

# 26th Bay Area Mathematical Olympiad

March 5, 2025

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## Proctoring Instructions - *Please Read Carefully!*

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### Overview

The proctor is responsible for

- Providing the contestants a quiet place to work.
- Ensuring that students choose the correct exam.
- Assigning identification numbers to the contestants, and entering student data into an Excel spreadsheet.
- Explaining to the contestants how to label their answer papers.  
**NOTE: ALL PAPERS WILL BE UPLOADED (NO MAILING OF PHYSICAL PAPERS). WE ARE USING SPECIAL COVER SHEETS FOR EACH PROBLEM THAT NEED TO BE LABELED CAREFULLY SO THAT THE SCANNED PAPERS WILL BE COMPATIBLE WITH GRADESCOPE, OUR ONLINE GRADING PLATFORM. Students will need to carefully label the title page for each problem that they submit, and also label the continuation pages (if there are any) and only write on one side of the page.**
- Making sure that students don't cheat!
- Collating student answer papers. **PLEASE SORT PAPERS BY PROBLEM! EACH PROBLEM IS GRADED SEPARATELY.**
- **Uploading the Excel spreadsheet with student names and ID numbers and the student answer papers to the grading center as soon as possible! We MUST receive them by Thursday, March 6!**
- Informing your school administrator if you need to ask for an **excused absence** for any students.

See below for more details.

## About the exam; eligibility

We offer two exams: BAMO-8, open to students in grade 8 and below, and BAMO-12, open to all. Collectively, BAMO contains 7 questions, in roughly increasing order of difficulty. BAMO-8 has five questions, labeled A through E, while BAMO-12 has five questions, labeled #1–5. The two exams share three questions, namely C/1, D/2, and E/3.

Each problem is worth 7 points, so the maximum score possible is 35.

BAMO-8 is designed to be easier and is explicitly aimed at younger students. We expect that if an 8th grader is very experienced at contests, he or she might find BAMO-12 more challenging. If a student received a perfect or nearly perfect score in BAMO-8, we may require that this student take BAMO-12 in subsequent years.

Both exams have four-hour time limits. However, some students may want to leave earlier, which is fine.

## What to do before the exam

The exam takes place on **Wednesday, March 5** during a four-hour time block between 12 noon and 9 PM, Pacific Time. For example, 1–5 PM, 12–4 PM, 3–7 PM, etc. Before you administer the exam, you will need to download the exams, the Excel student registration form, and the title pages and continuation pages for your students' solutions:

- Download the **exams** and make as many photocopies as you need. You should have received both the BAMO-8 and BAMO-12 exams in PDF format by email. Each exam is two pages long but can be printed out on a single sheet of paper if your machine allows double-sided printing. The exam PDFs are password-protected. The passwords will be emailed to you on **Tuesday, Mar 4**.
- Download and print out the **Excel student registration form**. You should have received this by email. You should have enough ID numbers to accommodate all the students who will take the test at your site. Each student gets a unique ID number, and an easy way to assign them is by passing out the registration form, having students write their name next to an ID number, and writing down this ID number on a piece of scratch paper. You will fill in more information later on the computer during the exam (see item 2 in “During the Exam”). *Pro tip*: you may want to adjust the format of the form before printing it out so that the rows are taller, making it easier for students to write legibly!
- Download and print out the **title page** for each student's solution. You will need many title pages; it is prudent to photocopy 5 pages for each student, since each student may submit up to 5 problems, and each solution submission *must* have a title page.
- Download and print out the **continuation** pages for each student's solution. This is an optional, but strongly recommended item. If a solution is more than one page long, the remaining pages should be labeled on the bottom of the page indicating which problem it is, what page it is, and the student's ID number. This can also be done using blank paper.

IMPORTANT: THE TITLE PAGE IS CRUCIAL. WE NEED IT TO BE FILLED OUT PROPERLY SO THAT WHEN YOU SCAN STUDENT SOLUTIONS, THE FILE CAN BE READABLE WHEN WE SEND IT TO OUR GRADING PLATFORM, GRADESCOPE.
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- Arrange to have a quiet room for the students to work in, with enough room for them to spread out papers. If you are proctoring students from more than one school, please make arrangements with these students.
- Make sure that you have enough blank, unlined paper for the students: at least a dozen pages per student, possibly much more.
- Let the students know that they may not use calculators or computers. The only items that are allowed are pencils, pens, rulers, compasses, blank paper, the title and continuation pages, and graph paper. In addition, *you are responsible for supplying an adequate supply of blank paper*. Students can use graph paper for investigating problems, but they should not hand in graph paper or lined paper for their solutions (it may not scan well). *We recommend that students use pens or dark pencil, as light pencil marks may not scan well.*

## During the exam

Please follow this procedure.

1. Get the students seated in the exam room, with plenty of space between students, if possible. Make sure that students have only pens, pencils, rulers, compass, five title pages per student, plenty of continuation pages, and plenty of blank, unlined paper and/or graph paper—no other items are allowed. The only exception to this rule is food and drink—the exam is long and students may need nourishment. Likewise, bathroom breaks are permitted (one at a time, of course)!
2. Using the Excel registration form that you have printed out, make sure that each student gets a unique ID number. **Enter the other information requested into the Excel registration form.** Either pass the form to the students and let them fill in their names and other information (writing legibly), and then transcribe this into the Excel file later, or else type the information directly if you already know it. Make sure that the school attended by the student (not necessarily the school where they are taking the exam) and grade level (4–12) is included, and fill in the “bamo8or12” column with the **number 8** or 12, depending on which exam the student is taking. Email addresses are optional, but help us get in touch with students. We will send each student their score by email and also try to contact students who win prizes.

WHEN YOU TRANSCRIBE THE INFORMATION INTO THE EXCEL FILE, PLEASE JUST USE NUMBERS FOR THE STUDENT’S GRADE AND WHICH EXAM THEY ARE TAKING. FOR EXAMPLE, IF A STUDENT IS IN 6TH GRADE AND TAKES BAMO-8, YOU WILL INPUT “6” AND “8”. THIS SAVES US EDITING TIME LATER, THANKS.

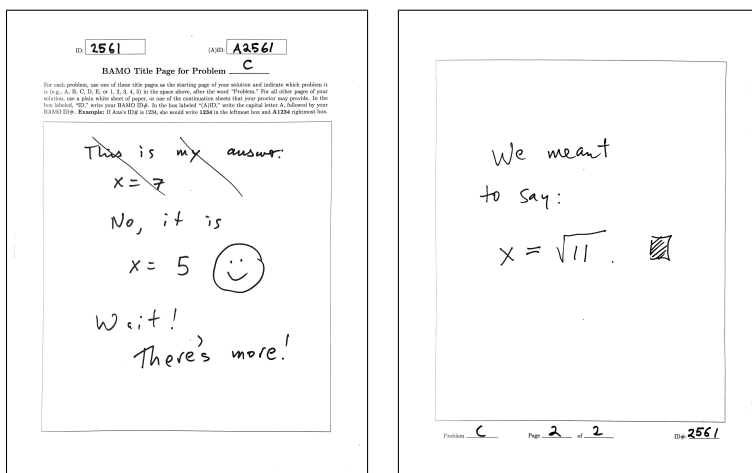
You should have more than enough ID numbers to accommodate all of your students. Each registration form has a minimum of 50 rows. Students can choose any row that they want. It’s fine if you skip lines.

3. Make sure that each student knows their ID number and that you are entering their name in the Excel file with the correct ID number. It is a good idea to keep the printed-out registration form and double check to make sure that what is on it is in your Excel file.

We know that it is annoying to do things twice, but the redundancy of a paper form reduces errors. *If an ID number is incorrectly written by a student and we cannot figure out who wrote the paper, it may not be possible to grade this paper.*

4. Explain to the students that they must *not* write their names on any paper that they hand in. Instead, they must write their ID number *twice* on the title sheet (the second time by putting the letter **A** in front of the ID number). We know that this is weird and annoying, but we have found that this is the best way to coax Gradescope's optical recognition software into recognizing each student's ID number. The student will also write their ID number the bottom of each extra page of their solution.

Here is an example of a title page and second page of a sample solution by a student with ID# 2561, for problem C (on BAMO-8).



Notice that some of the beginning of the problem is crossed out. That's fine. If a student starts work on a title page and decides not to use it, they can just cross out the work, but keep the title page, so that Gradescope can identify them by ID#. Also notice the wide margins; that is very helpful to our hard-working graders!

5. Please read the following statement to the students:

The Bay Area Mathematical Olympiad has five questions. You will have 4 hours to work. Your solutions should be clearly written careful arguments. Merely stating an answer without any justification will receive little credit. On the other hand, a good argument that has a few minor errors may receive substantial credit.

Please use a title page for the first page of any solution that you submit, and use a continuation page for any extra pages. Make sure that the pages are labeled with the problem name or number and your ID#. Write neatly. If your paper cannot be read, it cannot be graded! **Please write only on one side of each sheet of paper.**

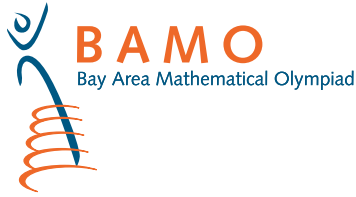
The problems are arranged in roughly increasing order of difficulty. Few, if any, students will solve all the problems; indeed, solving one problem completely is a fine achievement. We hope that you enjoy the experience of thinking deeply about mathematics for a few hours, that you find the exam problems interesting, and that you continue to think about them after the exam is over. Good luck!

6. You may not answer **ANY** math questions during the exam. Well-meaning “clarification” is also prohibited. If there is an emergency (for example, you think the problem statement is wrong) contact us at bamo@msri.org or send a *text* (don’t call; it will automatically go to voicemail) to 415-305-7376. But a good rule of thumb is that if there are two interpretations to a problem, and one leads to a trivial solution or a false statement, then the other interpretation is the correct one. Also assume that we have spent quite a bit of time editing the problems for clarity and correctness.
7. Announce when there are 5 minutes left. Remind students that all sheets of paper that are to be graded must have the identification number and problem number on them. They should *not* include their scratch work; they only need to include what they want the graders to see. Please remind students that quantity and quality are not the same; bombarding the graders with lots of random stuff will not result in anything besides annoyed graders and zero points.

## After the exam

1. Collect the papers, **making sure that all pages are labeled and all problems begin with a properly-labeled title page**. The students are welcome to keep the questions.
2. The exams will be graded by problem, not by student (we will have a team that only grades problem #1, etc.) So **please sort the papers by problem (not by student)** before you scan them.
3. **Scanning:**
  - You will make one PDF file for each problem. So if you have both BAMO-8 and BAMO-12 people, you may create up to 7 files.
  - PLEASE NOTE THAT PROBLEMS C, D, E OF BAMO-8 CORRESPOND TO PROBLEMS 1,2,3, RESPECTIVELY, OF BAMO-12, SO YOU CAN PUT SOLUTION PAPERS FOR PROBLEM C TOGETHER WITH PROBLEM 1, ETC.
  - You can use a scanner or even your phone (the GeniusScan app works rather well on iPhones, as does the scanning utility in the built-in Notes app on the iPhone). Remember that each student’s solution should have a title page; this is crucial so that Gradescope can separate the solutions. Make sure each title page is filled out properly!
  - The student problem solution files must be PDF files. *Don’t just take photos with your phone, though; these will probably be too large to upload.*
  - If a student writes on both sides of a piece of paper (even though you told them not to), do your best to scan both sides. With a phone this is not too hard, but if you are feeding pages into a photocopy machine scanner, you may need to make a copy of the back side of a solution. (Annoying, but you want the entire solution to be read. You can yell at the student later for not following directions.)
  - Remember to scan all the student solutions for a single problem into one file. If, for example, 10 BAMO-8 students do problem C and 4 BAMO-12 students do problem 1, and each student writes a 2-page solution, you will have a total of 28 pages to scan for problem C/1.

- Use this convention for naming files: proctoring site-problem.pdf. For example, if your proctoring site is Mission San Jose HS and your file contains solutions to problem C/1, your file is **MissionSJHS-C1.pdf**. Leave out spaces and weird symbols like / just to keep things simple. If you are only proctoring BAMO-12, your file may read **MissionSJHS-1.pdf**. That's fine. The main thing is that we can keep track of where the files are coming from, since they will be automatically uploaded to a big folder in the cloud.
4. **Uploading:** Go to <https://forms.gle/wntCAyqgwTPJhpMe6> for a google form where you can upload your Excel registration file (make sure it is filled in with the proper ID numbers, and *please do not change the name of the file*) and each of your problem files (you may not need to upload all problems, of course). The problem files must be PDFs, and the Excel file should be a normal Excel file. (If you don't have Excel on your computer, make a google sheet, put the information there, and then download and save in .xlsx format. PLEASE DO NOT MAKE A PDF FILE FOR REGISTRATION.)
  5. You're done, thanks! See you at the awards ceremony!



## 26th Bay Area Mathematical Olympiad

March 5, 2025

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Dear Teacher or School Administrator:

One or more students from your school will be participating the Bay Area Mathematical Olympiad (BAMO) on March 5, 2025.

The Bay Area Mathematical Olympiad (BAMO) is an annual competition, consisting of five essay-proof type math problems to be solved in four hours. One version of the exam is for students in 8<sup>th</sup> grade and under and another version is for students in 12<sup>th</sup> grade and under. The program was founded in 1998 and is currently in its 26th year. Originally restricted to the San Francisco Bay Area, we now include interested students along the west coast.

Over 500 students from dozens of different schools participate in BAMO each year. The contest is proctored at numerous middle schools, high schools, and universities around the Bay Area. Some students have to travel to another school to take the exam, and this has been especially difficult during the pandemic.

**Please excuse your students who will be taking BAMO from classes on Wednesday afternoon, Mar. 5, 2025.** The contest will take place during a four-hour time period between 12 noon and 9 pm, and students may need additional time to travel to the site where they are taking the contest.

Thank you for your cooperation to make this wonderful and unique educational opportunity for our Bay Area students possible.

Sincerely,

A handwritten signature in black ink that reads 'Paul Zeitz'.

Paul Zeitz  
Professor Emeritus, Department of Mathematics and Statistics  
University of San Francisco  
BAMO Organizing Committee  
bamo@msri.org