



*Winter 2024 • Volume XLVII Number 1*

## IN THIS ISSUE

Presidents Message, *p. 1*

AMTNJ High School and  
Middle School Math Contest,  
*p. 2*

Volunteer Call: AMTNJ Fall  
Conference, *p. 3*

AMTNJ Scholarship Program  
*Joan J. Vas, p. 3-4*

AMTNJ Spring Conference,  
*p. 5*

DESMOS Corner  
*Caitlin Murphy*  
*p. 6*

Monmouth Math Contest  
*p. 7*

AMTNJ Customized PD  
*p. 7*

AMTNJ Spring 2024  
Conference Featured Speakers  
*p. 8-9*

Stay in the "Know"  
*p. 9*

Math Shirt Monday  
*Andrea Bean, p. 10*

New Teachers Section,  
*p. 11*

Implementing Tier I  
Intervention in High School  
Math Class  
*Kara Teehan, p. 12*

Math Education Student  
Corner, *p. 13*

Puzzle Corner, *p. 13*

Scholarship Application, *p. 14*

## PRESIDENT'S MESSAGE

Dear Members,

It is with great enthusiasm that I step into the role of President of AMTNJ for 2024, and I am eager to contribute to the continued growth and success of the organization.

Firstly, I would like to express my sincere gratitude to John Kerrigan for his dedicated service and leadership during his tenure. I am committed to building upon the foundation laid by John, my other predecessors, and the 2023 Board of Trustees.

This includes building on our sold-out Fall 2023 conference which featured Peter Liljedahl as our keynote speaker. Our goal for both of our 2024 conferences is strike a balance between featuring distinguished speakers from broader horizons in mathematics education and providing a platform for the wealth of expertise within our local community. By combining insights from nationally-recognized figures in the field with the valuable perspectives of our local speakers, we seek to create a varied and rewarding learning experience for our members that fosters a well-rounded and inclusive professional development environment.

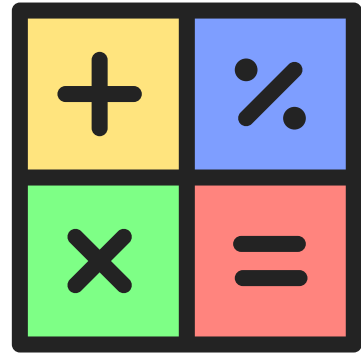
We are also happy to share the return of our one-day workshops. We kicked this off with a three-week Elementary Series addressing topics, including fractions, D.I.Y games, and inclusive math spaces. Finally, we have increased our social media presence. We continue to be active on [Twitter/X](#) and you can also now find us on Facebook, [LinkedIn](#), and [Instagram](#). We welcome you to engage with us and each other using the hashtag [#LearnwithAMTNJ](#).

We value the diverse perspectives and contributions that each of you bring to the organization. Whether you find fulfillment through attending our in-person events, connecting with fellow educators via social media, or by leveraging our publications for your professional growth, we invite you to participate to your fullest. Your unique insights and involvement are integral to the vibrancy and success of our community.

I look forward to connecting with each of you in the coming weeks and months. Your feedback, ideas, and support are essential as we work together to increase our access and appeal, foster a greater sense of community among mathematics educators, and expand the scope of our professional learning opportunities. If you have any suggestions, concerns, or if there are specific areas you would like us to focus on, please feel free to reach out to me at [president@amtnj.org](mailto:president@amtnj.org). Thank you for the trust and confidence you have placed in me. I cannot wait to work collaboratively with the 2024 Board of Trustees and entire membership to make a difference in mathematics classrooms across **all** of New Jersey.

Sincerely,  
Cheryl Fricchione

# AMTNJ High School Contest



The 2024 AMTNJ High school math contest took place on January 17th, 2024. Please check the website for registration for next year's high school math contest!



12TH ANNUAL AMTNJ  
MIDDLE SCHOOL  
MATH CONTEST

*February 15th, 2024*

[Registration Link](#)

Open to grades 6-8 for NJ public, private, and parochial

## **VOLUNTEER CALL: AMTNJ SPRING CONFERENCE**

- AMTNJ is hosting an in-person mathematics education event this fall on Friday, March 15th, 2024. The event, “Mathematics Beyond Numbers: Content, Concepts, and Community”, takes place at Rutgers University, Piscataway.
- The keynote is Deborah Peart, CEO of My Mathematical Mind.
- The event runs from 8 am to 3:30 pm.

We are looking for current math and math education college and graduate students to assist on the day of the event.

Please reach out to [info@amtnj.org](mailto:info@amtnj.org) if interested in volunteering!

## **CALL FOR AMTNJ SCHOLARSHIP APPLICATIONS**

**Joan J. Vas, Executive Coordinator, AMTNJ Scholarship Program**

**Please see the last page of the newsletter for the 2024 scholarship application!**

The AMTNJ Scholarship Program is designed to support the efforts of graduating high school seniors who wish to pursue a career in mathematics education, have a strong academic background and need financial assistance. The program, in fact, after 29 years, is flourishing. To date, 65 graduating seniors have received this scholarship. Many of them have applied for renewals for three years beyond the initial award.

Any active member of AMTNJ can nominate high school seniors for this scholarship as long as the student desires to become a math teacher, will be accepted/enrolled in a mathematics teacher education program in an accredited or approved 4 year college or university, has strong grades and needs financial aid. The current application is available on the AMTNJ website, [www.amtnj.org](http://www.amtnj.org).

# AMTNJ Scholarship, continued

You do not have to be the candidate's math teacher to nominate someone. You could be teaching at any grade level, be an administrator or retired. If you are an active member of AMTNJ, you can nominate a senior. I urge you to reach out to your colleagues, school counselors and administrators. If you are asked to nominate someone you do not know, meet with the student and try to determine if they might be eligible. The deadline for submitting applications is April 15, 2024.

AMTNJ has a strong history of committing to improving the field of mathematics educators and supports the development of young people in this important vocation. Please join us in the search for future NJ math educators.

The AMTNJ Scholarship Program is a 501-C3, tax deductible charitable program. Any donations can be mailed to: AMTNJ Scholarship Program, C/O Joan J. Vas, 10 Edgewater Drive, Matawan, NJ 07747. Thank you to ALL AMTNJ members for your donations and continued support of the program.

## Volunteers Needed!

AMTNJ is looking for a few volunteers to join our organization. We meet virtually a few times yearly and initiate various math events, programs, and publications. This is a great opportunity for teachers, consultants, admins, professors, retirees, etc. Email us at [info@amtnj.org](mailto:info@amtnj.org).



# AMTNJ "Mathematics Beyond Numbers: Content, Concepts, and Community"

AMTNJ is hosting an in-person mathematics education event this fall on Friday, March 15th, 2024. The event, "Mathematics Beyond Numbers: Content, Concepts, and Community", takes place at Rutgers University, Piscataway on the Livingston campus.

The keynote is Deborah Peart, CEO of My Mathematical Mind.

The event runs from 8 am to 3:30 pm.

Stay tuned to our website for more information on our spring conference. Registration is available!

Our spring event promises to be an exciting conference, featuring talks on relevant topics including equity, social justice, data science, algebra content, engagement, leadership, and more.

We welcome teachers, co-teachers, building and district leaders, and anyone else interested in the learning and teaching of mathematics content. We will have a number of vendors on hand, as well as door prizes and meals for attendees included as part of the day!

Please note: AMTNJ does not accept cancellations after one week prior to any conference.

Please submit your registration to your Board of Education as early as possible for Board approval.

Register: [Spring 2024 Conference Registration Form](#)



**AMTNJ**  
ASSOCIATION OF MATHEMATICS  
TEACHERS OF NEW JERSEY

**March 15, 2024**  
**Rutgers New Brunswick**



## KEYNOTE & FEATURED SPEAKERS



**Deborah Peart**

### **Mathers Gonna Math: The Rebranding of Mathematics**

"I am not a reading person" is not something we typically hear people say, yet it is pretty standard to hear, "I am NOT a math person!" Historically, education focused on literacy and mathematics was reserved for the elite class, and only the procedural parts were shared with "the commoner." Basic computation skills without deep thinking were all the laboring class would need. A singular, lackluster version of mathematics void of exploration and wonder is what the masses inherited. Unfortunately, this perception lingers, so we must re-brand mathematics by changing our language and shifting our beliefs about who is wired to do math. Historically marginalized students need to know they have beautiful mathematical minds and that they were meant to achieve greatness. By debunking myths of mathematics being a subject reserved for an elite group with "the math gene," teachers are encouraged to set high expectations for all students. It is time to celebrate that we are all Mathers!



# Piecewise, Lava and Desmos

Caitlin Murphy

I LOVE piecewise functions. They can be so funky, fun and our students can learn so much from exploring piecewise functions. One of my favorite ways to explore these functions is with an activity from the brilliant Andrew Stadel, [Lava and Piecewise Functions](#). The beauty of an activity like this is that it can be scaled up or down and can be used in classes from Pre-Algebra through Pre-Calculus.

The premise of the activity is that students have to get from point A to point B without touching the 'lava.' They have to use functions and their domains to move through the different slides with increasing challenges and obstacles. Depending on the grade or level of the students, you can work with just linear functions or work with other functions values like absolute value, quadratic or even a square root if you are feeling funky! I have used this activity in my Algebra 2 class for the past few years and students give a variety of responses. Typically, I do this activity after students have learned a few function families individually and then we start to play around with placing them on the graph and limiting their domains.

One thing that students need to know and understand is how to write a limited domain (or range!) for a function in Desmos. Restrictions on a function are written directly after a function, inside of  $\{ \}$  and using inequality notation. An example is shown below (this is slide #2 of the Lava Desmos).

Function order	Function and Domain restrictions
1st	$3\{-9 < x < 4\}$
2nd	$\frac{3}{2}x - 3\{4 < x < 8\}$

I modified this activity slightly ([link here](#)) for use in my Algebra 2 class for students to review some functions families and then work up to the way Desmos uses for writing functions and the domain restrictions. For more practice, [linked](#) is a worksheet I use to reinforce and practice piecewise functions. Happy graphing!!



*First Annual Monmouth University  
High School  
Mathematics Contest*

Monmouth University is hosting a **FREE** math contest in May, 2024 for high school juniors in pre-calculus. This is a great opportunity for students post-AP exam!

Please contact Kara Teehan at [kteeahan@monmouth.edu](mailto:kteeahan@monmouth.edu) for more information or to register!

Registration link can also be found here:

[MU Math Contest Registration](#)



## AMTNJ Customized PD



AMTNJ is proud to offer customized professional development (PD) services that are tailored to meet the unique needs of your school. Our team of experts is dedicated to helping your teachers achieve their goals and improve their instructional practices.

We have worked with several schools across the state, including Wood-Ridge, Holmdel, and Alexandria, and have provided PD on a variety of topics, including Best Practices for Teaching Math, Using Data for Middle School Teachers, Strategies for AP Teachers, and Differentiation. With experts available for every grade level, we can accommodate requests for both special education and general education teachers.

Whether you prefer in-person sessions or virtual Zoom sessions, we can provide the training your teachers need to enhance their teaching strategies and meet the needs of their students. If you are interested in targeted PD for your district, please reach out to us at [info@amtnj.org](mailto:info@amtnj.org) for pricing and more information. Let us help your teachers excel and improve student outcomes through our customized PD services.



# AMTNJ Spring 2024 Conference Featured Speakers



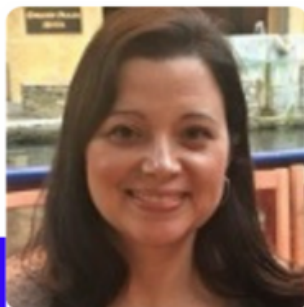
**Gail Burrill**

Data Science  
9-12



**Andrew Gael**

Creating Access  
6-8



**Gina Kling**

Fact Fluency  
K-5



**Ed Nolan**

Questioning  
6-8



**Shauna Hart**

TNTP's *The Opportunity Myth*  
9-12

Read more about our keynote and featured speakers and register now at:  
[www.amtnj.org](http://www.amtnj.org)

Join us on **March 15, 2024**  
at Rutgers New Brunswick

9-12  
Featured  
Speakers

## AMTNJ Spring Conference

**Mathematics Beyond Numbers:  
Content, Concepts, and Community**



**Gail Burrill**

Integrating Mathematics, Statistics, Data, and Data Science

Adding statistics, data and data science into an already packed high school mathematics curriculum can be difficult. One strategy is to connect standard mathematical content and statistics/data, creating a "data rich" curriculum. For example, work with mathematical expressions and formulas can also engage students in organizing and managing large data sets. Systems of equations can be motivated by comparing median incomes by gender. Statistical ideas such as z-scores can be used in modeling data involving variables with different magnitudes and units - ranking NFL quarterbacks or countries according to safety. Data driven activities can motivate students and help them understand why mathematics is useful in a world awash in data.



**Shauna Hart**

The Opportunity Myth and High-Quality Learning Acceleration for All Students

Participants are introduced to TNTP's research report, *The Opportunity Myth*, in which researchers followed nearly 4,000 students in five diverse school systems to learn what they experience in school every day—and how schools can create experiences that will help more students reach their goals. Participants will engage in an interactive experience, following a real student highlighted in the report through their experiences and access to each of the four resources: grade-appropriate assignments, strong instruction, strong engagement, and educators with high expectations. Participants will make connections between the report's findings, and learning acceleration and instructional coherence. They will learn what learning acceleration and instructional coherence look like in practice, and why their system must ensure that every component of students' academic experiences supports grade-level instruction and learning acceleration (rather than a remediation) approach to student learning. Participants will also have an opportunity to hear about TNTP's work supporting students' academic experiences locally through our partnership with Passaic Public Schools.

Read more about our featured speakers and register now at:

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

Join us on **March 15, 2024**  
at Rutgers New Brunswick

6-8  
Featured  
Speakers

## AMTNJ Spring Conference

**Mathematics Beyond Numbers:  
Content, Concepts, and Community**



**Ed Nolan**

Questioning to Privilege Student Thinking

How can questioning support and honor student thinking? Questioning should encourage students do the sense making. Explore planning questions, anticipating responses, and developing actions to engage students in learning. Tools are provided to create environments where students do the sense making.



**Andrew Gael**

Creating Access to Mathematics in YOUR Classroom

Accessibility is the first step in creating equitable environments for learning mathematics. This session will explore planning and instructional strategies for creating access to mathematics with appropriately high expectations and cognitive demands. Going beyond simple modifications will truly benefit every learner in your math class!

Read more about our featured speakers and register now at:

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



# AMTNJ Spring 2024 Conference Featured Speakers (continued)

Join us on [March 15, 2024](#)  
at Rutgers New Brunswick

K-5  
Featured  
Speakers

## AMTNJ Spring Conference

### Mathematics Beyond Numbers: Content, Concepts, and Community



**Gina Kling**

**A Meaningful Pathway to Basic Fact Fluency**

What does it really mean to be fluent with basic facts? In this session, we will unpack the meaning of fluency and examine a trajectory for how students master their facts. Come explore how we can use visual imagery, games, and formative assessment techniques to ensure all students develop lasting and meaningful fact mastery.



**Deborah Peart**

**Mathers Gonna Math: Building a Community of Mathers**

It is critical to build a math community where it is safe to take risks and share ideas. As with everything else, the teacher sets the tone and needs to anchor the room. This session will establish a basic understanding of how mindset can set the stage for peace and productivity in the classroom. In addition, we will examine how mindsets and beliefs directly impact students' ability to be successful in mathematics. Math class is often a place where it is believed that some belong more than others, so we as educators must nurture the development of positive math identities and create a sense of belonging for all. Many students are in classrooms with limited opportunities for discourse, sense-making, and mathematical discovery. Together, we will explore practical ways to increase engagement without creating chaos. With mathematics being the most anxiety-producing subject, it is time to extend the invitation to all students and teachers so they gain access to math joy.

Read more about our featured speakers and register now at:

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

## AMTNJ: Stay in the know

Spring 2024 One Day Conference - *March 15th, 2024 at  
Rutgers University (Livingston campus)*

Keep up with us on twitter @amtnj

# Math Shirt Monday

## Andrea Bean, AMTNJ Past President

The spirit of NJ math teachers is unparalleled, and it's time to let it shine! Embrace the excitement for mathematics and show off your pride by participating in Math Shirt Monday, a year-long celebration of our love for all things math.

Every Monday, we invite you to wear your most vibrant and quirky Math themed shirts to school. Whether it's equations, mathematical patterns, or punny math jokes – let your shirts speak volumes about your passion for the subject!

But the fun doesn't stop there! We encourage you to take a group picture with your fellow math enthusiasts and tweet it using the hashtag #mathshirtMonday. Share the joy and camaraderie with the world as we come together as a strong math community in New Jersey.

Tag us at AMTNJ (Association of Mathematics Teachers of New Jersey) to be a part of this exciting movement. By doing so, you not only inspire others to embrace the joy of math but also stand a chance to win fantastic prizes! 🎁

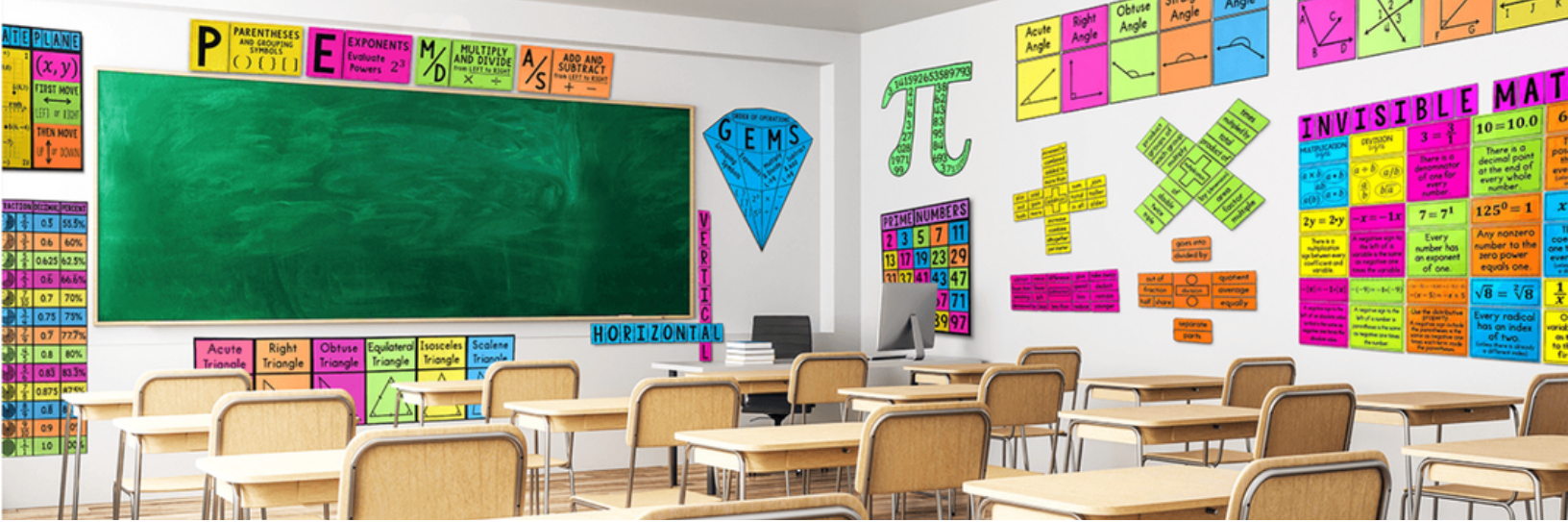
Math Shirt Monday is more than just a dress-up event; it's an opportunity to foster a positive environment around mathematics, encourage creative expressions, and ignite curiosity in our students. Let's unite as educators, showcasing the boundless enthusiasm we have for teaching math.

So, raid your closets for those amazing math-themed shirts, and let's make every Monday a celebration of our collective love for mathematics. Together, we'll create a memorable and inspiring experience that our students will cherish forever.

Join us for Math Shirt Monday, and let's set the stage for an incredible year filled with math pride and spirit!

Happy Math Shirt Monday! ☀️





# New Teachers Section

How do I connect with other new teachers?

This is such a great questions! Being a new teacher, Teaching a new course or grade level, and entering a new profession can be overwhelming, and it is wonderful to have a community to connect with who can empathize with you. Check your most convenient place first: your school and school district! You might be aware of other new hires in your school, but perhaps within your district, you will find other new teachers to connect with that share your experience teaching in the same town. Administrators, other teachers, and your mentor might be able to help you find these teachers. If you met other teachers at the new teacher orientation, look up their email address and reach out!

You might explore teachers groups on social media to connect with other teachers starting out. You can search for your content area or grade level and see if there are associated groups in your area, state, or even outside of where you work! There is nothing wrong with connecting virtually.

Lastly, you might look into structured teaching programs. The Knowles Teaching Foundation is an amazing organization that provides support and community for new math and science teachers from all over the country.

Stay tuned for more new teacher advice in our next issue. Have a pressing new teacher question? Email [info@amtnj.org](mailto:info@amtnj.org) and we will address it in an "Ask AMTNJ" section!

# Implementing Tier I Intervention in High School Math Class

Kara Teehan, Ph.D., President-Elect AMTNJ

Teaching mathematics to a class of students who each have different needs, strengths, and foundational knowledge is challenging for a teacher with any level of experience. There are some students who receive support services from individualized education plans (IEPs), SMART plans, and 504 plans. Some students excel in various learning environments with various implemented instructional techniques. There are students who achieve proficiency and gain comprehension of the content with instruction, practice, and standard support. What about the students who do not achieve mastery of the standards, struggle to understand current topics, and have foundational learning gaps, yet do not qualify for additional support or services? These students are the ones who “slip through the cracks” in math class. They struggle early on in elementary school, and develop some foundational gaps in comprehension for specific standards. They might continue to struggle in middle school, and fall further behind due to ill-equipped systems of intervention. By high school, these students are “just trying to get through”, identify as “not math people” and struggle to ask for help due to lack of knowing the specificity of their content knowledge gaps or learning style needs. Without intervention, these students might pass the required courses for high school, but might struggle in remedial math courses in college or struggle to obtain certification in a job if their job assessment requires a math component. They might feel discouraged and incapable, but this is far from the truth.

The key to addressing this glaring issue lies in academic intervention, or additional instruction and support to supplement the general classroom instruction that is essential for academic performance improvement. Having a designated “math interventionist” is slowly becoming more commonplace in public NJ high schools, but the growth is not happening at a fast enough rate to help the students in need. So what can be done to help these students so that they do not continue to “fall through the cracks” so that they achieve success in their high school math class? A classroom teacher can utilize tier I intervention strategies to address this need. Tier I intervention is sometimes called the “universal tier”. It includes all instruction, assessments, and the general curriculum that students engage with for a course. It is helpful to use a “universal screener” to assess if the majority of the students are successful within the general education program and current curriculum and with the instructional strategies used. Tier I intervention focuses on helping specific students to learn on grade level, fill foundational concept gaps, and trace back content standards to necessary prerequisite skills that a student may still need to master. Tier I intervention is classroom-based, and is typically implemented by the classroom teacher.

Some people would call tier I intervention strategies simply responsive teaching. A tier I strategy might be pre-teaching a student geometry vocabulary words prior to introduction and application with the whole class. This pre-teaching would take place in a small group during independent or collaborative tasks or practice where it is easy to pull small groups without identifying students. The difference between differentiation and intervention is that intervention emphasizes the need for growth within a standard or concept.

Some tier I strategies include using peer tutoring strategically and inclusively, schema-based instruction, emphasizing fact retrieval when working in small groups or having students practice individually, having the student verbalize thought processes under the teacher’s observation, and having the teacher verbalize thought processes while working out problems for the class during instruction, and allowing students to use multiple representations or manipulatives to demonstrate their thinking or to explore a concept. Tier I strategies can also include allowing additional time for assessments, even when a student does not have a specific plan stating they need this, modifying assessments or assignments for length, directions, or answer options, and verbalizing directions for students on assignments and assessments. All of these strategies are inclusive teaching practices that are tier I strategies for intervention, allowing a teacher to address student needs for individuals within the general classroom setting.



# Math Education Student Corner

Attention future math teachers! This corner is for you. We want to feature research, thought pieces, art, and questions by current math education students at the undergraduate or graduate level. Please email [info@amtnj.org](mailto:info@amtnj.org) for more info or to submit a piece of work!

## Puzzle Corner

KenKen is a “grid-based numerical puzzle” that looks like a combined number cross and sudoku grid. Invented in 2004 by a famous Japanese math instructor named Tetsuya Miyamoto, it is featured daily in *The New York Times* and other newspapers. It challenges students to practice their basic math skills while they apply logic and critical thinking skills to the problem.

<b>3—</b>		<b>3</b>	<b>8×</b>
<b>6+</b>	<b>2—</b>		
	<b>2÷</b>		
	<b>4</b>	<b>1—</b>	

# THE ASSOCIATION OF MATHEMATICS TEACHERS OF NEW JERSEY

## SCHOLARSHIP APPLICATION – DEADLINE, April 15, 2024

NAME \_\_\_\_\_

BIRTHDATE \_\_\_\_\_ EMAIL \_\_\_\_\_

ADDRESS \_\_\_\_\_  
\_\_\_\_\_

TELEPHONE # (\_\_\_\_) \_\_\_\_\_

Parent/Guardian//Father's NAME \_\_\_\_\_

SOCIAL SECURITY NUMBER \_\_\_\_\_  
(Needed from finalists)  
OCCUPATION \_\_\_\_\_

Parent/Guardian//Mother's NAME \_\_\_\_\_

OCCUPATION \_\_\_\_\_

BROTHERS AND SISTERS (NAMES AND AGES): \_\_\_\_\_

HIGH SCHOOL \_\_\_\_\_

TELEPHONE NUMBER (\_\_\_\_) \_\_\_\_\_

ADDRESS \_\_\_\_\_

CHOICE OF COLLEGE: #1 \_\_\_\_\_

• \_\_\_\_\_

EXTRACURRICULAR

#2

#3.

ACTIVITIES: \_\_\_\_\_

COMMUNITY SERVICE ACTIVITIES: \_\_\_\_\_

AWARDS AND HONORS: \_\_\_\_\_

### PERSONAL ESSAYS:

1. Submit a 500 word, 12 point double spaced essay addressing why you wish to pursue a career in mathematics education. You may choose to include any special talent or ability or skill you possess which will help you become an effective teacher or you may include how one of your teachers has influenced your career goals.
2. Submit a brief paragraph explaining your need for financial aid.

This application must be accompanied by one official copy of your high school transcript through the first semester of the senior year, a copy of your scores on the SAT or the ACT, and exactly three letters of recommendation, one from an ACTIVE member of the Association of Mathematics Teachers of New Jersey and one from one of your high school math teachers. Each letter should be no more than one page. All information must be typewritten in an easy-to-read font. Handwritten applications cannot be accepted. Applications postmarked after the deadline, April 15, 2024 will not be accepted. Awardees will be introduced and award ceremony held during an AMTNJ Board of Trustees Meeting in May, 2024.

CERTIFICATION: By my signature, I certify that all of the information given by me on this form is true and complete to the best of my knowledge.

SIGNATURE OF APPLICANT DATE \_\_\_\_\_

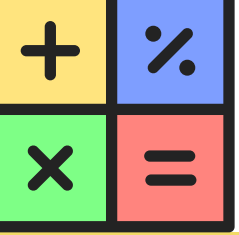
SIGNATURE OF ACTIVE AMTNJ

MEMBER WRITING LETTER OF  
RECOMMENDATION

PRINT NAME \_\_\_\_\_

RETURN BY April 15, 2024 TO: AMTNJ, C/O Joan J. Vas, 10 Edgewater Dr, Matawan, NJ 07747

LATE APPLICATIONS NOT ACCEPTED. TO ENSURE DELIVERY SEND "RETURN RECEIPT"



# Newsletter acknowledgements



Thank you to our authors, contributors, and reviewers for the AMTNJ newsletter!

Editor: Kara Teehan, Ph.D., President-Elect AMTNJ