To submit a nomination for an exceptional K-6th grade teacher, complete the nomination form available on the PAEMST website, and submit the teacher's name, email address and school contact information. You are welcome to submit multiple nominations if you know more than one teacher deserving of this award. The 2015-2016 nomination deadline is April 1, 2016, and the application deadline is May 1, 2016. Teachers may also apply directly at www.paemst.org. There are also several resources available to you

at <https://www.paemst.org/recruitment.TwitterPresidential>

PAEMST will honor outstanding K-6 grade teachers. Don't miss out on this wonderful opportunity to honor our nation's greatest educators! Should you have any questions about the program or the nomination process, please contact info@paemst.org or 855-723-6780. The contacts for the NH DOE are Donna Dubey – donna.dubey@doe.nh.gov for math questions and Erick Feldborg – eric.feldborg@doe.nh.gov for science questions.





ATMNE 2016



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The First New³ Math Conference

Coming Together for Learning, Teaching and Students

A Joint Conference of the Associations of Mathematics Teachers
Of

New York - AMTNY

New Jersey - AMTNJ

New England - ATMNE



Hosted By



June 27 – 29, 2016 at Iona College (near NYC)

Conference Program

- Exciting program drawing on outstanding mathematics educators from the northeast
- Narrow Grade Band Workshops for Pre-K – K, 1-2, 3-4, 5-6, 7-8, HS during each session time
- In-depth multi-part workshops

Featured Speakers

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- Jenny Tsankova
- Eric Milou
- Mary Behr Altieri
- Jim Rubillo

Some Major Speakers

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Kees DeGroot Ellen Falk
Karen Graham Deby Ives
Mary Calder Eric O'Brien
Nicole Panorkou Steve Yurek
Suzy Koontz Robyn Poulsen
Judy Curran Buck
and many more

Other Conference Features

- Affordable - approximately \$250 for commuters, \$500 for residents
- No sub plans needed
- STEM Camp for participants' children grades 1 through 8
- Community Atmosphere
- Extra-curricular Events including Broadway, Yankees or Circle Line Cruise

The New³ Math Associations will be posting more information about this conference on their websites and sending e-blasts. If you would like to be on a conference distribution list for the latest updates, please e-mail conference coordinator, Jim Matthews at matthews@siena.edu. Please use "New Cubed" in the subject line of your e-mail.

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<http://www.nhmathteachers.org/page-1715832>

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Professional Development & Conferences

National

T3 Annual Conference	Ft. Lauderdale, FL	February 10-12, 2016
ICTCM 28th Annual Conference	Atlanta, GA	March 10-13, 2016
2016 NCSM Annual Conference	Oakland-San Francisco Bay Area, CA	April 11-13, 2016
2016 NCTM Annual Meeting & Exposition	San Francisco, CA	April 13-16, 2016
MAA MathFest	Columbus, OH	August 3-6, 2016

Regional

The First New ³ Math Conference	New Rochelle, NY	June 27-29, 2016
ATMNE Fall Conference	Manchester, NH	October 20-21, 2016

State

44 th NHTM/PSU NH State Mathematics Competition	Plymouth, NH	March 15, 2016
NHTM Spring Conference	Keene, NH	March 18, 2016

Mathesis is the newsletter of the New Hampshire Teachers of Mathematics. It is published four times a year: August, November, February, and May. The mission of the New Hampshire Teachers of Mathematics shall be to provide vision and leadership in improving the teaching and learning of mathematics so that each student is ensured quality mathematics education and each teacher of mathematics is ensured the opportunity to grow professionally.

Solution to Problem from p. 15--

All but the digit 5. The number 2016 prime factors as $2^5 \cdot 3^2 \cdot 7$, and 1, 2, 3, 4, 6, 7, 8, and 9 are seen to be factors of it.