



MOAA 2023  
The Sixth Annual  
Math Open At Andover

A MIDDLE SCHOOL MATH COMPETITION  
AT PHILLIPS ACADEMY ANDOVER  
<https://andovermathopen.com>

SATURDAY, OCTOBER 7TH, 2023

# Schedule

| Time (EST)          | Event                                | Location          |
|---------------------|--------------------------------------|-------------------|
| 8:00 AM - 8:30 AM   | Registration                         | Kemper Auditorium |
| 8:30 AM - 9:00 AM   | Opening Ceremony                     | Kemper Auditorium |
| 9:15 AM - 10:45 AM  | Talk by Po-Shen Loh for Parents      | Kemper Auditorium |
| 9:15 AM - 10:00 AM  | Team Round                           | Morse             |
| 10:00 AM - 11:15 AM | Speed Round & Accuracy Round         | Morse             |
| 11:30 AM - 12:00 PM | Lunch                                | Morse             |
| 12:15 PM - 1:00 PM  | Admissions Q&A/Tiebreakers           | Kemper Auditorium |
| 1:00 PM - 2:00 PM   | Speaker Session                      | Kemper Auditorium |
| 2:00 PM - 3:15 PM   | Gunga Bowl                           | Kemper Auditorium |
| 3:15 PM - 3:45 PM   | Talk by Po-Shen Loh for Participants | Kemper Auditorium |
| 3:45 PM - 4:15 PM   | Closing Ceremony                     | Kemper Auditorium |

# Competition Format

There will be four rounds in the competition: two individual rounds and two team rounds. For individual rounds, students may not collaborate with anyone else, including teammates. For team rounds, teammates may freely collaborate amongst themselves, but not with any other students. Every problem in the competition can be solved using middle school level mathematical techniques. Every answer will be a non-negative integer less than 1,000,000.

## Speed Round

The Speed Round is a 10-question individual test to be completed in 20 minutes.

## Accuracy Round

The Accuracy Round is a 10-question individual test to be completed in 45 minutes.

## Team Round

The Team Round is a 15-question team test to be completed in 40 minutes.

## Gunga Bowl

Inspired by the Harvard-MIT Mathematics Tournament's Guts Round, the Gunga Bowl is a fast-paced race between teams featuring a live scoreboard and timer. The Gunga Bowl is composed of 9 rounds of 3 problems each, to be completed in 60 minutes. Later rounds will increase in difficulty and in point values. Each round can only be accessed after completing the previous round. Students may only submit one time for each round of the Gunga Bowl.

## Competition Rules

No electronic devices or calculation aids (including calculators, phones, online resources, and computer programs) are permitted on any portion of the MOAA, nor will they be necessary to solve any of the problems. No mathematical texts or notes of any kind are permitted. Compasses, protractors, rulers, straightedges, graph paper, blank scratch paper, and writing implements are permitted, so long as they are not designed to give an unfair advantage.

Integrity is of the utmost importance in any competitive event. Any team discovered to be providing or receiving unauthorized aid by any means in any portion of the competition will be immediately disqualified and permanently banned from future editions of the MOAA.

# Pre-Competition Communication

We will conduct our communication with competitors over email. Teams will be required to provide the contact information of an adult who will be considered the Team Coach. Be sure to consistently check the emails provided during registration prior to the competition date. It is the responsibility of the Team Coach to ensure that every team member receives the information sent out before the competition.

After registration, competitors and coaches will be sent an email regarding registration fees and other general information about the contest. On the day prior to the competition, competitors and coaches should receive an email with Team IDs and Individual IDs, which will be necessary for answer submission during the competition. In-person competitors will also receive details on parking arrangements for the day of the competition at that time.

If competitors or coaches do not receive any emails in the weeks prior to the competition, be sure to check Spam for our emails. Otherwise, email [director@andovermathopen.com](mailto:director@andovermathopen.com) with any questions or concerns.

# Information for Virtual Competitors

Zoom Link: TBD

Virtual competitors should remain in the Zoom meeting for every round of the competition so that they receive up-to-date information on when each round of the competition starts. If competitors are not in the Zoom meeting during the competition, they may miss out on important information.

We will be using Google Forms for students to submit answers to each round. The links to these forms will be released when the round begins. Competitors will need Team IDs and Individual IDs to submit. Answers must be submitted before the announced deadline. MOAA Tournament Organizers reserve the right to cancel any scores submitted after the announced deadline.

For the Team Round and Gunga Bowl, team members should coordinate a method of communication prior to the start of the competition (e.g. Discord, Google Meets). They will still be required to remain in the main Zoom room throughout the rounds. Only one member of each team should submit answers for the Team Round and the Gunga Bowl. If more than one person on any team submits, we will take the lowest score. Teams may not submit more than once for any round on the Gunga Bowl and they may not attempt to submit a previous round once they have access to problems in later rounds. Teams that break any of these rules may be subject to disqualification.

## Discord Hub

Students are able to interact with other participants online using our Discord server:  
<https://discord.gg/f87E8Jt>.

# MOAA Contributors

**Tournament Directors:** Raina Yang, Angeline Zhao, Valencia Zhang, Nate Liang, Andy Xu

**Associate Board:** Jenny Jin (Director of Registration), Anika Mittal (Director of Outreach), David Xie (Webmaster), Anthony Yang (Problem Organizer), Harry Kim (Problem Organizer)

**Faculty Advisor:** Mr. Khiem DoBa

**Invited Speakers:** TBD

**Problem Contributors:** Andy Xu, Anthony Yang, Harry Kim

**Website Programming & Design:** Nate Liang and David Xie

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