

# MAΘ 2021 National Convention

## Virtual and In-Person—July 12-15, 2021

The 2021 Mu Alpha Theta National Convention, will be held July 12- 15, 2021, with two options for participating: virtually (taking the tests online) or in-person at your location (meeting safely in-person at your location to take pencil-and-paper tests).

The same tests will be used in-person and online, with the online tests being administered after the in-person tests have begun. A student cannot take the same test in-person and online—they must choose one way or the other to participate. Everyone in your chapter does not need to take the tests the same way. Members who take the tests online will compete only against the other online test takers. Members who take the tests in-person will compete only against the other in-person test takers. However, all members must be proctored by their sponsor, even those taking the test online. Only the scores of those participating in the in-person test taking will count towards the Sweepstakes determination. Students must be registered as a convention participant if they want to participate in any part of the convention.

Registration will open on April 1, and all sponsors will receive an email with registration instructions. All participants must be registered members or associates by the time they're registered and their chapter must be in active status at least until July 31, 2021.

The registration fee is \$50 per in-person participant and \$20 per online participant registered prior to June 1. No registrations will be accepted after June 1. **All payments must be postmarked to the Mu Alpha Theta National Office no later than June 1.**

You will need to gather the following information for participant registration:

1. Participants: Last name, first name, division (sponsor, M, A, T), and test type (online or in-person)
2. Topic test registration: Total number of students taking each test. (Topic test lists found on p. 7 of this packet)
3. Names of Chalk Talk participants and level
4. Sponsor job preferences

Please check your email (including your junk mail inbox) regularly for information pertaining to the National Convention or specific to your school. **Any questions?** Email [info@mualphatheta.org](mailto:info@mualphatheta.org)

### **Important dates to remember:**

**April 1**- Registration opens

**June 1**- Registration closes and all payments and all completed student participation policies are due to the National Office

**June 5**- Sponsor Orientation via Zoom- 2pm ET. Link will be sent to all registered sponsors.

**June 25**- Chalk Talk participant form due to National Office. Preliminary video submission must be posted to YouTube by today.

**July 5**- Chalk Talk finalists informed of their status

**July 12**- National Convention begins! Chalk Talk finalists will compete live.

**July 15**- Posters due. National Convention ends. Answers posted and disputes open.

**July 16**- Disputes close

**July 20**- Awards Ceremony for online test takers, including Chalk Talk and Poster, posted to YouTube

**July 22**- Awards Ceremony for in-person test takers posted to YouTube

## 2021 MAΘ NATIONAL CONVENTION SCHEDULE

### IN-PERSON

All times US Eastern

#### DAY 1 (12 July)

2:00 pm Opening Ceremonies

5:00–8:00 pm Chalk Talk Finals

#### DAY 2 (13 July)

2:00 pm Topic 1

3:30 pm CIPHERING

\*1 hour break between the end of CIPHERING and the beginning of Bowl\*

6:00 pm Bowl

#### DAY 3 (14 July)

2:00 pm Topic 2

3:30 pm Individual

\*1 hour break between the end of Individual and the beginning of Topic 3\*

6:00 pm Topic 3

#### DAY 4 (15 July)

2:00 pm Poster due

Answers posted and disputes link open

#### DAY 5 (16 July)

2:00 pm Disputes due

20 July 7:00 pm Online Awards (including Chalk Talk and Poster) Ceremony on YouTube

22 July 7:00 pm In-Person Awards Ceremony on YouTube

# 2021 MAΘ NATIONAL CONVENTION SCHEDULE

## ONLINE

All times US Eastern

### DAY 1 (12 July)

2:00 pm Opening Ceremonies

5:00–8:00 pm Chalk Talk Finals

### DAY 2 (13 July)

2:30 pm Topic 1

4:00 pm CIPHERING

\*1 hour break between the end of CIPHERING and the beginning of Bowl\*

6:30 pm Bowl

### DAY 3 (14 July)

2:30 pm Topic 2

4:00 pm Individual

\*1 hour break between the end of Individual and the beginning of Topic 3\*

6:30 pm Topic 3

### DAY 4 (15 July)

2:00 pm Poster due

Answers released and disputes link open

### DAY 5 (16 July)

2:00 pm Disputes due

20 July 7:00 pm Online Awards (including Chalk Talk and Poster) Ceremony on YouTube

22 July 7:00 pm In-Person Awards Ceremony on YouTube

## Mu Alpha Theta National Convention 2021

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Participant's printed name

School

### **Student Participation Policies**

Please read the following and indicate your acceptance by your signature(s) where applicable.

NOTE: NO STUDENT MAY PARTICIPATE IN THE NATIONAL CONVENTION WITHOUT THIS FORM ON FILE.

#### **Rules of Conduct**

- Participant agrees to conduct himself/herself in a manner appropriate for a member of an honor society.
- Participant agrees not to cheat in any way.
- Participant agrees that failure to follow any of these rules will result in disqualification from the convention without benefit of any refund.

Participant's signature

Date

Parent/Guardian's signature

Date

#### **Release and Indemnity Agreement**

The undersigned participant, and their parents or legal guardians of the participant who is a minor, in consideration of being permitted to participate in the Mu Alpha Theta National Convention, and for other good and valuable consideration do hereby release, waive and discharge Mu Alpha Theta, its Governing Council, and Convention committee from all manner of action, causes of action, suits, damages, judgments, or claims for personal injury or death or loss of personal property, and any loss, damage, expense or cost including any lodging, meals, ground or air travel which may be incurred by either the undersigned participant or the undersigned parents or legal guardians of such participant, arising out of any participation in the National Convention.

The undersigned participant and his/her parents or legal guardians agree to indemnify Mu Alpha Theta, its Governing Council and convention committee for any financial liability or damages incurred which were caused in whole or in part, by the negligence of intention act of the participant while participating in the National Convention.

Participant signature and date

Parent/legal guardian signature and date

## 2021 National Convention

### COMPETITION INFORMATION

Each student is to be registered in one of the three levels defined below.

**THETA** level is for associate or full members who have completed Geometry and/or Algebra II but have not been enrolled in a higher-level mathematics course.

**ALPHA** level is for full members who have completed math courses above Algebra II but have not been enrolled in Calculus.

**MU** level is for full members who have completed a Calculus course. Students competing in this division will be expected to know and be tested on all levels of math not just Calculus.

### TYPES OF COMPETITIONS

A student *may* take a test at a higher level but NOT at a lower level. The **OPEN** level topic tests are not limited to students in any particular level. However, students should carefully examine test content descriptions before making their selections.

Sponsors are responsible for proctoring all their members- both in-person AND online test takers- during the tests. Members will only compete against other members who are taking the tests in the same way they are. Online test takers' scores are not eligible towards the Sweepstakes determination.

\*\*\*\*FOR CHAPTERS TAKING THE IN-PERSON TESTS: Sponsors will need to print the in-person tests themselves. Sponsors must overnight or certified two-day ship all their team's answer sheets for arrival in Florida by no later than Friday, July 16 (address and additional specific instructions will be provided to those registered as in-person test-taker Sponsors). Please remember to keep record of your members' answers for disputes.\*\*\*\*

#### **Individual Tests: (T, A, M)—*NO Calculators***

- 30 multiple choice question written test covering all topics applicable to the level
- 60-minute time limit
- Scoring will be 5 points for each correct answer, 1 point for a blank, 0 for an incorrect answer
- Ties will be broken by the sudden death method (first missed answer).
- Certificates will be given to places 1-20 for each division.

#### **Topic Tests: (T, A, M, O)—*NO Calculators***

- 30 multiple choice question written test.
- Descriptions of topic tests are included in this packet.
- 60-minute time limit, except History of Math which has a 30-minute time limit.
- Scoring will be 5 points for each correct answer, 1 point for a blank, and 0 for an incorrect answer.
- Ties will be broken by the sudden death (first missed answer) method.
- Certificates will be given to places 1-15 for each test.

#### **Ciphering: (T, A, M)—*NO Calculators***

- 12 open response questions administered individually.
- 3-minute time limit per question.
- Scoring - twelve points for a question answered correctly in the 1st minute, eight points in the 2<sup>nd</sup> minute, and four points for a question answered correctly in the 3<sup>rd</sup> minute. A sliding scale will be used.
- Certificates will be given to the top 20 students in each division.

## Mu Alpha Theta National Convention 2021

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### ***School Bowl:*** (T, A, M)—***NO Calculators***

- Top 4 individuals from each school per division as determined by the Head sponsor.
- 12 open response questions administered one at a time.
- Time limit - 4 minutes per question with points awarded depending on the minute in which the question is answered correctly.
- 16 points for questions answered correctly in the 1<sup>st</sup> minute, 12 pts in the 2<sup>nd</sup> minute, 8 pts in the 3<sup>rd</sup> minute, and 4 pts in the 4<sup>th</sup> minute.
- A sliding scale will be used.

### ***Division Awards***

These will be given to the top 10 schools in each division by combining the top 4 individuals' scores (determined by the sum of their individual test score and their ciphering score) with their bowl score. Certificates will also be emailed to the 4 individuals on the top 10 teams.

## **Sweepstakes Scoring**

***Sweepstakes:*** Certificates will be emailed to the top 15 schools.

The overall sweepstakes award is calculated from the scores of all tests and competitions. The sweepstakes score is calculated as follows: First a t-score is calculated for each individual competition score. A t-score is calculated using the formula  $t = 10z + 50$ . In this formula,  $z$  is the standard score (or z-score) and represents the number of standard deviations above or below the mean a particular score is located. The z-score is equal to  $(x - \mu)/\sigma$ , where  $x$  is the actual team score,  $\mu$  is the mean score, and  $\sigma$  is the standard deviation of all the team scores. For each test, the t-scores have a mean of 50. After each t-score is calculated, it is multiplied by a weighing factor so that each competition has a value relative to its importance.

Competition	Num	% Ea	Tot. %
Division (Indiv, Bowl, Ciph) *Top 4 in M,A,T	3	20	60
Topic Tests: Top student from ea. sch. on ea. test	30	4/3	40
Total Weighing Points			100%

So that sponsors and students can get a better feeling for the relative importance of each competition, the table above gives the **approximate** percentage for each competition.

## Topic Tests

Each student must register for one topic test for each round. Please indicate the number of students taking each test when you register online. Students may take any topic test in their division, a higher division or any that are designated as open.

<u>Round One</u>	<u>Round Two</u>	<u>Round Three</u>
Theta-Triangles	Theta-Applications	Theta-Conics & Analytic Geom
Theta-Circles and Polygons	Theta-Numbers & Probability	Theta-Logs & Exponents
Theta-Area & Volume	Theta-Equations & Inequalities	Theta-Sequence & Series
Alpha-Trigonometry	Alpha-Applications	Alpha-Sequences & Series
Alpha-Matrices & Vectors	Alpha- Equations & Inequalities	Alpha-Analytic Geometry
Alpha-Math in Physics	Alpha-Combinations & Probability	Alpha-Complex Numbers
Mu-Limits & Derivatives	Mu-Applications	Mu-Areas and Volumes
Mu-BC Calculus	Mu-Integration	Mu-Sequence & Series
Mu-Math in Physics	Mu-Combinatorics & Probability	Mu-Comprehensive
Open-History of Math	Open-Codes and Ciphers	Open-Number Theory

## Descriptions of Topic Tests

Calculator use – **NO calculators allowed on any test or bowl.**

**Theta Level Tests – Tests are written at the Alg II level and may contain concepts from Alg II and/or Geo**

*Triangles*-any topic using triangles (including special right triangles)

*Circles and Polygons*-any topic using circles (including some conics) and polygons

*Area & Volume*-any Geometry topic that involves area and volume

*Equations & Inequalities* -elementary equations and inequalities

*Theta Apps* -applications of Algebra 2 and Geometry concepts

*Conics & Analytic Geometry* -any problem using all conic formulas and basic analytic geometry

*Logs & Exponents* -elementary logarithms and exponents

*Numbers & Probability*-problems using probability, permutations, combinations, binomials expansion, and introductory number theory

*Sequences and Series*-problems involving any type of series, including applications

**Alpha Level Tests – Tests are written at the Pre-Calculus level.**

*Trigonometry*-any topic involving the use of trigonometry

*Math in Physics*-These problems will be based on material from AP Physics 1 and 2

*Alpha Applications*-applications of pre-calculus concepts, may include trigonometry

*Analytic Geometry*- basic analytic geometry, conics, alternative coordinate systems,

*Sequences and Series*- problems involving any type of series, including applications

*Complex Numbers* -any topic involving complex numbers

*Matrices and Vectors*- problems involving matrix operations and vector properties and operations

*Equations & Inequalities* -elementary equations and inequalities

*Combinations & Probability*-problems using probability, permutations, and combinations

**Mu Level Tests – Tests are written to cover all levels of math up to calculus but not limited to calculus**

*Limits & Derivatives* —any problem relating to limits and derivatives of functions of one variable or graphs

*Mu Applications* —Applications of Calculus, including optimization and related rates

*Areas & Volumes* -ALL methods of finding or approximating areas under curves or between curves including polar and ALL methods of finding volumes of solids of rotations as well as volumes of irregular shapes using cross sections

*Sequences & Series*- all sequences and series topics, including calculus-based series such as Taylor series

*Integration* -any problem relating to integrals of one variable

*BC Calculus*- any topic that is on the AP Calculus BC syllabus from the AP office

*Math in Physics*-These problems will be based on material from the AP Physics 1, 2, and C courses.

*Combinatorics & Probability*- advanced problems using probability, permutations, and combinations. Some questions will require Calculus knowledge.

*Limits & Derivatives*- any problem relating to limits and derivatives of functions of one variable or graphs

*Mu Applications*- Applications of Calculus, including optimization and related rates

*Math Comprehensive* -these problems will cover higher level math with NO Calculus.

### **Open Level Tests**

*History of Math*- the topic is open...there is no specific era or topic

*Number Theory* - advanced number theory, factors, primes, modulo, bases, etc

*Codes and Ciphers*-These questions will require understanding of codes and ciphers



### **Chalk Talk: (T, A, M)**

*Not a Sweepstakes Event*

Speeches given by students on the specified topic.

- Each school can have one presenter for each level Theta, Alpha, Mu.
- See judging form included in this packet for more specific information on presentations.
- 10-12 people from each division will advance to the final round (based on participation totals after registration)
- *Theta topic – Math and the Ocean*
- *Alpha topic – Math and Water Parks*
- *Calculus topic – Math and Astronomy*
- Certificates will be emailed to the top 10-12 in each division.
- Students will be presenting their talk via Zoom. More specific information is with the judging sheet.



## **Chalk Talk Topics and Guidelines & Judging Sheet**

I. Topics for each division are:

**Theta topic – Math and the Ocean**

**Alpha topic – Math and Water Parks**

**Mu topic – Math and Astronomy**

II. Students will have 7 minutes of uninterrupted time for their presentation on the topic above. Students will record their first round presentation using their computer and upload that recording to YouTube as 'unlisted'. They should use a platform they are comfortable with. The student will be expected to share their screen to present their work as they talk. The student may ONLY USE paper and a writing tool of their choice to use to present their talk. ("Paper and a writing tool" should be understood as: students can use a polycam if they have access to one, an online tool, a digital whiteboard program, or a document camera to present their talk.) The students are expected to research and prepare their talk as they always have, but in the actual talk, we will see the student speaking and using the share screen to show their work using the paper and writing tool, and that is all. The recording should be a CONSECUTIVE 7-minute presentation with NO EDITING AT ALL. If the judges believe that the first round presentation has been edited, that participant will be disqualified. Sponsors will complete to the MAT National Office a forthcoming form including the students' names and links to their presentations by June 25, 2021. The first round of entries will be judged before the start of the convention.

III. The top 10-12 students in each division will advance to the final round (amount will depend on participation totals after registration). These members will be notified by email on July 5 and will present in front of judges via Zoom on July 12 during their allotted appointment time between 5-8 pm ET. They will present their 7-minute chalk talk LIVE. The format will be just like the first round. The students will speak to the convention participants watching and share their screen to show their work with paper and a writing tool. Warnings will be given when one minute remains and when 15 seconds remain FOR THE FINAL ROUND ONLY. Presentations will be cut off at the 7-minute mark FOR THE FINAL ROUND ONLY.

IV. Chalk Talk presentations will be judged on the following scale shown below.

Two judges will be assigned each presentation in the preliminary round, for a total of 100 points.

Three judges will be assigned each presentation in the final round, for a total of 150 points.

V. The Chalk Talk Finals are open to all convention participants to watch. The link will be sent to all participants for each of the three divisions.

VI. Each school may enter one person per division, and they must register on the Competition Sign-Up form.

VII. Mu Chalk Talks must have elements of Calculus. Alpha Chalk talks must have elements of Pre-Calculus, which could include Trigonometry and introductory limits. Theta Chalk talks must have elements of Algebra/Geometry.

**Please contact Rob Snow at [robsnow23@yahoo.com](mailto:robsnow23@yahoo.com) if you have specific Chalk Talk questions.**

## Chalk Talk Judge's Sheet

NAME \_\_\_\_\_ SCHOOL \_\_\_\_\_

### Content

Knowledge of subject	1	2	3	4	5
Accuracy of math used	1	2	3	4	5
Appropriateness of math used	1	2	3	4	5
Originality	1	2	3	4	5
Relevance of facts to topic	1	2	3	4	5

### Presentation

Clear articulation	1	2	3	4	5
Addressed to audience	1	2	3	4	5
Use of white board or flip chart	1	2	3	4	5
Wow Factor!!	1	2	3	4	5
Use of time	1	2	3	4	5

Judge's comments: (on side and back of the paper)

Total: \_\_\_\_\_

# POSTER COMPETITION

- There will be two categories for this year, 2021 (digital and traditional)
- Certificates in each category will be awarded. This will NOT be included in sweepstakes.
- Only one poster per school is allowed; again, schools can only compete in **ONE** poster **category**.
- The entire poster must be constructed during the Convention from the time the theme is announced during opening ceremonies until it is DUE. Time will be announced.
- All students may work as a team during this event.

## Digital Poster:

- PNG format, 18 inch x 24 inch ratio
- STUDENT artwork ONLY! No part of the poster should come from other people  
*we want to showcase **student art** (not a collage of other people's work)*
- DO NOT put any indication of your school on the front  
*judges shouldn't know which school the poster came from!*
- submit a HIGH resolution image (prefer PNG format)  
*if we can't see it then we can't grade it*

## Traditional Poster:

- Use a BLANK, WHITE, 18 inch x 24 inch size poster board
- Attach NOTHING to your poster with glue, tape, etc.
- DO NOT put any indication of your school on the front  
*judges shouldn't know which school the poster came from!*
- submit a HIGH resolution image (prefer PNG format)  
*if we can't see it then we can't grade it*

## JUDGING:

A panel of up to seven judges will judge. The high and low scores will be thrown out, and the remaining scores will judge the posters. All decisions of the judges will be final. Posters will be judged in the areas of originality, attractiveness, demonstration of theme, and use of mathematical concepts. Judging sheets will be provided for your poster- No need to copy. SEE Judging Form- Below. The tiebreaker is the total score of the judges in the Content category. If there is still a tie, then the Artistic Quality and Overall Effect category will be used in that order until the tie is broken.

