



Spring 2006 - Special

# AMC's Math Messenger

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## WHAT: Colleges/Universities administering the MAA's AMC 10/12 Contest

WHO: Institutions of Higher Education hosting High School Math Students

WHEN: WEDNESDAY, February 21, 2007

WHERE: Your College or University

- WHY:
- ◆ Attract bright, motivated and highly qualified students to your department and major
  - ◆ Allows students whose schools do not offer the MAA High School contests to participate
  - ◆ Uses a well-known, high quality contest with rich mathematical questions
  - ◆ Outreach, service and publicity for your department with minimum time and effort

HOW: See more information below or contact the AMC :

Email: [amcinfo@unl.edu](mailto:amcinfo@unl.edu)

Phone: 800/527-3690

Fax: 402/472-6087

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The Mathematical Association of America's American Mathematics Competitions invites your college or university to take part in a new facet of our AMC contests planned for the 2006-2007 school year.

To provide an ideal recruiting opportunity for you, create an outreach activity with minimal effort and to offer more opportunities for students and schools to participate in the AMC 10 and AMC 12 contests, we will be encouraging Colleges and Universities to offer the AMC 10/12 contest on their campuses for students in their region. We have attached a copy of the AMC 10/AMC 12 2007 Brochure, to give you a general background on these contests.

The B Contest will be held WEDNESDAY, February 21, 2007. In this new program the contest, traditionally given at local high schools, will also be available to be administered by the math department of your institution. This provides an opportunity for college bound students to visit your campus. Mathematical talks, informational sessions and tours for prospective students can be arranged to round out their visit to your campus for the contests.

If your institution chooses to participate in this program, once you have registered in the fall we will post the name of your campus on our web site, along with contact information for interested parties. In this way students/schools who plan to attend can make arrangements directly with

you. You can also recruit schools and students for your contest administration.

### 1. PURPOSE

Both AMC 10 and AMC 12 are 25-question, 75-minute multiple-choice contests. The AMC 12 covers the high school mathematics curriculum, excluding calculus. The AMC 10 covers subject matter normally associated with grades 9 and 10. To challenge students at all grade levels, and with varying mathematical skills, the problems range from fairly easy to extremely difficult. Approximately 12 questions are common to both contests. Our purpose is to increase interest in mathematics and to develop problem solving through a friendly, fun competition.

### 2. PARTICIPATION

The contests are given on your campus at the same time to all participating students in a convenient 75-minute interval, preferably in the morning, but an "after school" time slot is also acceptable. The contests should be proctored by faculty/staff members of the participating institution.

### 3. RESULTS & AWARDS

Each participating institution receives a copy of the contest and solutions, a results report for the students participating at your institution, and the National Summary of Results

and Awards booklet. We will provide awards for students. You may also decide to give special awards to the top students who take part.

Regional sites with at least three participants will be eligible for a special group of national awards, based on student scores.

AMC 12 students who rank in the top 5% nationally (or score at least 100) will qualify for the American Invitational Mathematics Exam (AIME). AMC 10 students who rank in the top 1% nationally (or score at least 120) will also qualify for the AIME. The USAMO (USA Mathematical Olympiad) qualifiers are picked from the top students on the AIME.

You may be requested to host one or more AIME qualifiers for the AIME contest on March 8, and perhaps even host a USAMO qualifier on April 24-25, 2007. These highly capable students will be top prospects for your institution.

#### 4. REGISTRATION

If you would like to participate, please contact our office for a College Registration Packet. This will give you the details on the registration and administration of this program. You can then sign-up to be an institutional regional site by mailing the Registration Form included in the packet or on the web at [www.unl.edu/amc](http://www.unl.edu/amc).

Regional sites should keep a list or data base of all students who have enrolled for the contest at their particular institution. This information will include schools for each student, and school contact information, for score distribution to students and for use if the student qualifies for the AIME.

Spanish and French editions of the 2007 AMC 10 and AMC 12 may be requested. Braille and large print editions are also available. All requests for these special versions must be made no later than three weeks before the contest.

#### 5. COSTS

Registration cost for regional sites will be \$60.00, and will include contest preparation, scoring and expedited shipping. We allow you to enroll students up until two weeks before the contest (February 7<sup>th</sup>), to allow us time to ship you the contests. Cost for the individual contests will be the same as for the high schools:

AMC 10, one bundle of 10 contests -- \$14.00, or \$1.40 per student

AMC 12, one bundle of 10 contests -- \$16.00, or \$1.60 per student

These costs can be handled in several ways. The hosting institution can charge a minimal fee per student for each participant taking the contest or the costs can be absorbed by the host institution, or a combination of the above.

Schools using a credit card or purchase order may register by mailing the Registration Form included with the Registration packet, or fax the form to us at 402-472-6087. We accept Visa and Mastercard. When paying by check please mail your registration form with payment well in advance of the deadline dates.

## INTERNATIONAL MATHEMATICAL OLYMPIAD

The 2005 International Mathematical Olympiad (IMO), was the 46<sup>th</sup> in the annual series of mathematical competitions for high school-age students. At the 2005 IMO, 513 of the best young mathematicians from 93 countries competed in solving 6 problems posed in a grueling nine-hour test administered over two days (July 13 and July 14). The competition poses six math questions to be solved that would daunt even some professional mathematicians. Overall, the IMO awarded 43 gold medals, 80 silver and 129 bronze medals. More details on the IMO are available on the web at [www.imo2005.org](http://www.imo2005.org). The 2006 IMO will be held July 10-18, in Ljubljana, Slovenia.

Overall, the six members of the USA team won 4 Gold medals and 2 Silver medals. The team from China ranked first overall. The USA team ranked second among all 93 participating countries.

- ♦ **Robert Cordwell**, who graduated from Manzano High School in Albuquerque, New Mexico, received a Gold medal.
- ♦ **Sherry Gong**, who attends Philips Exeter Academy in Exeter New Hampshire, and is from San Juan, Puerto Rico, received a Silver medal.
- ♦ **Hyun Soo Kim**, who graduated from Academy for Advancement of Science and Technology in Hackensack, New Jersey, received a Silver medal.
- ♦ **Brian Lawrence**, who attends Montgomery Blair High School of Silver Spring, Maryland, received a Gold medal and had a perfect paper.
- ♦ **Thomas Mildorf**, who graduated from Thomas Jefferson High School of Science and Technology in Alexandria, Virginia, won a Gold medal.
- ♦ **Eric Price**, who also graduated from Thomas Jefferson High School of Science and Technology in Alexandria, Virginia,



*The 2005 United States IMO Team, from left: Zuming Feng - Head Coach, Brian Lawrence, Thomas Mildorf, Sherry Gong, Robert Cordwell, Hyun Soo Kim, Eric Price, and Melanie Wood - Assistant Coach.*

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## MATH CLUB PACKAGE

Once again we are offering a Math Club Package. This will include a Club Advisor's Handbook, including 50 different problems, presented in the same format as the Student Practice Questions in the back of the 2005-2006 AMC Teacher Manuals. In addition, we plan to have web based resources such as a mini quiz of the month and a question of the week for club use.

The

American Mathematics Competitions  
are Sponsored by

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The Akamal Foundation

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### Teacher Comments:

This is the first time I've participated, and I am pleased. I will use these questions on my warm-ups so students will know the correct answers and discuss strategies. Thank you.

I like the practice options with the kit and web and the flexible time frame.

I will continue to run the AMC contests as the questions are so good and our students get a lot from trying them. Thank you for the effort that goes in to producing such a rich variety of questions each year.

In my middle school classes, important results we learned from practicing on the AMC 8 ... material become fair game for the next test -- I actually expect the kids to remember ..... There's no reason kids should be expected to learn (and be able to use) only the material in their textbook.

The richness of these problems has been a great place for math discussions for the couple of days following the exam each year, where we can talk about math and not be worrying about some grade for the class.

**For information on the American Mathematics Competitions, visit our website:**  
<http://www.unl.edu/amc/>

### 2006-2007 AMC contest dates:

AMC 8 - TUESDAY, November 14, 2006  
AMC 10 & 12 - TUES., February 6, 2007  
&/or WED., February 21, 2007  
AIME I - TUES., March 13, 2007  
or WED., March 28, 2007  
USAMO - April 24-25, 2007

# Make Mathematical History

## AMC 10 AMC 12

## American Mathematics Competitions

The Mathematical Association of America

The National Association of Secondary School Principals (NASPP) has placed the AMC 8, AMC 10, and AMC 12 on the NASPP National Advisory List of Contests and Activities for 2006-2007.



2004 IMO -- Athens, Greece

2005 IMO -- Mérida, Yucatán, México

2006 IMO -- Ljubljana, Slovenia

[www.unl.edu/amc](http://www.unl.edu/amc) [amcinfo@unl.edu](mailto:amcinfo@unl.edu) 800/527-3690

# AMC 10 & AMC 12

In 2007 join the thousands of students who will take part in the 58th Annual American Mathematics Competitions - AMC 10 and AMC 12.

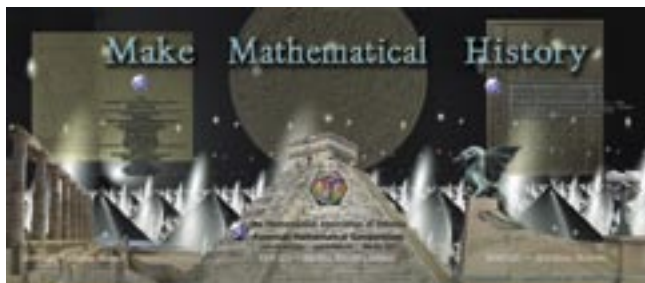
- ⚙ AMC 10 (American Math Contest 10, 10<sup>th</sup> grade and below)
- ⚙ AMC 12 (American Math Contest 12, 12<sup>th</sup> grade and below)

The Contests will be held **TUESDAY, February 6, 2007** and/or **WEDNESDAY, February 21, 2007**.

## 1. PURPOSE

Our purpose is to increase interest in mathematics and to develop problem solving through a friendly, fun competition. Both AMC 10 and AMC 12 are 25-question, 75-minute multiple-choice contests administered in your school by you or a designated teacher.

When you register for the AMC 8 or the AMC 10/12, we will include a free gift – a set of three posters (each 17"x22"), on this year's theme **Make Mathematical History**.



## 2. PARTICIPATION & ELIGIBILITY

The AMC 12 covers the high school mathematics curriculum, excluding calculus. The AMC 10 covers subject matter normally associated with grades 9 and 10. To challenge students at all grade levels, and with varying mathematical skills, the problems range from fairly easy to extremely difficult. Approximately 12 questions are common to both contests.

**AMC 12 Eligibility** – A student in a program leading to a high school diploma, and under 19.5 years of age on the day of the contest.

**AMC 10 Eligibility** – A student in a program leading to a high school diploma, under 17.5 years of age on the day of the contest, and not enrolled in grades 11 or 12 or equivalent.

**Home schools** must indicate the site of the exam (not the student's home) and the name of the proctor (not a parent) and attach this information to the registration form. *Please call the AMC office for details.*

## 3. ADMINISTRATION

The AMC 10A and 12A is on **TUESDAY, February 6, 2007**, and the AMC 10B and 12B is on **WEDNESDAY, February 21, 2007**. The contests are given at the same time to all

participating students in a convenient 75-minute interval, preferably in the morning. The contests should be proctored by a faculty member of the participating school.

To offer more opportunities for students and schools to participate, this year the AMC will be encouraging colleges and universities to offer the AMC 10B/12B on their campuses. Contact local college and university math departments to see if they will be offering the B-date contests in your area. In the fall we will post the names of participating institutions on our web site.

## 4. REGISTRATION AND FEES

You can register by mailing the Registration Form included in this brochure or on the web at [www.unl.edu/amc](http://www.unl.edu/amc).

- Registration/Standard Shipping (Contest A only) \$40
- Registration/Expedited Shipping (Dec 16-Jan 16) \$50
- **Registration/Overnight Shipping 12A (Jan 17-Jan 31) \$60**
- **Registration/Overnight Shipping 12B (Jan 17-Feb 13) \$60**

One bundle of 10 contests for the AMC 10 is \$14.00 and for the AMC 12 is \$16.00. Schools using a credit card or purchase order may register via the Web ([www.unl.edu/amc](http://www.unl.edu/amc)) or fax to us at 402-472-6087. We accept Visa and Mastercard. When paying by check please mail your registration form with payment well in advance of the deadline dates.

Spanish and French editions of the 2007 AMC 10 and AMC 12 may be requested. Braille and large print editions are also available. All requests must be made no later than three weeks before the contest.

Early registration will reduce your cost and provide you extra time to fully utilize the study guide found in the Teachers' Manual.

## 5. SCHOOL RESULTS & STUDENT AWARDS

Each participating school receives a copy of the contest and solutions, individual school results, school awards and the National Summary of Results and Awards booklet.

Schools with at least three participants on a contest date will be eligible for team, state and national awards. The USA and Canada are divided into eleven contest regions and National Awards are given in each region to the top five schools and top ten students who officially participate in the contests. There are a variety of other national and student awards, which can be seen by visiting our web site.



AMC 12 students who rank in the top 5% nationally (or score at least 100) will qualify for the American Invitational Math-

ematics Exam (AIME). AMC 10 students who rank in the top 1% nationally (or score at least 120) will also qualify for the AIME. The USAMO (USA Mathematical Olympiad) qualifiers are picked from the top students on the AIME.

## 6. EDYTH MAY SLIFFE AWARD

The **Edyth May Sliffe Award for Distinguished High School Teaching** is given each year to at least twenty teachers, based on students who do well on the AMC 12 and the nominations of the student team members. The winners receive a cash prize, a certificate, and a one-year complimentary membership in The Mathematical Association of America (MAA).

## 7. 2005 AMC 10A SAMPLE QUESTIONS

- 10-#9. Three tiles are marked X and two other tiles are marked O. The five tiles are randomly arranged in a row. What is the probability that the arrangement reads XOXOX?  
(A) 1/12 (B) 1/10 (C) 1/6 (D) 1/4 (E) 1/3
- 10-#19. Three one-inch squares are placed with their bases on a line. The center square is lifted out and rotated 45°, as shown. Then it is centered and lowered into its original location until it touches both of the adjoining squares. How many inches is the point B from the line on which the bases of the original squares were placed?



- (A) 1 (B)  $\sqrt{2}$  (C) 3/2 (D)  $\sqrt{2} + \frac{1}{2}$  (E) 2
- 10-#3, 12-#2. The equations  $2x + 7 = 3$  and  $bx - 10 = -2$  have the same solution  $x$ . What is the value of  $b$ ?  
(A) -8 (B) -4 (C) -2 (D) 4 (E) 8
- 10-#5, 12-#6. A store normally sells windows at \$100 each. This week the store is offering one free window for each purchase of four. Dave needs seven windows and Doug needs eight windows. How many dollars will they save if the purchase the windows together rather than separately?  
(A) 100 (B) 200 (C) 300 (D) 400 (E) 500
- ## 8. 2005 AMC 12A SAMPLE QUESTIONS
12. A line passes through  $A(1,1)$  and  $B(100,1000)$ . How many other points with integer coordinates are on the line and strictly between  $A$  and  $B$ ?  
(A) 0 (B) 2 (C) 3 (D) 8 (E) 9
19. A faulty car odometer proceeds from digit 3 to digit 5, always skipping the digit 4, regardless of position. For example, after traveling one mile the odometer changed from 000039 to 000050. If the odometer now reads 002005, how many miles has the car actually traveled?  
(A) 1404 (B) 1462 (C) 1604 (D) 1605 (E) 1804

Answers  
10A-9, (B), 19, (D)  
10A+12A: 10-#3, + 12-#2, (B), 10-#5, + 12-#6, (A)  
12A: 12, (D), 19, (B)