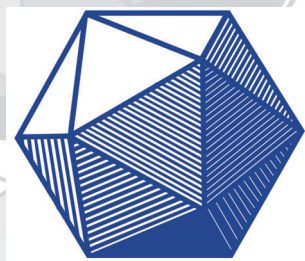


AIME Table of Contents

I. Content of Package	2
II. Policy on AIME Administration	2
III. Instructions Prior to the Day of the Contest	2
IV. Instructions for the Day of the AIME, Tuesday, March 23, 2004	3
V. Reports and Examination Materials to be Returned	3
VI. Report of the AIME Results	3
VII. List of the Sponsors of the American Mathematics Competitions	4
FORM A – Examination Certification 2004 AIME	5
FORM B – USAMO Information Form	6
FORM C – AIME Order Form for Prior Years Exams	7
FORM D – Alternate AIME Payment Form	9
VIII. Fascimile of the March 23, 2004 AIME Front Cover	11



The Mathematical Association of America
American Mathematics Competitions

I. CONTENT OF PACKAGE

You will find enclosed, in addition to this Teachers' Manual, the following material:

- ✓ A list of your qualified AIME students.
- ✓ A sealed envelope containing one AIME for each of your qualified students and an extra copy for you. The AIME rules are printed on the envelope and in this manual. The envelope must NOT be opened until just before the examination is given on the authorized date, preferably during the morning hours. The penalty for opening the sealed envelope earlier is disqualification.
- ✓ AIME Answer Forms. *One for each participating student.*
- ✓ One AIME School Identification Form.
- ✓ One AIME Report Envelope.
- ✓ One Alternate AIME Payment Form (page 9 in this Manual) and Return Envelope



II. POLICY ON AIME ADMINISTRATION

You must give the AIME on the official date (March 23) to all students in the same place and at the same time; invited students who cannot be there miss this opportunity. **Be advised that if students miss the exam this day, Tuesday, March 23, 2004, they may take the alternate sitting of the exam, April 6, 2004. If you need to have a student or students sit for the exam on April 6, read below for the applicable details and then contact the AMC office if you have questions. There is a minimal charge for the second exam due to compressed shipping considerations. These two dates will be the only dates acceptable for qualifying for the USAMO.**

There will be a processing fee for the second AIME as follows: 1-10 students = \$25, 11+ students = \$50. We will need your payment before the answer forms can be graded. A special envelope and payment form has been included with your AIME material. All Alternate AIME (AIME II) answer forms must be returned by "express mail" so that they arrive in the AMC office by April 9, 2004.

Email requests for the second AIME may be sent to:


AIMEQUAL@AMC.UNL.EDU

Or, you can call the AMC office at 800/527-3690. Please have your school identification number (CEEB) available before calling. E-mail requests should include the school's CEEB# and complete mailing address.

Under no circumstances can a student take both AIME's.

If one of your AIME qualified students is visually impaired and/or learning disabled please call the AMC office and we will discuss the options available to you. We do not have copies available in braille.

III. INSTRUCTIONS PRIOR TO THE DAY OF THE CONTEST

1. Please study the contents of this Teachers' Manual.
2. Reserve a room for 3 1/2 hours from 8:45 AM – 12:15 PM to administer the AIME on Tuesday, March 23, 2004 from 9AM – 12 noon. This allows 1/2 hour for pre- and post-examination activities and 3 hours for the examination itself. 
3. Inform the students well in advance of the time and place. Urge them to prepare for the AIME by studying past AIME exams and solutions, and other challenging problems. Refer to Order Form C-AIME ORDER FORM FOR PRIOR YEAR EXAMS on Page 7 in this manual for ordering information relating to prior year AIME exams.
4. Review the Examination Rules printed on the sealed envelope which contains the examination.
5. Obtain a supply of:
 - a. Number 2 lead pencils with good erasers
 - b. Unmarked scratch paper
 - c. Rulers, compasses, protractors, and graph paper.
6. **Calculators and Geometers are NOT permitted.**
7. Complete the AIME School Identification Form using the instructions found on the Form.
8. Please study the AIME STUDENT ANSWER FORM. Have each student complete Side 1 of the Form using the instructions found on the Form. **Please carefully follow the marking instructions printed on both the identification and student answer forms, and double check to see that all the items are filled out correctly. Only the information which has been properly blackened will be read by the Opscan reader. Be sure to mark the AMC 10 or AMC 12 score in the appropriate area, including decimals if needed.**
9. The AIME Answer Form is now ready for distribution to your qualified students on Tuesday, March 23.
10. Make arrangements to mail your AIME Report Envelope by First Class Mail (or Express Mail if taking the alternate date). *Please note that this is an oversized envelope and thus requires special postage even if it weighs one ounce or less.*



IV. INSTRUCTIONS FOR THE DAY OF THE AIME, TUESDAY, MARCH 23, 2004

1. Arrange for the Principal or Vice Principal to be present when you open the sealed envelope which contains the AIME(s).
2. Seat participants in alternate seats.
3. Ensure that each participant has the supplies listed on Item 5 under Section III.
4. Inform the students that they are not to open the exam booklet until instructed to do so.
5. Pass out the examination and have the students read the instructions on the front cover.
6. Next, distribute the AIME Answer Forms (which you or your students previously marked) to the students. Inform them that their answers should be marked **with a pencil** on SIDE 2 of the Form and that each problem has only one correct answer, an integer between 000 and 999 inclusive.
7. Read aloud the following instructions for recording answers to the problems:

- a. For each question you answer, USING A #2 PENCIL, for your reference write your answer at the top of the problem answer columns using 3 digits, then

in each of these columns blacken the one circle which is labeled with the digit you have written at the top. PLEASE NOTE: A single digit answer, such as 7, should be written and blackened as 007 and a two digit answer, such as 43, should be written and blackened as 043.



- b. DO NOT BLACKEN ANSWERS UNTIL YOU ARE CERTAIN OF YOUR FINAL CHOICE. AVOID, IF POSSIBLE, ERASURES IN THE CIRCLES.

- c. The results **will** be graded by computer. **Only the blackened circles will be graded.**

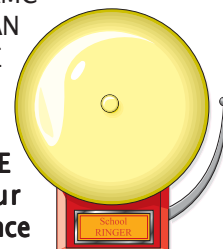
8. Ask the students if they have any questions about using the AIME Answer Form or about the instructions for the examination.
9. Start the Examination.
10. Check to see if each student is marking his/her Answer Form properly.
11. Allow exactly 3 hours working time.
12. If there is an urgent need to use a bathroom, inform the students that only one student may leave at one time and the AIME answer form and exam should be retained by you during the departure period. If there is a health or medical emergency a backup exam manager should be available if such a contingency occurs.
13. At the end of 3 hours, instruct the students to:

- a. STOP.
- b. Put aside the booklet and scratch paper and look again to be sure the AIME Answer Form has been filled out correctly.
- c. **Be sure the written answers on the top of the AIME Answer Form are in agreement with the blackened circles coded answers.**
- d. Sign their name on Side 2 of the answer form.
- e. Hand in the AIME Answer Form.
- f. Keep the examination booklet for their reference in conjunction with your review of the Solutions. Inform the students that they may now leave the examination room.

14. Complete the Certification Form A and USAMO Information Form B found on pages 5 and 6.

15. Mail the material requested (See Section V) in the AIME REPORT ENVELOPE to the AMC Office, postmarked NO LATER THAN 24 HOURS AFTER THE EXAMINATION.

16. Please note that if you have requested the "Alternate" AIME you will need to send your payment separately and in advance of the April 6th test date.



V. REPORTS AND EXAMINATION MATERIALS TO BE RETURNED

The following material should be sealed in the AIME Report Envelope and postmarked NO LATER THAN 24 hours after the examination is given:

1. Signed AIME Certification Form A and USAMO Information Form B.
2. AIME School Identification Form.
3. One AIME Answer Form for each participating student. **Please do not paper clip or staple the forms together. Do not fold the forms.**

APO/FPO AND USA EMBASSY SCHOOLS must return materials by AIR EXPRESS MAIL (DHL, Federal Express, etc.).

VI. REPORT OF THE AIME RESULTS

The AIME score of your student(s), Certificates of Participation, an AIME Solutions Pamphlet and the list of USAMO selectees will be sent to you. **No AIME results will be given out by telephone until after APRIL 12.**

Please retain this report for future reference, either in your files or with the student counselor's office. Many students cite these scores on college applications.

VII. LIST OF THE SPONSORS OF THE AMERICAN MATHEMATICS COMPETITIONS

The

American Mathematics Competitions

are Sponsored by

The Mathematical Association of America — MAA www.maa.org/
University of Nebraska – Lincoln — UN-L..... www.unl.edu/

Contributors

The Akamai Foundation – www.akamai.com
American Mathematical Association of Two Year Colleges – AMATYC www.amatyc.org/
American Mathematical Society — AMS www.ams.org/
American Society of Pension Actuaries — ASPA www.aspa.org/
American Statistical Association — ASA www.amstat.org/
Art of Problem Solving — www.artofproblemsolving.com/
Canada/USA Mathpath & Mathcamp — C/USA MP/MC www.mathcamp.org/ & www.mathpath.org/
Casualty Actuarial Society — CAS www.casact.org/
Clay Mathematics Institute — CMI www.claymath.org
Consortium for Mathematics and its Applications — CMA info@comap.com
Institute for Operations Research and the Management Sciences — INFORMS www.informs.org/
Mu Alpha Theta — MAT www.mualphatheta.org/
National Council of Teachers of Mathematics — NCTM www.nctm.org/
Pedagoguery Software Inc. — www.peda.com/
Pi Mu Epsilon — PME www.pme-math.org/
Society of Actuaries — SOA www.soa.org/

The National Association of Secondary School Principals has placed the AMC 8, AMC 10 and the AMC 12 on the NASSP, National Advisory List of Contests & Activities for 2003-2004.

FORM A – EXAMINATION CERTIFICATION 2004 AIME

The Examination Manager and the Principal, Vice Principal, or Headmaster must sign this form which is to be returned with your student Answer Forms.

Certification by the Principal, Official or person with comparable title:

- a) I certify that the exam package(s) were retained in their sealed condition within a half hour of the start of the examination;
- b) I accept for our school the rules and procedures described on this page and page 2, and accept that failure to follow these rules and procedures may result in **DISQUALIFICATION** from official standing of all scores from our school.

Signature _____ Time _____

Title _____ Date _____

Certification by the Examination Manager:

I certify that the 2004 American Invitational Mathematics Examination was given today, Tuesday, March 23, 2004; that all students who took it did so at the same time and place; that only invited students took it; that the 3-hour time limit was strictly enforced; that the test envelope was sealed until the time of the test; that no student had access to the test questions in advance; that the students were continually supervised by a certified teacher while they were taking the test; that I am returning those materials as required in Section V; and that all other rules for administering the test were followed.

YES NO If no, describe the exceptions on a separate sheet of paper.

I also certify that I understand and accept the following for our school. The Committee on the American Mathematics Competitions reserves the right to:

1. Disqualify all scores from our school if it is determined that the required security procedures were not followed.
2. Re-examine students if, after an inquiry, there is a reasonable basis to believe that the scores do not validly represent the ability of the students. (The procedures for disqualification, follow-up inquiries and re-examination are similar to those for the AMC 10 and AMC 12, as outlined in the AMC 10/12 Teachers' Manual.)

Signature of AIME School Manager _____

Date _____ School Telephone # _____

Name of School _____

State _____

School Identification Number (CEEB) _____

The AIME was administered on **March 23, 2004**..... YES please circle **NO**

Starting Time _____ Ending Time _____

Please also complete the OLYMPIAD INFORMATION Form B, found on Page 6.

FORM B – USAMO INFORMATION FORM

When a student qualifies for the United States of America Mathematical Olympiad (USAMO), both the student and the USAMO School Manager are notified at least one week before the USAMO date. Don't worry about an invitation getting lost in the mail. When a USAMO invitation is extended, both the student and the USAMO School Manager must complete and return a USAMO Response Form. If the Form is not returned, we do a follow-up.

Please provide the information requested below if you agree to administer the USAMO. There is no fee for participating in the USAMO.

AGREEMENT STATEMENT:

In the event that I have a qualifying student(s), I or my designee (indicated below) agree to:

1. Serve as the USAMO School Manager.
2. Administer the USAMO on **Tuesday, April 27** , and **Wednesday, April 28, 2004**, to the student(s) in my school who qualify and not to any other students.
3. Arrange for the exclusive use of a room for four and a half hours (from 12:30 p.m. to 5:00 p.m., eastern daylight time or your time zone equivalent, see below) on the designated days which will be used to administer the USAMO.
4. Be present in the room to supervise the student(s) during the entire nine hours duration of the examination.
5. Have the ability to fax the students answer sheets to the central location immediately, to be graded with the rest of the papers at the central location.

I understand that results of my participating USAMO students could be voided if the rules and procedures associated with the administration of the USAMO are not followed.

Signature _____

Telephone Number _____ Date _____

Name of USAMO School Manager _____

eMail _____

School _____ CEEB#: _____

City _____ State _____ Zip _____

PLEASE NOTE THIS YEARS 4.5 HOURS PER DAY TIME LENGTH AND 2 DAYS LENGTH FOR THE 2004 USAMO:

TUESDAY, April 27, 2004

- 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

&

WEDNESDAY, April 28, 2004

- 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

FORM C – AIME ORDER FORM FOR PRIOR YEARS EXAMS

If you wish to order any of these publications complete the order form below and mail to:
 American Mathematics Competitions, ATTN: Publications, PO Box 81606, Lincoln, NE 68501-1606.
 To expedite delivery you may fax your order (402-472-6087). **VISA & MASTERCARD accepted.** (Call 1-800-527-3690).

For each publication below write the quantity of each you wish to order in the blank beside the year or volume

AMERICAN INVITATIONAL MATHEMATICS EXAMINATION

1989_____1990_____1991_____1992_____1993_____

1994_____1995_____1996_____1997_____1998_____1999_____

From 2000 on there were 2 versions of the AIME given:

	2000	2001	2002	2003
AIME 1	_____	_____	_____	_____
AIME 2	_____	_____	_____	_____

Total quantity of AIMEs_____ @ \$ 2.00 = \$ _____

Minimum Order \$10.00 (Before Postage)

Subtotal \$ _____

	<u>ORDER TOTAL</u>	<u>SHIPPING CHARGE</u>	
U.S.A. & CANADIAN POSTAGE:	\$10.00--\$40.00	\$7.00	
	\$40.01--\$50.00	\$9.00	
	\$50.01--\$75.00	\$12.00	
	\$75.01--UP	\$15.00	

INTERNATIONAL POSTAGE:	Under 2 pounds	\$30.00	
	Over 2 pounds	\$50.00	\$ _____
PAYABLE ONLY IN U.S. FUNDS		\$\$\$ GRAND TOTAL	\$ _____

ORDER RECORD (Please Print)

CEEB # _____

Name _____

School _____

City _____

State _____

Zip _____

VISA or MASTERCARD Number: _____

Exp. Date _____

Cardholder Signature _____

Email _____

**Your comments
welcome!**

FORM D – ALTERNATE AIME PAYMENT FORM

2004 *Alternate* AIME

Tuesday, April 6, 2004

PLEASE PRINT

School CEEB # __ __ __ __ __ __

Contest Manager: _____

School Name: _____

School Address: _____

City: _____ State: _____ Zip: _____

School Phone #: _____

E-mail: _____

There will be a processing fee for the second AIME as follows: 1-10 students = \$25, 11+ students = \$50. We will need your payment before the answer forms can be graded. A special envelope and payment form has been included with your AIME material. All AIME answer forms must be returned by "express mail" so that they arrive in the AMC office by April 9, 2004.

Number of AIME qualifiers who will be taking the *alternate* AIME on Tuesday, April 6, 2004:

Number of Alternate Exams Requested: # _____

1-10 student qualifiers @ \$25.00	}	\$ _____
11+ student qualifiers @ \$50.00		

Method of Payment:

- Check enclosed (US funds only) made payable and mailed with this form in the BUSINESS REPLY/postpaid envelope provided:

AMERICAN MATHEMATICS COMPETITIONS
 University of Nebraska-Lincoln
 PO Box 880658
 Lincoln, NE 68588-0658

- Charge to Visa/Mastercard #:

Name on card (print): _____

Signed: _____

Expiration Date: _____ Telephone: _____

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VIII. FASCIMILE OF THE MARCH 23, 2004 AIME FRONT COVER

MATHEMATICAL ASSOCIATION OF AMERICA
AMERICAN MATHEMATICS COMPETITIONS



22nd Annual

AMERICAN INVITATIONAL
MATHEMATICS EXAMINATION
(AIME)

Tuesday, March 23, 2004

1. DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO BY YOUR PROCTOR.
2. This is a 15-question, 3-hour examination. All answers are integers ranging from 000 to 999, inclusive. Your score will be the number of correct answers; i.e., there is neither partial credit nor a penalty for wrong answers.
3. No aids other than scratch paper, graph paper, ruler, compass, and protractor are permitted. In particular, calculators and geometers are not permitted.
4. A combination of the AIME and the American Mathematics Contest 10 or the American Mathematics Contest 12 scores are used to determine eligibility for participation in the U.S.A. Mathematical Olympiad (USAMO). The USAMO will be given on TUESDAY and WEDNESDAY, April 27 & 28, 2004.
5. Record all of your answers, and certain other information, on the AIME answer form. Only the answer form will be collected from you.

The publication, reproduction, or communication of the problems or solutions of the AIME during the period when students are eligible to participate, seriously jeopardizes the integrity of the results. Duplication at any time via copier, telephone, email, world wide web, or media of any type is a violation of the copyright law.

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Mathematical Association of America

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