

NMMATYC News

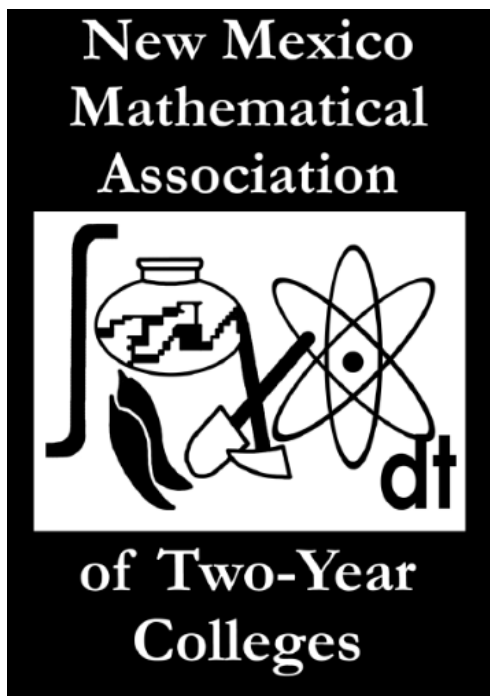
New Mexico Mathematical
Association of Two-Year Colleges

Fall 2013

Make Plans To Attend Our Spring
Conference May 23 & 24 at
Mesalands CC, Tucumcari, NM

Key note speaker:

Ron Larson



2	A Message From The President	Student Scholarships	7
3	A Message From The Vice President	AMATYC Conference	8
4	National Summit on Developmental Mathematics	IS $i (= \sqrt{-1})$ AN IRRATIONAL NUMBER?	9
5	Mu Alpha Theta	Beautiful Dance Moves	10
6	David Lovelock Teaching Excellence Award	NMMATYC Board	11

A Message From The President

- Philip Kaatz

Greetings fellow NMMATYC members,

Our fall semester is nearly over and Thanksgiving is just around the corner! We have a lot to be thankful for. Here in eastern New Mexico we had some nice rainstorms this summer (at least compared to several recent years). The fall has been dry again but the mountains are getting snow already so we are hopeful of a decent spring run-off.

Several of us just got back from the annual AMATYC conference which was held in Anaheim, CA this year. There should be some pictures in this newsletter. I personally enjoyed the conference a lot and got many useful resources for my classes. If you are not a member, you should consider joining AMATYC as the organization has a lot of resources available for you. Some of the speakers at this year's conference have made their resources available on the AMATYC conference website at: <https://amatyc.site-ym.com/?page=2013ConfProceedings>. There was some discussion at the conference of making a members-only section of the AMATYC website, but for now, all resources are available to everyone.

If you are a new full time faculty member (1-3 years), I would encourage you to apply to AMATYC's Project ACCESS. The project's goal is to provide experiences that will help new faculty become more effective teachers and active members of the broader mathematical community. If selected, you will attend special sessions at the annual AMATYC conference each fall and will network through the AMATYC Project. For further information please visit the AMATYC website

<http://access.matyc.org/>

The 25th annual NMMATYC conference will be held at my home college, Mesalands Community College, in Tucumcari, NM on Friday and Saturday, May 23-24, 2014. Planning is still in the early stages but as details become available they will be posted on our website,

<http://www.nm.matyc.org>.

As usual, we are planning to honor our top students at the conference through the Michelle Jimenez Scholarship, the Vicki Froehlich Scholarship, and the Student Mathematics League participants. Please notify your best students of these scholarships and to encourage them to apply. Applications will be due in April, 2014. Information and application forms will be available on our website <http://nm.matyc.org>.

Please visit our conference link (in the new year) and consider presenting at next year's conference. We all have different areas of expertise and have had different math teaching experiences. Sharing this expertise and these experiences is a great way for us to grow professionally and to be better instructors. There will be multiple presentation times at this year's conference. We are also planning a special presentation section of student talks. You can also contact our conference chair, Forrest Kaatz, anytime at forrestk@mesalands.edu.

I hope you all have an enjoyable winter break and please plan on coming to next year's NMMATYC conference in Tucumcari. Also, please feel free to contact me or any member of the Board if you have any ideas or thoughts that will help to improve the NMMATYC organization.

Best regards,

Philip Kaatz



Topics Affecting Mathematics Education Today

I was hoping to write an informative article about a topic that is currently important in mathematics education, such as common core standards changes, developmental education redesign, or availability of open source books. However, I have to admit that I haven't been able to concentrate on any of these topics. Currently, I am on sabbatical and when I wrote this article I was sitting at my brother and sister-in-law's farm in New South Wales, Australia, and watching the Grand Final of Australian League Football. So I was a bit distracted, and these topics were not on my mind right then. However, all of these topics and more are immensely important today.

Forty-five states have adopted the common core standards. When students who are being taught using these standards come to community colleges, there may be some changes of what community colleges need to teach. I realize that not all states in the southwest region have adopted the common core standards, but their existence affects all of us. So schools may want to start looking at the standards and see what curriculum changes could be recommended.

Developmental education redesigns are being proposed all over the country. Some of the redesigns are accelerated courses, emporium models, and student mentors. You can find out more about redesign models at an AMATYC conference, such as the Annual AMATYC meeting in Anaheim, October 31 through November 3, 2013. If you cannot attend the conference, there are webinars that AMATYC offers and also conference proceedings are posted on the amatyc.org website. Members of AMATYC receive emails with information about webinars and conferences, so become a member of AMATYC to keep informed. Information on being a member can be found at amatyc.org.

With the rising price of textbooks, many faculty are looking for better options for textbooks. Some of these faculty are writing textbooks and publishing them as open source books. There is even an open source homework system that exists. When choosing textbooks, you may consider reviewing the many open source textbooks out there. Please note, AMATYC doesn't have a position statement on open source textbooks,

A Message From The Vice President

- Kathryn Kozak



, and my suggestion to use an open source textbook is my own opinion and not AMATYC's.

There are many other topics that are important to faculty at community colleges. Many of these have been addressed by AMATYC. Consider being a member so you can be a more active voice in mathematics education. More information can be found at amatyc.org.

Kathryn Kozak

VP of the Southwest Region of AMATYC

National Summit on Developmental Mathematics

On October 29 and 30 (immediately preceding the 2013 AMATYC conference in Anaheim, CA), a summit about developmental mathematics was held. This was first Paul Nolting's idea, and he convinced AMATYC and NADE to become sponsors of this summit. We had a day and a half of intense work, talking about many of the new initiatives in developmental mathematics.

The "Sponsors" AMATYC and NADE put up most of the money, the "Co-Sponsors", Paul Nolting, Learning Specialist, NCDE (National Center for Developmental Education), and the Carnegie Foundation for the Advancement of Teaching, also helped out. The Charles A. Dana Center and the MAA (Mathematical Association of America) were "Partners" for the summit, and as such participated in the presentations throughout the summit.

To see the power points and learn some about what is happening around the country, please go to the following web site:

<https://sites.google.com/site/amatycdmc/national-mathematics-summit>

The aim of the summit was to start a national discussion (it is hoped that this discussion will continue at the NADE conference in the spring of 2014); to inform people (instructors and administrators) of what is happening nationally in the area of developmental mathematics; and to help colleges that have been mandated to redesign their developmental courses at least get started on a path that has a chance to be successful for that college. Each college has its special needs, and not all redesign ideas will fit that college.

Have You Heard of Mu Alpha Theta?

Mu Alpha Theta is an Honor Society for high schools and two-year colleges. It provides a way to interest/inspire students in mathematics. There are over 2000 schools participating; there are national conventions; scholarships for members; and much more. Go to www.mualphatheta.org to find out more.

Why should Two-Year Colleges be interested in $\mu\alpha\theta$? Well, we are recruiting math majors, and $\mu\alpha\theta$ members would be a good place to start. If there is a math club at your college, perhaps it could become a $\mu\alpha\theta$ chapter. Our $\mu\alpha\theta$ chapter, at El Paso Community College, Transmountain campus invites speakers (and we are always looking for more), and we are planning “field trips” to nearby universities (UTEP, NMSU, and NMT). You can contact Melinda Camarillo (mramos91@epcc.edu) for more information about what she is doing with our students. Also, we have an Early College High School on campus, which also has a $\mu\alpha\theta$ chapter – so there are joint meetings.

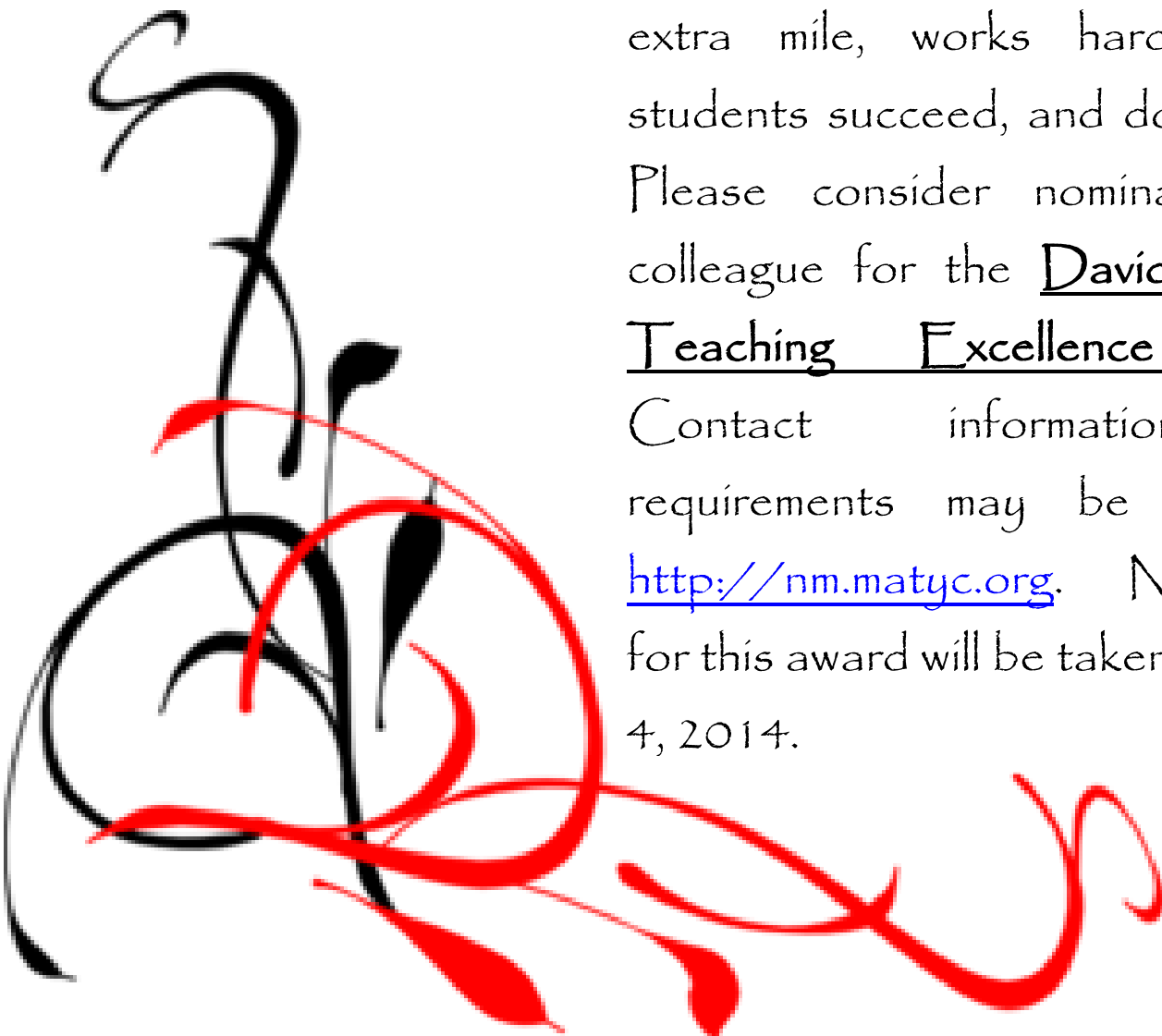
If there are no $\mu\alpha\theta$ chapters in nearby high schools, your college can sponsor a chapter for one or more of the nearby high schools. Getting nearby high school students who are interested in mathematics to visit your math department is a good way to recruit math majors.

Joanne Peebles

Sponsoring partners of $\mu\alpha\theta$ are: MAA, SIAM, AMATYC and NCTM

NOMINATIONS WANTED

Do you have a colleague who teaches mathematics and goes the extra mile, works hard to help students succeed, and doesn't quit? Please consider nominating your colleague for the David Lovelock Teaching Excellence Award. Contact information and requirements may be found at <http://nm.matyc.org>. Nominations for this award will be taken until April 4, 2014.





**Michelle Jimenez Memorial
and
Vickie Froehlich Memorial**

If you know of a student that has completed a minimum of 12 credit hours (6 hours must be from a New Mexico or El Paso 2-year college), maintained an overall GPA of 3.2 and a cumulative GPA of 3.5 in all MATH courses, please refer them to the NMMATYC website at <http://nm.matyc.org> so that they may apply for both of our available scholarships. Each scholarship is in the amount of \$500. The deadline to apply is April 4, 2014.

Scholarship winners for 2013



Ashley Cook
Michelle Jimenez
Scholarship
UNM Valencia



Laralee Hansen
Vicky Froehlich
Scholarship
DACC



Trey Griffin
Celeste Nossitor Book
Award
EPCC

2013 AMATYC Conference

Anaheim, CA Oct. 31- Nov. 3



Saturday Evening NMMATYC
Dinner at AMATYC

Adrian Delgado
Dona Ana Community College
Project ACCCESS – Cohort 10

Being a first time attendee to the AMATYC conference, I am glad to have been able to participate in Project ACCCESS. I had an opportunity to collaborate with other first year instructors around the nation and attend workshops on various topics. Being involved in Project ACCCESS helped me as a new instructor to create ties with other fellows and participate in sharing new ideas to incorporate in the classroom. I am enthusiastic to implement the new ideas from this experience in my classroom. I am excited for the next AMATYC conference in Nashville and to pass on the experience to future Project ACCCESS fellows. I highly encourage new faculty to participate in Project ACCCESS, as it is an amazing experience!

Mark your Calendar!!!...
AMATYC Conference 2014
Nashville, TN Nov, 13-16
"Y'all Come"

IS $i (= \sqrt{-1})$ AN IRRATIONAL NUMBER?

By: George A. Sanchez

I am a retired math teacher who loves mathematics and would still be teaching at the High School or Community College Level except that I have a genealogy hobby that takes up most of my time. I prefer to use the time I do have to continue reading and learning mathematics from The Great Courses (video courses by The Teaching Company) which I would not have the time to do if I was still a teacher.

I want to point out something I learned from Professor Edward B. Burger's course "Zero to Infinity: A History of Numbers" (I also have another course in Number Theory by Dr. Burger and a few other math courses from The Great Courses series published by The Teaching Company. These courses are videos accompanied by a course guide book.)

In Dr. Burger's course, "Zero to Infinity: A History of Numbers", lecture 16, he makes the statement "Because i is not real, it cannot be a rational number; hence, it is **irrational**." Then in lecture 17 he uses that **i is algebraic and irrational** to prove that **e^π is a transcendental number**.¹

Dr. Burger's proof by contradiction that e^π is a transcendental number:

Assume that **e^π is an algebraic number**. Recall that i is an **algebraic, irrational** number. So from The **Gelfond-Schneider Theorem**, if an algebraic number not equal to 0 or 1 is raised to an algebraic irrational power, then the result is a transcendental number. Thus, **$(e^\pi)^i = e^{\pi i} = e^{\pi i} = -1$** , from **Euler's Equation $e^{i\pi} + 1 = 0$** . But -1 is an algebraic number (not transcendental). We arrived at a contradiction of the **Gelfond-Schneider Theorem**; therefore our assumption that **e^π is an algebraic number** must be false. We have just proved that **e^π is a transcendental number**.

Guess what, after teaching for close to 30 years in both High School and college courses up to Calculus II, I did not know that the imaginary number **$i (= \sqrt{-1})$** was an irrational number!¹ I thought that only Real Numbers were either rational or irrational! I did communicate with Dr. Burger and he explained my "misunderstanding".

Dr. Burger said, "You are correct that Real Numbers are either rational or irrational, but those are not the only ones that are irrational."

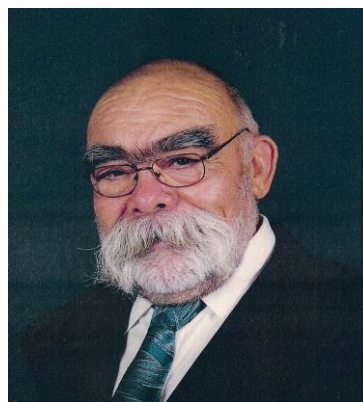
I have discussed this idea with many math teachers of the same levels I taught and with math professors at the Community College and University level and I have yet to find one that knew that **$i (= \sqrt{-1})$** is irrational!

What do you think? Irrational? or, Not?

Two of the math professors that I have contacted and asked if they thought that **$i (= \sqrt{-1})$** was irrational are both of the opinion that only Real Numbers are either rational or irrational so **$i (= \sqrt{-1})$** being an imaginary number cannot be irrational. They both told me about a Wikipedia site where I could get more information on the **Gelfond-Schneider Theorem**. There we find that this theorem is used to establish the transcendence of a large class of numbers. The theorem was independently proven by Aleksandr Gelfond and Theodor Schneider in 1934. This theorem solved Hilbert's Seventh Problem.

The theorem states: If a and β are algebraic numbers with $a \neq 0, 1$ and if β is not a rational number, then any value of $a^\beta = \exp(\beta \log a)$ is a transcendental number. In the theorem, a and β are not restricted to real numbers, they may be complex numbers, and the "log" is the complex logarithm.

We see that the **Statement** here of the **Gelfond-Schneider theorem** is different from that used by Dr. Burger. The only requirement for the exponent here is that the exponent be **algebraic** and not **rational**. Since **$i (= \sqrt{-1})$** is **algebraic** it was not necessary for Dr. Burger to state that **$i (= \sqrt{-1})$** is **irrational** since most of us think that since i is not a Real Number, it is neither **rational** or **irrational**.



George A. Sanchez

Beautiful Dance Moves



$\sin(x)$



$\cos(x)$



$\tan(x)$



$\cot(x)$



$|x|$



x



x^2



$x^2 + y^2$



\sqrt{x}



$\sqrt{-x}$



$\frac{1}{x}$



crap.

2012-2013 NMMATYC Board

Past – President	Ali Ahmad (Dona Ana C.C.)	mailto:aahmad@nmsu.edu
President	Phillip Kaatz (Mesalands C.C.)	philipk@mesalands.edu
President-Elect	Diana Orrantia (El Paso C.C.)	mailto:dianoo@epcc.edu
Treasurer	Rachel Black (Central N.M. C.C.)	rblack8@cnm.edu
Secretary	Melinda Camarillo (El Paso C.C.)	mramos91@epcc.edu
Newsletter Editor	Joanne Peeples (El Paso C.C.)	joannep@epcc.edu
Membership Committee Chair	Suzanne Hill (Dona Ana C.C.)	mailto:suhill@nmsu.edu
Nominating Committee Chair	Elizabeth (Liz) Gamboa (Dona Ana C.C.)	egamboa@dacc.nmsu.edu
AMATYC Delegate	Joanne Peeples (El Paso C.C.)	joannep@epcc.edu
Conference Chair 2014	Forrest Kaatz (Mesalands C.C.)	forrestk@mesalands.edu
Web Master	Ali Ahmad (Dona Ana C.C.)	mailto:aahmad@nmsu.edu
Articulation Task- Force Liaison	Alyne Fulte (New Mexico State Univeristy)	mailto:afulte@math.nmsu.edu

(Special Thanks to [Danielle Robinson](#) for helping put this newsletter together.)