

USAMO 2004 Teacher Manual



I. THE USAMO – GENERAL INFORMATION

The 2004 USA Mathematical Olympiad (USAMO) is to be given in your school, and is scheduled for Tuesday & Wednesday, **April 27 & 28, 2004.**

U. S. citizens and students legally residing in the United States (with qualifying scores) are eligible to take the USAMO.

The format for the USAMO will be identical to the format used for the International Mathematical Olympiad. The Olympiad will consist of six essay-proof questions to be solved over two days in nine hours, three questions for 4.5 hours on Tuesday, and three questions for 4.5 hours on Wednesday.

The top 12 scoring students on the USAMO will be invited to attend an award ceremony held in Washington, D.C., June 20-21, 2004. The USA International Mathematical Olympiad (IMO) Team will be chosen at the Mathematical Olympiad Summer Program (MOSP, June 13-July 3, 2004) after further testing

Arrangements will be made by the Canadian Mathematical Olympiad Committee for some Canadian students to unofficially take the USAMO.



It is recommended that students selected for the USAMO practice on prior year examinations. For your convenience a USAMO Publication Order Form S-IV (page 15) is found in the student section of this manual, .

The selection of the USAMO participants will be made on or before Monday, April 12. All selected students and their School Manager will receive a letter of invitation, to be mailed out during the week of April 12-16, or before. Please do not inquire about the USAMO invitations with anyone except the AMC Director, and do not phone prior to Thursday, April 15.

The USAMO must be taken on the official days under the supervision of a certified professional educator--absolutely no exceptions. It is possible, however, for a student to take the test under the supervision of a teacher at a site other than the student's school for valid reasons. The student's teacher must call the AMC national office for permission.

Selection for the USAMO will be made according to the following rules:

1. The goal is to select about 250 of the top scorers from the prior AIME and AMC 12A, AMC 12B, AMC 10A and AMC 10B contests to participate in the USAMO.
2. Selection will be based on the USAMO index which is defined as 10 times the student's AIME score plus the student's score on the AMC 12 or the AMC 10.
3. The first selection will be the approximately 160 highest USAMO indices of students taking the AMC 12A or AMC 12B contest.
4. The lowest AIME score among those 160 first selected will determine a floor value. The second selection of USAMO participants will be from the highest USAMO indices among students who took the AMC 10A or AMC 10B and the AIME, and received an AIME score at least as high as the floor value.
5. The student with the highest USAMO index from each state, territory, or U.S. possession not already represented in the selection of the first and second groups will be invited to take the USAMO.
6. To adjust for variations in contest difficulty, the number of students selected from A & B contests will be proportional to the number of students who took the (A & B) Contests.
7. The selection process is designed to favor students who take the more mathematically comprehensive AMC 12A and AMC 12B contests.

In advising students who desire to be selected for the USAMO whether to take the AMC 12 level contests or the AMC 10 level contests, it will be to their advantage to take the AMC 12 level contests.

II. PRELIMINARY INFORMATION FOR THE PROCTOR

The USAMO Committee has a very tight schedule. We grade the papers on April 30, May 1 and 2, posting results on May 5 2004. Your help is vital.

The USAMO is to be given on Tuesday, April 27 and Wednesday, April 28, 2004, in two 4.5-hour sessions. The first session (Problems 1, 2, 3) is scheduled for Tuesday, April 27 and will begin at 12:30 p.m. EDT and end at 5:00 p.m. EDT or equiva-

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III. INFORMATION FOR THE 2 DAYS OF THE USAMO

Please note this year's USAMO 2 day format:

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and the 4.5 hour length both days, given at the following times:

12:30-5:00 p.m., Eastern Daylight Time

11:30-4:00 p.m., Central Daylight Time

10:30-3:00 p.m., Mountain Daylight Time

9:30-2:00 p.m., Pacific Daylight Time

The USAMO will be posted on the web 15 minutes prior to the start time. Please tell students to stay within the borders when writing their solutions and to write **darkly** so the faxed copy can be clearly read. If requested, you may let the participant have unmarked scratch paper. If, for any reason, the student submits scratch paper instead of, or in addition to, an answer form, the Problem Number and the Student Number, but NOT the student's name or school, must be on each page submitted. All papers must be anonymous at the time of the grading. You are not permitted to answer any questions about the test and should ensure that no participant has the opportunity to talk to any other student while the exam is in progress. No notes, books, headphones, slide rules, mathematical tables, calculators or calculator watches are allowed during the exam. The only instruments permitted are writing and drawing instruments (ruler, compass, protractor, graph paper, carbon paper). Recent eligible immigrants who are taking the USAMO for the first time are permitted to use a non-technical translation dictionary during the exam. However, you must examine and keep the dictionary in your possession for the 24 hours preceding the USAMO, and you must announce to any other participants that the student has been given special permission to use the dictionary. Please list the name(s) of any student planning to use a non-technical translation dictionary on page T-II.

Neither the problems nor the student's solutions should be machine copied. **The USAMO is copyrighted.**

Instruct the participant to cease writing at the end of each exam session. Session I ends at 5:00 p.m. EDT (or equivalent in your

lent in your time zone. The second session (Problems 4, 5, 6) is scheduled for Wednesday, April 28 and will begin at 12:30 p.m. EDT and end at 5:00 p.m. EDT or equivalent in your time zone. The 9-hour time limit is to be strictly enforced. Students should come prepared with a sack lunch and/or snacks due to no lunch break during the exam (Exceptions will be made for restroom breaks). Be sure that in the room you reserve for the exam, the student(s) will have ample working space and freedom from interruptions. *The student(s) must be under supervision during the entire course of the exam and only one student at a time may leave for restroom breaks.* If you have more than one student who qualified, be certain there is adequate space between them.

You will find the following materials included in your AIME/USAMO Teachers Manual or on our website at www.unl.edu/amc :

1. T-II – 2004 USAMO ACKNOWLEDGEMENT RESPONSE FORM (page 5)

Comment: This Form and the S-III – Student/Parent Response Form (page 13) must be returned to the AMC Office so that it is received by April 21. We suggest Faxing 303/374-6339 if at all possible (Emergency Fax # 402/472-6087). All information requested on these forms must be provided by you, the student and his/her parents. Missing or incorrect information could cause disqualification of your student(s).

2. Copy (for your information) of the "S-I – Letter to USAMO Qualifier" (page 11), "S-II – Instructions to be Read by USAMO Participants" (page 12) and "S-III Student/Parent Response Form" (page 13).
3. Follow these instructions to download the 2004 USAMO from the internet:
 - a. Use a computer to visit the Web. We have a trial page in place, so you can check your ability to download the exam.
 - b. Log on to our web page <<http://www.unl.edu/amc>>
 - c. On our home page under the heading **What's New** <<http://www.unl.edu/amc/>> there will be a link to the USAMO Questions page. There will also be a link from the USAMO page
4. T-III – USAMO Certification Forms (pages 7 & 9) . There are two forms, one to be used each day of the Contest.
5. S-IV – Publications Order Form (page 15)
6. USAMO Answer Sheets Forms (to be copied, 1 set for each student) (in section IX, starting on page 17, but unnumbered).

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time zone) on April 27, 2004 and session 2 ends at 5:00 p.m. EDT (or equivalent in your time zone) on April 28, 2004. At the end of each session instruct your students to double-check that the student number on their answer forms matches the number assigned in the official invitation letter. Next, immediately Fax (303/374-6339) the papers to the AMC Office. Send one complete fax transmission per student, with appropriate accompanying T-III form. Please fax at least one official USAMO answer sheet with student number for each problem, even if the answer sheet is blank because the student did not attempt a solution. This assures that we have received all problems from all students.

If you have any questions concerning this exam, you may call or Fax:

AMC Office
1-800-527-3690
FAX 303/374-6339
(Emergency FAX # 402/472-6087)

IV. CANCELLATION

If for some reason the student or school cancels participation, call us immediately (1-800-527-3690).

V. MATH OLYMPIAD WINNERS

The top 12 scoring students on the USAMO will be invited to attend an award ceremony held in Washington, D.C. June 20-21, 2004. Activities include a reception at the Mathematical Association of America Headquarters, a tour of the National Science Foundation, meetings with members of Congress, a reception at the National Academy of Sciences, and a celebration dinner with the mathematical sciences community at the U.S. Department of State Building.

VI MATHEMATICAL OLYMPIAD SUMMER PROGRAM

The top 12 scoring students on the USAMO will be invited to attend the Mathematical Olympiad Summer Program regardless of grade. In addition to the top 12 USAMO winners, 12-18 high-scoring USAMO participants, who are current juniors and below, will also be invited to participate in the Mathematical Olympiad Summer Program (MOSP).

Thanks to a grant from the Akamai Foundation, we will invite an additional (approximately) 30 ninth-grade USAMO participants for a MOSP program aimed at preparing them for Olympiad style competitions.

The Mathematical Olympiad Summer Program will be held on

the campus of the University of Nebraska - Lincoln June 13-July 3, 2004. Students will be treated to classes on advanced mathematical topics, special guest speakers, mathematical contest training, and related social and mathematical activities.

During the first week of MOSP a final "IMO" type exam will be given to the top 12 USAMO students with the goal of identifying the USA IMO team. This exam will replicate an actual IMO and will consist of 6 problems to be solved over two 4 1/2 hour sessions. The 12 equally weighted problems (6 on USAMO and 6 on this exam) will determine the tentative USA Team.

In order to assure that the strongest possible team has been formed, the MOSP Director/IMO Team Leader reserves the right to appoint up to one IMO team member. This appointment would happen only in a circumstance where a student's performance during the first two weeks of MOSP clearly surpasses that of an existing team member.

VII. THE INTERNATIONAL MATHEMATICAL OLYMPIAD

Each year (Greece in 2004, Mexico in 2005) the USA sends a team of six students to the International Mathematical Olympiad (IMO). Six of the top students on the 2004 USAMO will constitute the U.S.A.'s team, and the next two will be the alternates.

