AFRICAN MATHEMATICAL UNION

Web site: <https://africamathunion.org/AMU-pamo-official.php>

31st Pan African Mathematics Olympiad (PAMO 2024) Regulations

Date: 10 to 20 August 2024  
Venue: University of the Witwatersrand  
Johannesburg, South Africa

**Online Participation at PAMO 2024 (please see attached file)**

1. **Preamble:**
   1. The African Mathematical Union Commission on the Pan African Mathematics Olympiads (AMUPAMOC) has published new PAMO regulations, applicable from January 1, 2001. These regulations cover matters that do not change from year to year, excepted if necessary.
   2. If a host country wishes to vary any of them, the Local Organizing Committee (LOC) must obtain the agreement of the AMUPAMOC beforehand.
   3. In addition to these permanent regulations, each year the AMUPAMOC, in consultation with the LOC of the current PAMO, will make procedures relating to:
      1. The place and dates of the current edition.
      2. The date by which official acceptance of the invitation to participate must be received.
      3. The date by which participating countries must send information about team leaders and team members.
      4. The date by which problems proposed for the competition must be received by
      5. The official program of the Olympiad.
   4. The 31st Pan African Mathematical Olympiad PAMO (incorporating the Pan African Mathematical Olympiad for Girls PAMOG) will take place at **The University of the Witwatersrand, Johannesburg from August 10th to August 20th 2024**
   5. The official languages of PAMO/PAMOG are French and English.
   6. During the past working session of the Jury of PAMO 2003, the members discussed the ranking by country and agreed that for future editions of PAMO the ranking by country should be determined by the total number of points of all the members of the team, even if the team consists of fewer than the allowed number of members.
2. **Participation in PAMO 2024**
   1. Participation at PAMO/PAMOG is by invite only. Countries wishing to be invited should send an email of intent to the LOC and AMUPAMOC.
   2. The AMU-PAMOC and the LOC will send invitations to interested countries. All invited countries must send an official acceptance, which must be received on or before**, 24 May 2024** to:
      * Prof Nouzha El Yacoubi, President of AMUPAMOC at [nelyacoubi4@gmail.com](mailto:nelyacoubi4@gmail.com), **and**
      * Dr Jonathan Kariv, PAMO 2024 LOC Chairperson at [Jonathan.Kariv@wits.ac.za](mailto:Jonathan.Kariv@wits.ac.za)
   3. During registration, countries will indicate one of the 3 following options:
      1. attending in person;
      2. attending online;
      3. will confirm attendance option by **7 June 2024**, the strict deadline.
   4. The official acceptance letter should include the total number of the persons in the delegation as well as their designation (leader, deputy, official contestant…).
   5. The registration to PAMO 2024 should be done through the official PAMO 2024 Website by **1st July 2024** <https://pamo24.ms.wits.ac.za/>.
3. **Teams**
   1. Each country is entitled to send, to the host country, a team consisting of a Team Leader, a Deputy Leader, and at most six (6) official pupils (at most 3 boys and at most 3 girls).
   2. Each country may also send at most six (6) unofficial contestants (at most 3 boys & at most 3 girls), and any number of observers subject to the fees laid out in 4.2.2.
   3. The team leader must be a mathematics teacher at the secondary or tertiary level or have significant mathematics background, such as being a university student with multiple olympiad participations (these cases should be approved by the LOC).
   4. Each contestant must be less than twenty (20) years old on the day of the second examination paper.
   5. Contestants must not be permanently enrolled in any post-secondary institution on 1 January 2024.
   6. Each participating country must provide their contact details: postal address, phone number and email address.
   7. Each participating country must provide, on or before**, 15 July 2024**, the list of its team members and observers to both the LOC Chair and AMUPAMOC President. However, for purposes of obtaining visas it is recommended that countries send this information through far earlier.
   8. The team leader of each participating country must be assisted by a deputy leader to supervise the welfare of the team. The deputy leader may not attend the working sessions of the Jury. **If a country does not send a deputy leader, then the team leader has to leave the Jury and fill the deputy duties**.
4. **The responsibility of the host and the participating countries**
   1. The responsibility of the host country:
      1. The host country covers accommodation, meals and local transport costs of:
         1. The team leader, the deputy leader and the official team candidates of each participating country.
         2. The representatives of the African Mathematical Union, in particular the President of AMU, the President of the AMUPAMOC and the Mediator of PAMO/PAMOG 2024.
         3. The Mathematics Olympiads specialists invited by the AMUPAMOC in agreement with the LOC.
      2. The host country covers the travel costs of:
         1. The Chairman of the Jury for PAMO (the President of AMUPAMOC).
         2. The Chairman of the Problems Committee (the Mediator).
         3. Two International invited specialists of IMO as members of the Problems Committee.
         4. Two African invited specialists from PAMO and/or IMO.
      3. The host country takes care of all the Olympiad necessities and appreciation honorarium (VISA fees if applicable, vaccination fees, COVID tests, transit flights…), gifts or souvenirs to officers.
      4. The host country takes care of all the Olympiad material and logistic necessities; it awards medals, prizes and certificates of participation.
   2. The responsibility of the participating countries:
      1. Participating countries are responsible for all the travel costs of their delegation to and from the host country, as well as **the medical coverage** of their team.
      2. Participating countries are responsible for the fees payable, denoted as follows in Euros/Dollars:
         1. Observer A (observer with Team Leaders): 700 Euros
         2. Observer B (observer with Deputy Leaders): 450 Euros
         3. Observer C (observer with contestants): 450 Euros for a shared room.
         4. Unofficial contestants for in-person countries: 450 Euros for a shared room.
         5. Unofficial contestants for remote countries: 50 Euros each for the first three boys and first three girls.
      3. The fees charged to observers and unofficial contestants must be transferred to the LOC's bank account or upon arrival on site.
5. **The Mediator**
   1. The AMUPAMOC appoints for each PAMO and for the term of one year a Mediator, who must be an African mathematician who is a prominent member of the AMU and has good experience with PAMO.
   2. The appointed Mediator for PAMO 2024 is **Dr. Karam Aloui**, AMUPAMOC Executive Secretary.
   3. The Mediator must be fluent in both official languages of PAMO: English and French
   4. The Mediator is required to:
      1. Collect a database of Mathematics Olympiads Problems and to make it available to the Problems Committee (see 6).
      2. Participate in the various working meetings.
      3. Provide mediation before and during the coordination process, in case of disputes between team leaders and coordinators.
6. **Mathematical Problems for PAMO 2024**
   1. Submission of problems:
      1. Every member of AMUPAMOC is required to propose at least three problems each of 1 hour 30 minutes duration **with solutions** for the Olympiad.
      2. Each country taking part in the Olympiad is required to submit at least three problems of 1 hour 30 minutes duration **with solutions** for the Olympiad.
      3. Each problem submission must contain **two separate** files: one with **only the problem statement**, and another with the problems statement **with solution**.
   2. The problems must cover, as far as possible, different areas of Algebra, Geometry, Combinatorics, and Number theory and should be of different levels of difficulty. The problems must be submitted in English or in French.
   3. The problems must be sent to the PAMO 2024 Mediator, Dr. Karam Aloui at [alouikaram@yahoo.fr](mailto:alouikaram@yahoo.fr), with a copy to the AMUPAMOC President, Prof Nouzha El Yacoubi, before **1st July 2024**. Problems submitted after the deadline will not be accepted.
   4. The problems should be original. That is they should not have appeared in any other competitions, training materials, textbooks or school/university exams.

## **IMPORTANT: Submission of PAMO Proposed Problems is an obligation for each team leader participating in PAMO 2024. There will be a fine of 20 Euros per problem not submitted (of the expected three). That is 60 Euros if no problems are submitted, 40 euros if only 1 problem is submitted and 20 euros if two problems are submitted. This fine may be waived for new countries, but this must first be confirmed with the PAMO Commission.**

1. **PAMO 2024 Problems Committee**
   1. The Problems Committee of the PAMO 2024 will include:
      1. As Chairman: The Mediator of PAMO 2024
      2. As members:
         1. The PAMO 2024 LOC Chairperson or a colleague from the host country appointed to replace them
         2. Two invited international specialists of IMO as members of the PAMO 2024 Problems Committee
         3. One invited African specialist of PAMO and/or IMO as member of the PAMO 2024 Problems Committee
   2. The Problems Committee members will meet online starting from **15 July**, in order to work on the Problems proposals received before the deadline. They will meet in person on **10 August**, in Johannesburg, to recommend the long list of 20 to 24 problems to the Jury, which will cover, as far as possible, the different areas of Algebra, Combinatorics, Geometry, and Number Theory.
2. **The Jury**
   1. The Jury is composed of the AMUPAMOC President, the PAMO 2024 LOC Chairperson or a colleague from the host country appointed to replace them, the PAMO 2024 Mediator, the member(s) of the AMUPAMOC from the host country (if applicable), and the team leaders of the participating countries.
   2. The invited specialists and the observers A may attend the Jury but do not have the right to vote.
   3. The Jury is chaired by the AMUPAMOC President.
   4. Each team leader must be proficient in one of the two official languages of PAMO, English and French, and must be able to translate the selected problems into the official language of his or her team.
   5. The Jury has the responsibility to select 12 problems (short list) from the long list recommended by the Problems Committee.
3. **The Supervising Committee**
   1. The Supervising Committee is composed of the AMUPAMOC President, the PAMO 2024 Mediator, and the PAMO LOC Chairperson or a colleague from the host country appointed to replace her/him and who shouldn’t be the team leader of the host country. Some members of the PAMO 2024 Problems Committee could be invited to assist.
   2. For PAMO 2024, these are:
      1. AMUPAMOC President: Prof Nouzha El Yacoubi or a colleague recommended by her
      2. PAMO 2024 Mediator: Dr Karam Aloui or a colleague recommended by him
      3. PAMO 2024 LOC Chairperson: Dr Jonathan Kariv or a colleague from the host country appointed to replace him
   3. The Supervising Committee has the responsibility of choosing 6 problems from the 12 selected by the Jury for the current Olympiad.
   4. The Supervising Committee has responsibility for setting the question papers and resolving any problems of coordination.
4. **Marking and Coordination**
   1. The AMUPAMOC in agreement with the PAMO 2024 LOC will appoint a team of six Problem Captains and other coordinators who will meet with the Jury when the final selection of six problems has been made and the marking schemes are drawn up.
   2. Each problem will be awarded a mark (a whole number between 0 and 7 inclusive) in the following manner:
      1. The solutions of the contestants will initially be assessed by their team leader.
      2. The team leader will present the solutions of the contestants to a coordinator, and a final score for each question will be agreed upon in accordance with the marking scheme.
      3. The scores will be recorded on an official form and signed by the team leader and the coordinator.
   3. If the team leader and the coordinator fail to agree on a score for a contestant, the matter will be referred to the Problem Captain.
   4. If the team leader and the Problem Captain fail to agree on a score for a contestant, the matter will be referred to the Supervising Committee whose decision shall be final.
   5. No country’s scripts should be marked by coordinators from that country, except for cases where it is unavoidable.
5. **Prizes**
   1. The host country awards medals, prizes and certificates of participation
   2. Medals
      1. Medals for PAMO contestants: Gold Medals, Silver Medals and Bronze Medals will be awarded in approximately the ratio 1:2:3; the exact total point thresholds for each kind of medal will be decided by the Jury. The total number of medals awarded will not be more than half of the number of official contestants.
      2. Medals for PAMOG contestants: Gold Medals, Silver Medals and Bronze Medals will be awarded in approximately the ratio 1:2:3; the exact total point thresholds for each kind of medal will be decided by the Jury. The total number of medals awarded will not be more than half of the number of official contestants.
      3. The top ranking femalecontestant by total number of points will be crowned “African Mathematics Queen 2024”
      4. Medals for countries: Countries will be ranked by taking the sum of the total scores of all their team members. The team leaders of the top three countries will be awarded Gold, Silver and Bronze Medals.
   3. Special prizes may be awarded for solutions considered outstanding by the Jury.
   4. Each contestant who has not won a medal will receive a certificate of Honourable Mention if he or she has scored full marks (7) for at least one problem.
   5. The host country must provide certificates of participation for all the contestants who took part in the Olympiad, and special certificates for the winners of Gold, Silver or Bronze Medals, Honourable Mentions, and special prizes.
   6. All the certificates should be co-signed by the AMUPAMOC President and PAMO 2024 LOC Chairperson.
6. **Gifts**
   1. Each participating country is encouraged to bring gifts of a cultural nature to be exchanged with participants from other countries.
7. **Scientific syllabus of PAMO**
   1. There is no official mathematical syllabus. The problems must cover, as far as possible, different areas of interest of pre-university education, in particular Algebra, Geometry, Number Theory, and Combinatorics.
   2. Problems must be original. Students must be able to solve them only with basic arguments without referring to sophisticated theoretical knowledge.
8. **Deadlines**
   1. **24 May 2024**: Deadline of confirmation of participation in PAMO 2024, which must be received by the AMUPAMOC President and the PAMO 2024 LOC Chairperson.
   2. **1 July 2024**: Deadline of receipt of the list of the team members and observers by PAMO 2024 LOC Chairperson with a copy to the AMUPAMOC Executive Secretary. Deadline for confirmation of online or in-person attendance.
   3. **1 July 2024**: Deadline of receipt of the problems proposals for PAMO 2024 by the PAMO 2024 Mediator **with a copy to the AMUPAMOC President**.
   4. **15 July 2024**: Deadline of sending the flight schedules to the LOC Chairperson with a copy to the AMUPAMOC Executive Secretary.
9. **Opening and Closing Ceremonies**
   1. The Opening Ceremony should include the following elements:
      1. Speeches by AMU officials, government officials, local organisers, and/or sponsors
      2. The oath by contestants and team leaders to adhere to the rules of the PAMO
      3. The parade of countries
      4. Official declaration of opening of the PAMO 2024
   2. The Closing Ceremony should include the following elements:
      1. Speeches by AMU officials, government officials, local organisers, and/or sponsors
      2. The report by the chief invigilator
      3. Awarding of medals to the winnings contestants
      4. Awarding of trophies to the top 3 countries
      5. Handing over of the PAMO flag to the host country for PAMO 2025
10. **PAMO/PAMOG 2024 Agenda**

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| **Date** | **Contestants & Deputies** | **Leaders & PSC** |
| Sat, Aug 10 |  | PSC Arrive |
| Sun, Aug 11 |  | Leaders Arrive |
| Mon, Aug 12 |  | Jury Meeting |
| Tue, Aug 13 | Arrival | Jury Meeting |
| Wed, Aug 14 | Opening Ceremony | Jury Meeting Opening Ceremony |
| Thu, Aug 15 | Paper 1 | Marking Schemes Small excursion |
| Fri, Aug 16 | Paper 2 | Marking Schemes Coordination |
| Sat, Aug 17 | Excursion | Coordination |
| Sun, Aug 18 | Excursion | Coordination Jury Meeting |
| Mon, Aug 19 | Closing Ceremony | Jury Meeting Closing Ceremony |
| Tue, Aug 20 | Departure | Departure |