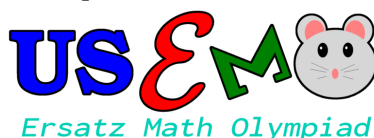


# USEMO Grader Flyer

## UNITED STATES ERSATZ MATH OLYMPIAD

Last updated 29 October 2024



This document gives you a brief sense of what it's like to help with grading for USEMO, to help you decide whether or not you would like to volunteer. In general, the policies of the USEMO are meant to be maximally chill.

### §1 Requirements

The tl;dr is that we are very lax about this. You are invited to help with grading as long as

- you are able to read mathematical proofs,
- you are not eligible to compete (i.e. not a US high school student).

Note in particular that you do NOT need to have math olympiad experience; for example, if you are a math undergraduate who is curious what math olympiads are like, you would certainly be welcome to come join us. Similarly, if you are, say, a math olympiad participant from outside the USA, who wants to get a sense of how USA runs its olympiads, you are welcome to join us as well.

### §2 Timing

The grading takes place in a **3-week period** starting the Monday right after the competition concludes.

Much of the first week is reserved mostly for technical onboarding (getting access to the grading platform) and discussing ideas for marking schemes with your problem captain in Discord. The bulk of the work will happen after the problem captain gives the clear-to-go signal to start entering scores.

We are grateful for however much you are able to contribute. If you have time to read 30 papers, that is helpful. If you have time to read 100 papers, that is even more helpful.

There may be specific times we set out as gathering points, but those are optional.<sup>1</sup> In other words, the director will often say something like, “I will be online from 3pm-5pm ET on so-and-so date, if you are online then, please come by as this is a good time to settle issues in person; but if not, no worries”.

On the other hand, over the course of these 3 weeks, we hope that you can actively monitor messages. We may often need to ask you about a score or comment.

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<sup>1</sup>It wouldn't be possible to have required meetings due to time zones, anyways.

## §3 Platforms

Grading is conducted largely over two platforms:

**Internal Art of Problem Solving grader** The USEMO is hosted by AoPS, and they have a grading interface that will let you input scores and comments for any given student. This is where you will actually download the papers and input the scores.

**Discord** The USEMO runs a Discord to facilitate discussion between the graders. This is where most of the communication will occur.

Since most of the discussion happens on Discord, you will definitely need to create an account and monitor Discord over 3 weeks to grade effectively.

## §4 Grading

You will probably spend most of your time grading one problem. It's more efficient this way, rather than jumping between problems. The organizers will assign you a problem, based on preferences you submit. You can switch if you want, just let us know; the initial assignment is just to make sure the distribution of person-hours is within shouting distance of what is needed.

**Every submission to every problem is read by 2-3 graders** (depending on the problem), and scores must be unanimous before being finalized. That is to say, if the graders input different numbers, then everyone involved has to discuss with each other until they agree. This is why it's so important to check the Discord, so that any discrepancies can be resolved quickly.

Each problem will also have a **problem captain** to settle any difficult cases. The problem captain is also responsible for setting the **rubric** (also known as marking scheme) for the problem. So, most volunteers will not have to worry about this; the rubrics will be provided to you, saying explicitly what kinds of things are worth so-and-so many points. You can check past USEMO reports for examples of previous rubrics.

## §5 Three columns (new for 2024)

The Art of Problem Solving grader has three columns. We're using them differently this year, so please take note:

**First column: for problem captain only.** This year the captain's role is enlarged to not only editing the solution and rubric but also signing off on every individual paper. Hence, you should **only use column 1 if you are problem captain**. Do not enter scores there if you are not the assigned captain for the problem.

**Second column: feedback expected, any grader.** Any grader can enter a score in the second column. However, it's expected the score in this column should contain feedback. As I said, writing feedback to the student is optional; however, if you don't want to write feedback, you should input scores in the third column instead. Suggestions on how to write feedback are included in the next section.

**Third column: feedback optional, any grader.** There are no restrictions on entering a score in the third column.

## §6 Writing feedback (optional!)

A nice part of the USEMO is providing feedback to the students, as this is meant to be a chill learning experience.

**All graders are welcome but not required to provide feedback through the AoPS grader.** During sign-up, graders may also commit to *always write feedback*; this is to make sure every paper has at least one person writing feedback for it, and we take this into account when we make the problem assignments.

We don't want the feedback-writing to be a strenuous task. The amount of detail to put into text feedback can vary. I would say that the rule to follow is: **write anything that comes to mind naturally when grading, but no need to reach for something to say**. There's a lot of 80-20 here. Here are some examples to this end of what I have in mind (but again, it's honestly up to you):

- If the student makes a mathematical mistake in the proof, you can just briefly point it out, and that can be the entire comment.
- If a student submits a completely correct solution that's well-written, you can just say "Great work and well-written" or similar and move on. No need to reach for something to say.
- If the student doesn't solve the problem and makes some progress that isn't enough to be worth partial credit, you can just say "good start" or "nice try" and move on. You're not expected to complete the solution for them – that's called coordination, and it takes foreverrrrr. You also aren't expected to explain why the progress is worth 0 points; we'll be publishing the rubrics later, so the student can just read the rubric.
- Usually if the student doesn't have enough progress on a problem to gain points, they'll know it. Thus **please avoid rubbing this in**. Both "good start" or "nice try" are better than "no progress". Definitely do NOT write something like "your progress is completely trivial and therefore worth no points".

Similarly, if the student makes a conjecture that is false, it's sufficient for one grader to say so; no need to repeat thrice. You can also leave the comments blank, too.

- If the student doesn't solve the problem and makes some progress that is worth a few points, you can just say "good start" and move on. Again, you're not expected to complete the solution for them or justify your decision, since the rubrics will be published later anyways.
- If the student is using  $\zeta$  or  $\Gamma$  for point names you'll almost certainly notice it (and probably laugh), and you can tell them to not do this because it's extremely confusing.
- If the student spent three pages proving the statement of AM-GM before citing AM-GM, you can tell them that they probably didn't need to spend the time writing that, and just say "By AM-GM, ...".
- If the student worked hard to prove something that is actually a well-known named fact, you're welcome to mention it to them, so they can attach a name to in the future, e.g. "by the way, the lemma you proved is actually called Brokard's theorem".

- Some parts of the proof may be very confusingly written. If you spend a lot of time trying to decipher something until you finally figure it out, you can make a short note that so-and-so passage was very confusing, so they know that's the part they should work on. (You don't have to rewrite it for them.)
- If the student makes a joke in the paper, you're welcome to acknowledge it! A lot of the clear-zero papers are quite funny.