Rules changes for EMC 2024

This document is compiled by the Organisational Jury of the European Mathematical Cup for the 13th edition of EMC, which will take place in December 2024. Its main purpose is to explain the rules and the changes in them to local organisers, participants and any other relevant people.

This document uses the following colour scheme to indicate changes and clarifications:

- ~~Old rules~~ - parts that have been removed from the rules;

- New rules - parts that have been added to the rules;

- Comments and clarifications that are not part of the rules, but rather here to clarify why we changed some rules or what was intended by previous rules, particularly in cases where they were not adhered to.

Summary of rules changes

Following the delays in the release of results for the EMC 2023, we decided to change the rules to ensure that the competition flows smoothly and that results are available sooner. Key challenges we identified include the booming growth of EMC, the lack of our own human resources, and the need to frequently assist and remind local organisers.

The lack of our own human resources is highly correlated with the booming growth of the EMC, since this year, there were more than 20 people closely involved with the work of Central Jury, with many more problem authors that submitted their problems to us. This is the biggest Central Jury in the history of the EMC, and we are experiencing a shortage of new volunteers to join and assist. So, even though our Central Jury was bigger than ever, the workload per person was also bigger than ever. Additionally, the Central Jury was composed of many new members, with more than half having no prior experience grading the EMC, as many experienced members have graduated and moved on to professional careers.

On the other end of the spectrum, even though many local organisers are amazing and follow the deadlines, some local organisers consistently create challenges that prolong the work of the Organisational Jury. There were several instances where earlier detection of issues by local organisers could have prevented delays (which among other things, unfortunately, resulted in the need for official results to be recalculated and reuploaded, requiring the Organisational Jury to hold an emergency meeting and work overnight to mitigate the issue).

So, we rewrote parts of the rules to reflect these two changes:

- **Fully local grading** - even though old rules allowed smaller local organisers to send us the scans of students' scripts and we would grade them, this is unfortunately no longer feasible. With more than 40 local organisers and 400 students in each category during the EMC 2023, we can no longer offer central grading. There are only so many of us, and the interest in the EMC is still growing (with several big local organisers expected to join for the 2024 edition), it is unfortunately necessary to discontinue central grading to accommodate future growth. If the Central Jury only needs to review 100 marked tests, it will be done much quicker than marking 500 unmarked tests.

- **Stricter deadlines** - to ensure the Juries can fulfil their responsibilities. Organisational Jury is composed of just a few volunteers who work as much as they can to ensure everything runs smoothly in communication between local organisers and the Central Jury, but there are way too many participants and local organisers to make sure we don't make mistakes. Similarly, the Central Jury is also composed of volunteers, aldo much more, and it is impossible to ask them to work for months to make sure that once we finally get the scans and translations, they can review them. We are mostly students like many others in the world, and we also need some time to focus on our degrees and exams and already have other projects running.

By shifting more responsibilities to local organisers, we aim to make the whole process smoother going forward.

Rules

1   General

The European Mathematical Cup (abbr. EMC) is held every year in December ~~in cities all over (but not limited to) Europe~~ globally. The EMC is an open competition. Therefore, students from non-European countries may participate in the competition as well, provided they have a local organiser under whom they can participate.. We gladly welcome local organisers from outside Europe, as illustrated here.

The purpose of the EMC is to prepare high school students for other international competitions and to give them a chance to solve a few, hopefully, nice and challenging problems.

The competition takes place in December, during a 9-day interval which is chosen by the EMC Jury. The competition can be organised on any day of the 9-day interval. The exact date varies by location and is usually chosen to be the most suitable within the given time frame. Local organisers have complete autonomy to select any date within the 9-day interval. The interval typically spans from Saturday to Sunday, ensuring coverage of two weekends.

The EMC is free and open to all high school students. Any attempt to charge the students for participation in the competition is strongly prohibited and will result in disqualification and a loss of the local organiser status for future editions.

The competition is organised by Young Gifted Mathematicians, a nonprofit volunteer organisation, which runs the competition at no cost. All our work; authoring and selecting the problems, making marking schemes, marking and ensuring uniformity of marking... is done by volunteers. Since we are not charging participation to local organisers, we expect them to make the competition free for their participants. Therefore, any local organiser found to be charging participation fees will be permanently banned from future editions. Additionally, the EMC is also open to all high school students, we expect local organisers to make every effort to admit all students wishing to participate, without bias toward their academic background (e.g., previous competition results).

2   Participation

The European Mathematical Cup is organised by the association Young Gifted Mathematicians "Marin Getaldić" from Croatia, in coordination with local organisers responsible for overseeing the competition at their respective locations. Requirements for local organisers are described in Section 3.

~~Any number of contestants from a single location is allowed to participate, but the following limitations exist:~~

- ~~A local organisation can have more than 10 contestants per category if they mark the solutions of the surplus of contestants themselves, according to the rules set in Section 3.~~ As of 2024, all contestants must be marked by local organisers.

- ~~The maximum number of contestants from a single country that can be included in the Official Results list is 20 per category. The surplus of the contestants will be listed only in the Local Results list.~~ This rule is moved to section 7 in the revised version of the rules.

Contestants are eligible to participate in the EMC if they are eligible for the ~~next year's~~ following IMO. Slight rewording here since there have been some questions about it. For example, for EMC 2024 (in December of 2024), it is the students who can participate in IMO 2025.

The EMC is divided into two categories: Junior and Senior.

- A student can participate in the Junior category if they are less than 17 years old on the day of writing the contest, and if they haven't yet participated in the IMO.

- Any student who is eligible to participate in the EMC can participate in the Senior Category.

- Local organisers may set ~~additional criteria for students to participate in the Junior category, in agreement with the Central Jury.~~ different criteria for student participation in the Junior category, subject to approval by the Organisational Jury no later than December 1st.

3   Local organisers

Local organisers are the people or organisations organising the EMC in their city or country. Typically, local organisers are university students or mathematics professors.

The call for local organisers will be published on the official website of the competition at least a month before the deadline for registration. If you are applying to be a local organiser for the first time, you are required to provide background information to confirm your suitability for the role of the local organiser (e.g., previous experience organising international competitions, membership in a relevant association, teaching credentials, or links to an institutional website). Then, you should fill out the form we will send before the deadline. This deadline is usually 1st of December or later. If you miss the deadline, you will not be able to serve as a local organiser.

Their obligations are the following:

- Before the contest, they should inform all the potential contestants about the competition and its regulations. They should choose where and when the contest will be held and make the necessary arrangements. Their information will also be published on the official webpage so potential contestants can reach them.

- To organise the contest. We request that all local organisers hold the competition in person, where feasible. If the contest is being held live (usually in a classroom in a local school or university) they distribute the problem sheets to contestants (translated into their language if necessary). If the contest is not being held live, the contest should be held via a video call; all of the contestants must be on the same call as the local organiser and their desks should be clearly visible (local organisers can ask that it is recorded with multiple cameras and we strongly advise; e.g. both using your laptop webcam and your phone to record your laptop screen). The organisers should send the (translated, if necessary) problems to the contestants via e-mail a few minutes before the competition starts. The contestants should then print the problems. If they do not have a printer, they should copy the problems on a piece of paper. The use of any communication devices (e.g., phones, laptops, smartwatches) during the competition is strictly prohibited and will result in immediate disqualification. If the contest cannot be held either live or via a video call, the local organiser must contact us and suggest an alternative way to hold the competition. We expect local organisers to ensure contestants adhere to the rules.

- After the contest, the local organisers should collect contestants' solutions or scans and send them to the EMC Jury. We ask them to attach the translations of those parts of the contestants' work they consider might be worth marks. The translations should be in English ~~or Croatian language~~ and Latin script; all parts of students' work which are not translated in this fashion will **not** be marked.

- ~~We expect to receive the scripts, which are to be marked by the Central Jury, no later than 5 days after the last day of the competition.~~

- For local organisers and any help they bring to ensure marking can be done in a timely manner ~~who decide to mark all or part of their students' work~~, we will provide detailed marking schemes of all solutions known to the Central Jury. Marking schemes will be sent as soon as possible after the last day of the competition. We expect to receive scans of locally marked scripts, along with the completed marking and translations of any sections where points were awarded no later ~~than 14 days after the last day of the competition~~ than the date determined by the Organisational Jury, which will be sent to local organisers along with the marking schemes, that will be at least 14 days after they receive the marking schemes. We ask that all parts of the students' work which were awarded marks are translated, so the Central Jury can ensure the uniformity of the marking. ~~We encourage the local organisers to mark the problems themselves to make the coordination process easier and faster.~~

So, after the deadline that will be sent with the marking schemes, we expect to have all the translated tests and marks for all students.

To save local organisers (and the Central Jury that will review them) some time, we strongly encourage local markers to annotate translations and points awarded using different colours (e.g. a red pen) directly on the tests next to the part of the script they refer to (and then scan and send them to us).

Furthermore, local organisers will receive a Google Sheets spreadsheet that they need to fill out with information about students and marking. Marking in that spreadsheet on the deadline is considered final unless you let us know you are done before it.

If any part is missing (e.g., translations for some students, marking for specific problems), the missing section will automatically receive 0 points (even though local markers might award some points in the marking spreadsheet).

Additionally, we invite local organisers to help us by proposing problems. We intend that all of the problems at the EMC are original (not already seen on the Internet or some other competition), so we invite local organisers to send us problem proposals. The problems not selected for the competition are kept confidential forever. Thus, even if your problem is not selected, you may submit it to another competition. It is allowed to propose problems which are not entirely original, but in such cases, we require the full background of such a problem, including whether it has appeared in another competition.

Additionally, we also invite local organisers to participate in the selection process or central grading of the problems to ensure the whole process runs smoothly and fast.

4   Contest regulations

The contest regulations closely follow those of the IMO.

Contestants may receive the problems in one or two languages, as determined by the local organisers.

Each contestant must work independently and submit their solutions either in their native language or in English, as specified by the local organisers. The duration of the competition for both categories is 4 hours. The contest consists of 4 problems. Each problem is worth 10 points. We ask contestants to write only on one side of a plain A4 paper. This ensures the readability of scans, so please follow this request. It is not allowed to write attempts at different problems on the same sheet. Each paper should contain the student's name, location, category and the number of the problem. If the contestant used more than one page per problem, the pages should be enumerated.

Only writing and drawing instruments, such as rulers and compasses, are permitted during the contest. Specifically, the use of books (with the exception of dictionaries for those writing in English), papers containing formulas, cheat sheets, tables, calculators, protractors, computers, or any communication devices is strictly prohibited.

Local organisers must ensure that no contestant has access to any direct or indirect information regarding the proposed problems. They must also ensure that all contest problems and solutions are kept strictly confidential until after the entire contest has finished. The exact date will be indicated on the problem sheets, typically the Monday following the final competition day.

5   Coordination

The old version of this paragraph was called "6. Coordination and results", and section 5 was missing due to an older rules change.

For each problem, a contestant will receive an integer score out of a maximum of ten points.

Local grading will be reviewed by the Central Jury to ensure consistency and uniformity. The Central Jury will review the scripts of participants who scored the highest, as well as a random selection of others; however, not all scripts will be reviewed by default. Should the Central Jury identify minor discrepancies in the reviewed sample, the local scores will be adjusted accordingly.

In cases where significant discrepancies are identified between local grading and the Central Jury's evaluation, the Central Jury may re-examine all or most scripts. The local organiser responsible for those participants will lose the right to host the competition for at least one edition.

If the Central Jury determines that any part of the requested materials (e.g., translated scans on Google Drive or local marking scores in the Google Sheets spreadsheet) is missing after the deadline, the corresponding scores will be automatically set to 0. Only the official marking spreadsheet will be accepted for submitting scores.

If a significant portion of the required materials is missing, the local organiser will lose the right to host the competition for at least one edition, and all missing components will receive 0 points.

Scripts marked with 0 points due to missing translations or incomplete marking in the official spreadsheet will remain at 0 points for the temporary results. If the issue is easily resolvable (e.g., a local organiser omitted to upload a few scripts or a single problem), an appeal can be submitted even before receiving temporary results once they fixed the issue.

Mistakes happen. Both on our end and with local organisers. However, instances such as submitting a Word file with total participant scores without individual problem breakdowns, or sending unorganised zip files of test images (in April, long after the January deadline), *both of which happened during the EMC 2023*, will no longer be accepted. This is our final measure to ensure that results are processed in a timely manner and not delayed.

6 Temporary results and appeals

As soon as possible after the contest, once the Central Jury has ensured the marking is consistent with the rest of the results, local organisers will receive temporary results. Upon announcement of these results, a contestant may submit an appeal **through their local organiser**. In previous editions, many appeals were sent directly to the Central Jury. However, from now on, only appeals submitted through local organisers will be reviewed by the Central Jury. If the local organiser agrees with the contestant's objection, they may forward the appeal to the EMC Jury no later than the deadline provided along with the preliminary results, which will be at least 7 days after receiving temporary results. The EMC Jury will then reassess the contestant's solution and may contact the local organiser or contestant for further clarification if needed.

Once the objection review process is concluded, the preliminary results become final. These results will be published on the official EMC website and sent to local organisers ~~no later than two weeks after the preliminary results have been issued~~ as soon as all appeals have been reviewed which typically takes less than a week after the appeal deadline.

7 Prizes, medals, and certificates

Some contestants are awarded prizes and medals based on the following criteria. We say a contestant is a candidate if there are no more than 5 students from the same country and category with more points. Then, for each category separately, we form a list with 6 of the best candidates from each country (we will call this a cut-list). The idea behind this is to give every country the same weight: 6 students as in IMO. We then set the prize cut-offs so that approximately half of the candidates from the cut-list win a prize, and the numbers of first, second and third prizes are approximately in the ratio 1:2:3. ~~The top 3 candidates from each category are also awarded medals (via post).~~ The top-performing participants are awarded medals and other prizes.

Contestants who do not qualify as candidates but rank among the top 20 in their country will appear on the Official Results list and receive any prize they are eligible for. ~~All of the contestants are listed in the Local Results list.~~ At the discretion of the Organisational Jury, partial results may be published, excluding participants who scored below a certain threshold. Every contestant may request a certificate of participation or any awards they have earned directly from us, although certificates will be automatically generated and sent to local organisers as soon as possible following the release of final results.

A country's score is defined, for each category separately, as the sum of scores of candidates from the cut-list. This means the top six participants' scores are used. ~~A country's total score is then the sum of the country's scores in the two categories.~~ This score is used to form country results and to award the title of "European Champion". This title is purely symbolic and has no bearing on the competition.

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