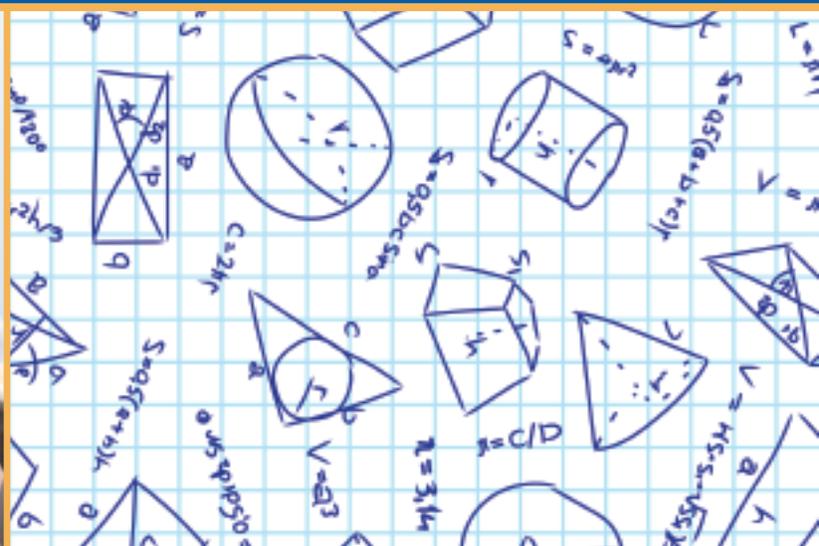


MAA American Mathematics Competitions

2016 AMC 8

TEACHER'S MANUAL

A guide for administering a successful and rewarding AMC 8 Competition



COMPETITION DATE: TUESDAY, NOVEMBER 15, 2016



MAA AMC
American Mathematics Competitions

Mathematical Association of America
PO Box 471 Annapolis Junction, MD 20701

800-527-3690 • amc.maa.org

WELCOME TO THE 32ND AMC 8 COMPETITION

11.15.2016

*Students all over the
country will compete!*

What is the AMC Program?

The Mathematical Association of America's American Mathematics Competitions program leads the nation in strengthening the mathematical capabilities of the next generation of problem-solvers. Through classroom resources and friendly competition, the MAA AMC program helps America's educators identify talent and foster a love of mathematics. The MAA AMC program positively impacts the analytical skills needed for future careers in an innovative society.

The American Mathematics Competitions are a series of examinations and curriculum materials that build problem-solving skills and mathematical knowledge in middle and high school students.

What is the AMC 8?

The AMC 8 is a 25-question, 40-minute, multiple choice examination in middle school mathematics designed to promote the development and enhancement of problem-solving skills.

When is the AMC 8?

This competition is administered around the country on Nov. 15, 2016. Registrations are accepted until Nov. 1, 2016.

Why host the AMC 8?

- Help your middle school students discover their love of problem-solving by preparing them for the AMC 8. By the time many students are in high school, they have solidified their perceptions of themselves as mathematics students without fully exploring their potential as analytical thinkers and problem-solvers.

- The AMC 8 provides an opportunity for middle school students to develop positive attitudes towards analytical thinking and mathematics that can assist in future careers by applying classroom learned skills to unique problem-solving challenges in a low-stress and friendly environment.
- 1 million additional STEM graduates will be needed by 2022 to fill the demands of the labor market. The AMC 8 can help your students identify an interest in and prepare for STEM careers that will challenge and fulfill them.

$$a^2 + b^2 = c^2$$

**1 MILLION ADDITIONAL
STEM GRADUATES
WILL BE NEEDED BY 2022
TO FILL THE DEMANDS
OF THE LABOR MARKET.**

Pre-Exam Preparation

How do you prepare students for the AMC 8?

Discuss questions and solutions from previous AMC 8 competitions so that students will know what type of questions to expect when they take the AMC 8 on Nov. 15, 2016.

Who is eligible to participate in the AMC 8?

Students with a passion for problem-solving who are in grade 8 or below and under 14.5 years of age on the day of the contest are eligible to participate.

Benefits for Teachers

The Mathematical Association of America provides classroom prep materials to educators free of charge. Registering as a competition manager gives you a membership to the MAA as a K-12 Teacher member. Explore the benefits for you and your classroom:

- The MAA Curriculum Inspirations project provides free video and print materials, based on past AMC questions to help teachers and students develop high-level mathematical skills. All Curriculum Inspirations videos and materials are cross-referenced to the Common Core State Standards in Mathematics and designed to capture your students' interest in creative problem-solving while complementing your Common Core-based lesson plans.
- Competition managers receive Math Messenger throughout the year, a monthly email with AMC updates, sample problems, mathematics news and the latest classroom tips.
- Complimentary subscription to Math Horizons, a digital magazine that brings you articles, problems, contests, REU profiles, career ideas, and book reviews each quarter.
- Complimentary subscription to MAA Focus, a digital news magazine full of ideas in mathematics and mathematics education every other month.
- Enroll your students in AMC Advantage, an on-demand, self-paced online prep course for students of all levels. AMC Advantage offers skill-building problem sets on key AMC topics as well as full-length mock tests and their solutions.

Pre-exam checklist for AMC 8:

- Complete and collect the answer forms for redistribution on the competition date.
 - Please review all answer forms to ensure that they have been marked correctly!
 - Students must use their full legal name, no nicknames or abbreviations. Have them pay special attention to marking their name and address accurately. Remind them that student names listed on the AMC website come from this form. **The AMC program office will not do any editing of the information provided on the answer form.**
- Ensure that students complete the following sections of the answer form. Failure to do so will forfeit their results or cause delays in scoring. The most common errors are filling in more than one circle in a column or not completely filling in the circles. View correct examples on the AMC 8 information page.
 - (1) Last Name (2) First Name (3) Middle Initial (4) Section Letter (if applicable) (5) Age/date of birth, grade, and gender
- Reserve a quiet room for at least 70 minutes on Nov. 15, to allow time for pre- and post-examination activities.
- Review the rules that are included with the AMC 8 printed test bundles.
- **Tips for first-time participants.** Encourage participation by students who have not taken these competitions before. Help them prepare and make sure they know what to expect. For new students, getting even a few questions correct is an accomplishment. Make sure they set appropriate goals for themselves, so that the competition is a positive experience for every student.
- The day before the competition, remind students of the time and place of the AMC 8.
- Make arrangements to mail the AMC 8 Report Envelopes with a mail service that offers tracking.
- Obtain a supply of #2 pencils with good erasers, and unmarked scratch paper. Inform students that no aids are permitted other than scratch paper, graph paper, rulers, protractors, and erasers. **NO CALCULATORS OR ELECTRONIC DEVICES OF ANY KIND ARE ALLOWED.** No AMC 8 questions require the use of a calculator.

Competition Day

Administering the AMC 8 - What You Need To Know

Use these checklists to host a successful competition.

Before the exam

Note to teachers: Do not open the test bundles until just before you are ready to hand the exams to the students.

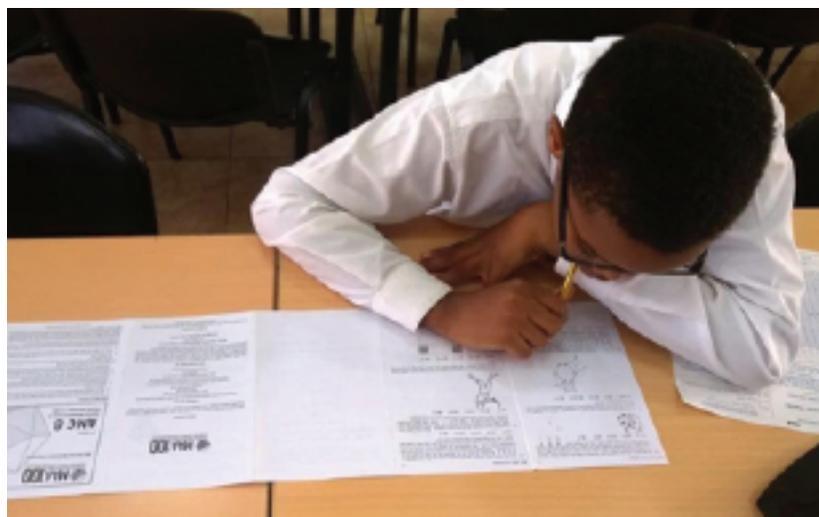
- Seat students so they are separated by an empty space, if possible.
- Hand out the previously completed answer forms and provide a #2 lead pencil with a good eraser for each student.
- Open the test bundles, hand out the AMC 8 booklet and inform the students that they are not to open the competition booklet until instructed to do so.
- Instruct students to read the entire front cover of the AMC 8 test. Allow 3 minutes for students to review the front cover.
- Tell your students to be **AS CERTAIN AS POSSIBLE OF THEIR ANSWERS BEFORE THEY MARK THE ANSWER FORM**. Forms that contain stray marks may not be read correctly by the scanner that scores the competition. Tell your students to take special care to mark the answer in the row that corresponds to the correct problem number.
- Ask if there are any questions about examination procedures. Inform students that talking or asking questions during the competition is not allowed. They must do their own work.
- When it is time to begin, tell students to unfold the competition booklet to see all the problems and to be careful to match their answers to the corresponding question. Remind students that there are 25 problems and that they have 40 minutes to complete the competition. Then tell them to **BEGIN**.

**AFTER THE FORMS ARE HANDED IN,
CHECK THAT EACH STUDENT'S NAME
IS BUBBLED IN
CORRECTLY ON THE FORM.**

During the exam

Note to teachers: The competition should be proctored continuously as you would for any important test. The proctor must warn any students whose eyes wander and disqualify any students caught copying answers or collaborating. Try to provide as quiet an environment as possible. Be sure that no student has access to a calculator or calculating device during the competition.

- Announce when there are 15 minutes left and when there are 5 minutes left.
- When time is up at 40 minutes, tell the students to **STOP** and have them sign their name in the space provided on the student answer form. Collect the answer forms and exams as quickly as possible.
- Collect all the students' competition booklets following the administration of the competitions. As the answer forms are handed in, check that each student's name is correct on the form and that it is bubbled in completely.
- Inform the students that the competition and solutions **may not be discussed with anyone** outside of the room either orally or digitally, i.e. email, internet, or social media of any type until after the competition period is over (one week after the official competition date). The competition booklets must be collected from the students directly after the competition, but they may be returned 24 hours after the competition period is over.



Competition Day

Administering the AMC 8 - What You Need To Know

Use these checklists to host a successful competition.

After the exam

- **Please do not grade the answer forms.** Send them to the AMC for grading.
- Check student answer forms for complete personal information (name, DOB, gender, etc.).
- Arrange the forms by section with each form facing the same direction with the same side up. REMOVE ALL PAPER CLIPS, RUBBER BANDS OR NOTE PAPER ATTACHED TO ANY ANSWER FORMS. PLEASE FAN THE FORMS TO SEPARATE ANY THAT MIGHT BE STUCK TOGETHER.
- Place no more than 200 forms in one report envelope.
- Do not return blank forms or teacher “practice” forms.
- Complete the [Certification Form](#) and ask your Principal or person with comparable title to sign the [Certification Form](#) and complete the rest of the form.
- Place the School ID Form on top of the answer forms and insert in the report envelope.
- Place the [Certification Form](#) in the AMC 8 report envelope with the answer forms, seal the envelope and send it by a trackable mail service within 24 hours or as soon as possible after all examinations have been administered.
- Indicate the number of packages you are returning in the space provided on the Report Envelope.
- Affix adequate postage to the AMC 8 report envelope.
- **Note to teachers:** The AMC 8 student answer forms sent to the AMC office in Annapolis Junction, MD for grading will not be returned.
- After you have delivered all of the answer forms to the school office to be mailed, you may discuss the competition and solutions with your students. Remember that there will be schools taking the competition in other locations at different times, and some will be taking the competition on other “window” dates. Hence, it is important that no one discuss problems and solutions in any online or public forum.

AMC Toolkit:

Results and Resources for Competition Managers:

The AMC office will send results in a digital report by email as soon as the answer forms are scored. If you have not received your results via email from the AMC program within 30 days after the AMC 8 is administered, please contact amcinfo@maa.org to verify that your answer forms were in fact received.

Please retain this digital report for future reference, either in your files or with the student counselor’s office. Many students cite these scores on applications to college and beyond. AMC cannot look up individual student scores after the competition cycle has been completed.

What’s New with AMC Results in 2016-2017?

- In an effort to give AMC competition managers access to results quicker than ever, score reports will be emailed to competition managers as part of a digital toolkit.
- The AMC Toolkit: Results and Resources for Competition Managers will be emailed to competition managers. Please add amcinfo@maa.org to your list of approved email contacts so that you receive important emails.
- Use this digital toolkit to access your students’ results and find resources for problem-solving classroom lessons.
- The AMC Toolkit: Results and Resources for Competition Managers is not just a listing of scores. It’s also a valuable resource for your classroom!
 - Check out MAA’s Top Ten Problem-Solving Strategies. These videos and essays bring excitement to mathematics learning and thinking.

**THE AMC OFFICE WILL SEND RESULTS
IN A DIGITAL REPORT BY EMAIL AS SOON AS
THE ANSWER FORMS
ARE SCORED.**

AMC Policies

Policy for Changes: The Committee on AMC may, from time to time, change the program rules, regulations, awards and conditions of participation in whole or in part. Whenever possible competition managers will be notified of these changes ahead of time.

Early administration is NEVER permitted and will lead to a disqualification of the results. Such an administration would jeopardize the validity of all scores from other schools.

Official administration: If you are unable to give the competition on Nov. 15, 2016 because, for example, your school is closed, has an academic conflict, the class periods have been shortened due to an assembly or other reason, or the majority of your students will be on a field trip, then your school may use any day in the week (seven days) after the official competition date. The AMC 8 should be given officially on the first day that the school has available testing time.

Please note that because the competition may be given officially up to seven days after the official competition date, you must collect the students' competition booklets and instruct them not to discuss the competition questions and solutions outside of the group that took the AMC 8 together until after the end of the competition window.

Unofficial administration: The exam can be offered unofficially after the official administration timeframe has ended. Answer sheets will be scored but results will be considered unofficial. Be sure to mark the exceptions box at the bottom of the [Certification Form](#) as indicated when submitting answer sheets. The last date to take the competition unofficially is December 9, 2016.

Students with Accommodation Plans (e.g., for Visual or Learning Disabilities): The AMC 8 time limit for students who are visually impaired or learning disabled is 70 minutes. A teacher or a school administrator may read the questions to the student and mark the answers as directed by the student. The braille and large print exams must be ordered no later than three weeks prior to the exam date. It is the responsibility of the school and the competition manager to make arrangements consistent with the student's accommodation plan. Please contact AMC at amcinfo@maa.org for more information.

Competition Proctoring

- The proctoring of any AMC 8 should be by a teacher (preferably a mathematics teacher) or administrator at the school; a college or university teacher of mathematics, or a responsible adult who is a math club or team coach, and not related to any of the participants.
- The proctoring of the competition must take place in a public building, (i.e., school library, college or university, church, etc.).
- All students must take the competition at the same time, either in one group or in separate classrooms and be under the supervision of a proctor.
- The proctor should not be related to any of the participants. Under no circumstances may a parent proctor for their child.

Questionable Scores: If it is clear to the competition manager from personal observation that a student has cheated, then the competition manager must disqualify the student. If the competition manager receives an accusation or obtains indirect evidence of cheating, then the manager must hold back the student's paper and immediately report all the facts of the situation to the AMC Director, who in conjunction with the Committee on AMC, will determine what to do. UNDER NO CIRCUMSTANCES may the school decide on its own to accept a questionable score.

Refund/Credit Policy: If your school is unable to take the competition, please use the materials as practice sets for preparation for next year or as supplemental classroom materials. Do not return the exam materials. WE CANNOT GIVE REFUNDS OR CREDITS AFTER THE COMPETITION MATERIALS ARE SHIPPED.

**GOOD LUCK TO YOUR STUDENTS
ON THE MAA AMC 8!**
We hope they find the competition
challenging and exciting and is a
FIRST STEP TOWARDS
a future in analytical thinking
