

# MAA American Mathematics Competitions

# AMC 10 & AMC 12

# TEACHER'S MANUAL

A guide for administering a successful and rewarding AMC 10 and AMC 12 Competition



**COMPETITION DATES: WEDNESDAY, FEBRUARY 7, 2018  
AND/OR THURSDAY, FEBRUARY 15, 2018**



**MAA AMC**  
*American Mathematics Competitions*

Mathematical Association of America  
PO Box 471 Annapolis Junction, MD 20701  
**800-527-3690 • [maa.org/amc](http://maa.org/amc)**

## WELCOME TO THE COMPETITION THE 19TH AMC 10 - AND - THE 69TH AMC 12

### What is the MAA AMC Program?

The Mathematical Association of America 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 MAA American Mathematics Competitions are a series of examinations and accompanying curriculum materials that develop problem-solving skills and mathematical knowledge in middle and high school students.

### What are the AMC 10 and AMC 12?

The AMC 10 and AMC 12 are 25-question, 75-minute, multiple choice examinations in high school mathematics designed to develop students' problem-solving skills and interest in mathematics.

### When are the AMC 10 and AMC 12?

The A version of each examination is administered around the country on Wednesday, February 7, 2018 and the B version of each examination is administered on Thursday, February 15, 2018.

### AMC 10 and AMC 12, A and B Dates:

There are two versions of each competition offered: AMC 10 A and AMC 10 B, AMC 12 A, and AMC 12 B. There are some overlapping questions on the AMC 10 and AMC 12, so if a school offers both competitions on the scheduled day, they must be given at the same time. Additionally, a student may only take one competition per competition date. Students are permitted to take the A version of any competition and the B version of any competition if they meet the age and grade requirements. For example, a student can take the AMC 10 A and AMC 12 B, or the AMC 10 A and AMC 10 B. However, that student may not take the AMC 10 A and AMC 12 A. Your school can register for all four competitions, which can be helpful for providing an alternative date for students.

### Why host the AMC 10 and AMC 12?

- The AMC 10 and AMC 12 help high school students develop positive attitudes towards analytical thinking, a skill that is highly valued by universities and employers. The AMC 10 and AMC 12 connect classroom skills to unique problem-solving challenges in a fun, yet challenging manner.
- College admissions offices love to see evidence of problem-solving skills in their applicants. The AMC competitions provide students with an opportunity to demonstrate these skills in a low-stress, friendly environment.
- Over 1 million additional STEM graduates will be needed by 2022 to meet the growing demands of the labor market. The AMC 10 and AMC 12 can help your students identify an interest in and prepare them for future STEM careers.
- The AMC 10 and AMC 12 are the first in a series of competitions that lead all the way to the International Mathematical Olympiad. Students with top scores on the AMC 10 or AMC 12, may be invited to take the American Invitational Mathematics Examination (AIME). High scorers on the AIME will be invited to participate in the USA Mathematical Olympiad.

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TO FILL THE GROWING DEMANDS  
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# Pre-Exam Preparation

## How do you prepare students?

The best way to prepare students for the MAA American Mathematics Competitions is to practice creative, analytical thinking throughout the year. Schools involved with the MAA AMC often have year-round activities connected to special classes, math clubs, or other extra-curricular groups. Individual students can benefit greatly from practicing math problems from past MAA AMC exams. The MAA AMC offers a [variety of resources](#) designed to improve the problem-solving skills of students.

## Who is eligible to participate?

Students with a passion for problem-solving who are in grade 10 or below and under 17.5 years of age on the day of the competition are eligible to participate in the AMC 10. Students in grade 12 or below and under 19.5 years of age on the day of the competition are eligible to participate in the AMC 12.

## Benefits for Teachers

Teachers and competition managers who register their school for the AMC 10 or AMC 12 exam receive a complimentary [K-12 Teacher Membership](#) to the Mathematical Association of America. The membership benefits for you and your classroom include:

- Access to the [MAA Curriculum Inspirations project](#), which provides free video and print materials, based on past AMC questions designed to help educators teach students creative problem-solving 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 mathematics.
- Digital resources sent to your inbox throughout the year. These include MAA AMC program updates, practice problems, classroom tips and the latest math news.
- A subscription to Math Horizons, a quarterly digital magazine with articles, problems, contests, student research profiles, career ideas, and book reviews.
- A subscription to MAA FOCUS, a bi-monthly digital newsmagazine full of ideas about mathematics and the mathematics community.

## Pre-exam checklist for AMC 10 and AMC 12:

- Have students pre-fill all name and demographic information on their answer sheet prior to the competition day. Students must use their full legal name, no nicknames or abbreviations. They should pay careful attention to marking their name and address accurately. Failure to do so could disqualify their results or cause delays in scoring. The most common errors are filling in more than one circle in a column, not completely filling in the circles, or failing to use a #2 pencil. The MAA AMC program office will not edit the information provided on the answer sheets.
- Reserve a quiet room for at least 1 hour and 45 minutes on the day of the competition to allow time for pre- and post-competition activities.
- Review the rules on the AMC 10/12 Competition Certification Form that is included with the AMC 10 and AMC 12 competition materials.
- The day before the competition, remind students of the time and location of the AMC 10 and AMC 12.
- Obtain a supply of #2 pencils 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 10 or AMC 12 questions require the use of a calculator.

## Guidelines for Administering the Competition:

- The competition is administered by a competition manager. This person is a teacher or coach and must be an adult who is not related to any of the participants. Under no circumstances may a parent.
- The competition must take place in a public building, (e.g., schools, universities, and places of worship).
- All students must take the competition at the same time, either in one group or in separate classrooms. Each group of students must be under the supervision of a competition manager or an adult who fully understands the responsibilities and is not related to any of the students.

# Competition Day

## 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.
- Make sure they set appropriate goals for themselves so that the competition is a positive experience for every student. For new students, getting even a few questions correct is an accomplishment.
- Set aside post-competition class time for discussion of solutions, and inform students that they will get the chance to discuss the problems during the following week.

## Before the exam

**Do not open the exam bundles until one hour before the start of the competition.**

- Seat students so they are separated by an empty space, if possible.
- Hand out the answer sheets with the students' pre-filled name and demographic information and provide a #2 pencil with a good eraser to each student.
- Open the exam bundles, hand out the AMC 10 or AMC 12 competition booklets and inform students that they are not to open the competition booklet containing the problems until instructed to do so.
- Instruct students to read the entire front cover of the AMC 10 or AMC 12 competition booklet. Allow 3 minutes for students to review the front cover.
- Remind students that six points are given for a correct answer, 0 points for an incorrect answer and 1.5 points for an answer left blank. Students should consider this scoring system when they decide whether or not to guess on a question.
- Tell the students to be **AS CERTAIN AS POSSIBLE OF THEIR ANSWERS BEFORE THEY MARK THE ANSWER SHEET**. Sheets that contain stray marks may not be read correctly by the scanner that scores the competition.
- Ask if there are any questions about the competition 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 the students to open the competition booklet. Remind them to be careful to match their answers to the corresponding problem.
- Remind students that there are 25 problems and that they have 75 minutes to complete the competition. Then tell them to **BEGIN**.

## During the exam

- Provide as quiet an environment as possible.
- Participants should be continuously monitored by the competition manager during the competition.
- Be sure that no student has access to any electronic devices, including calculators and cellphones, during the competition.
- Warn any students whose eyes wander, and disqualify any students that are clearly copying answers or collaborating.
- Make an announcement to the students when there are 30 minutes left and again when there are 5 minutes left.
- When time is up after 75 minutes, tell the students to **STOP** and have them sign their name in the space provided at the top of the answer sheet. Collect the answer sheets and competition booklets as quickly as possible.
- Inform the students that the competition and solutions may not be discussed with anyone outside of the room either orally or digitally (e.g. email, online, and social media of any type) until 24 hours have passed from the official competition date. The competition booklets must be collected from the students immediately after the competition, but they may be returned 24 hours after the competition period is over.



# Competition Day

## After the exam

- **Please do not score the answer sheets.** Send them to the MAA AMC for scoring.
- Check each student answer sheet for complete and correct name and demographic information. Any incomplete or incorrect information could result in incorrect reporting of student information on the AMC Historical Statistics webpage.
- Arrange the answer sheets by section (if applicable) and organize them so that each sheet faces the same direction with the same side up. Remove all paper clips, rubber bands, and note paper attached to answer sheets. Make sure that no two sheets are stuck together.
- Place no more than 200 sheets in one report envelope. Do not return blank sheets or sheets you do not wish to be scored.
- Complete the [Competition Certification Form](#), and ask your principal or person with comparable title to sign and complete their section of the form.
- Place the School ID Form on top of the answer sheets and insert them into the report envelope. Place the [Competition Certification Form](#) in the AMC 10/12 report envelope with the answer sheets and seal the envelope. Return the report envelope to the MAA AMC office the day after competition administration. Ship with appropriate postage using a trackable method. FedEx or UPS strongly recommended. The MAA AMC is not responsible for lost or delayed answer sheets. **February 17, 2018** is the last day that AMC 10 A and AMC 12 A answer sheets will be accepted by the MAA AMC office for scoring. **February 22, 2018** is the last day that AMC 10 B and AMC 12 B answer sheets will be accepted by the MAA AMC office for scoring.
- AMC 10 and AMC 12 answer sheets submitted for scoring will not be returned to your school.
- Indicate the total number of report envelopes you are shipping to the MAA AMC office in the space provided on each envelope.
- After you have mailed all of your report envelopes, 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. It is important that no one discusses problems and solutions in any online or public forum.

## AMC Toolkit:

### Results and Resources for Competition Managers

Score reports will be emailed to competition managers as part of the AMC Toolkit: Results and Resources for Competition Managers as soon as the answer sheets are scored. If you do not receive your results via email from the MAA AMC program within 30 days of administering the AMC 10 and AMC 12, please contact the MAA AMC at [amcinfo@maa.org](mailto:amcinfo@maa.org) to verify that your answer sheets were received.

Please retain the digital score report for future reference. Many students cite these scores on applications to college and other programs. The MAA AMC cannot look up individual student scores after the competition cycle has been completed.

The AMC Toolkit is also a valuable resource for your classroom. You can use it to:

- Access your students' results.
- Find resources for problem-solving lessons.
- Explore MAA's [Top Ten Problem-Solving Strategies](#) to find videos and essays that bring excitement to mathematics learning and thinking.
- Download and print fillable PDF certificates to recognize student participation and high scores on the AMC 10 and AMC 12. Please note that the MAA AMC has discontinued distribution of pins and physical awards for students.

Please add [amcinfo@maa.org](mailto:amcinfo@maa.org) to your list of approved email contacts so that you receive important emails.

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**SCORE REPORTS WILL BE EMAILED TO  
COMPETITION MANAGERS AS SOON AS  
THE ANSWER SHEETS  
ARE SCORED.**

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# Invitational Competitions

## American Invitational Mathematics Examination

The American Invitational Mathematics Examination (AIME) is an invitational exam for the top performers on the AMC 10 and AMC 12. It is an honor to be invited to take the exam, which can lead to being selected to the US International Mathematical Olympiad team. The main date of this exam (the AIME I) is March 6, 2018, with an alternative date (AIME II) of March 21, 2018. Unlike with the A and B versions of the AMC 10 and AMC 12 exams, students can only take one AIME exam. Please ensure that you are able to proctor one of these days in the event that a student qualifies for the exam.

**AIME Qualification:** Qualification parameters depend on the results of the AMC 10 and AMC 12 competitions. For each AMC 10, at least the top 2.5% of all scorers on each version are invited, and for the AMC 12, at least the top 5% of all scorers on each version are invited. The reason for this difference is to include the top younger students, while making sure that the AIME is an appropriate experience for all invited. A cut off score will be announced for each exam based on the distribution of scores.

**AIME Preparation:** The AIME has a different format than the AMC 10 and AMC 12: the AIME is 3 hours instead of 75 minutes, all answers are 3-digit integers instead of multiple choice, and there are 15 problems instead of 25. If you have students who are first-time AIME qualifiers, show them the [MAA AMC resource page](#) so that they can familiarize themselves with the types of problem on the AIME.

**AIME Administration:** The materials needed to host the AIME on March 6 or 21, 2018 are included in your AMC 10 and AMC 12 competition materials. Please do not discard the AIME materials, even if your school has not had AIME qualifiers in the past. For both AIME exams, the competition problems will be emailed to competition managers rather than mailed like the AMC 10 and AMC 12 competition booklets. For more information about how to administer the AIME I or AIME II, please read the [Invitational Competitions Teacher's Manual](#).

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**The AIME I is March 6, 2018,**  
with an alternate date (AIME II) of March 21, 2018

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**AIME Location:** Students must take the AIME at the same competition location where they took the AMC 10 or AMC 12 whenever possible. This is to ensure that a student's AMC 10/12 score can be matched with their AIME score for USA Mathematical Olympiad qualification. In the event that a student absolutely cannot take the AIME at the same competition location, they are to make arrangements with a different competition manager who has the materials to proctor the exam and complete the [Change of Venue Form](#). Students that need to take the AIME at a different venue should reach out to nearby schools listed on the [Additional Competition Locations](#) webpage.

## United States of America Mathematical Olympiad and Junior Mathematical Olympiad

The United States of America Mathematical Olympiad (USAMO) and Junior Mathematical Olympiad (USAJMO) are each two-day, nine-hour, proof-based examinations. Those who took the AMC 12 and AIME are eligible for the USAMO and those who took the AMC 10 and AIME are eligible for the USAJMO. Each year approximately 500 students are chosen for the two Olympiads based on a combination of AIME results and AMC 10 or AMC 12 results. For more information about exam qualification and administration details, please read our [Invitational Competitions Teacher's Manual](#).

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Materials to host the AIME on March 6 or 21, 2018  
**ARE INCLUDED WITH YOUR AMC 10 AND AMC 12  
EXAMINATION MATERIALS  
IN CASE YOUR STUDENTS' SCORES  
qualify them for AIME participation.  
PLEASE DO NOT DISCARD  
THE AIME MATERIALS,  
even if your school has not had  
any AIME qualifiers in the past.**  
For either exam date, the competition problems  
will be emailed to competition managers  
rather than mailed like the AMC 10 and AMC 12.

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# AMC Policies

**Policy for Changes:** The MAA Committee on the American Mathematics Competitions may 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:** Early administration is NEVER permitted and will result in DISQUALIFICATION of all scores from your school. Early administration jeopardizes the validity of all scores from other schools.

**Official administration:** The only official day for the AMC 10 A and AMC 12 A is February 7, 2018 and the only official day for the AMC 10 B and AMC 12 B is February 15, 2018. Only official participants are eligible to qualify for the AIME. Please note that if you are taking the competition in a time zone outside of the continental US, that the competition must start after 9AM EST on the official competition day.

**Unofficial administration:** The competition can be administered unofficially after the official administration timeframe has ended. Answer sheets will be scored but the results will be unofficial and will not count towards AIME qualification. The last day for unofficial administration for both versions of the competitions is February 27, 2018. If the competition was administered unofficially, mark the exceptions box at the top of the second page of the [AMC 10/12 Competitions Certification Form](#) as indicated when submitting answer sheets.

**Refund/Credit Policy:** If your school is unable to take the competition, please use the materials as resources to prepare for next year's competition or as supplemental classroom materials. Do not return the competition materials. WE CANNOT GIVE REFUNDS OR CREDITS AFTER THE COMPETITION MATERIALS HAVE BEEN SHIPPED.

**Students with Accommodation Plans:** The time limit for students who require accommodations (e.g., for physical and learning disabilities) is 2 hours for the AMC 10 and AMC 12. A teacher or school administrator may read the questions to the student and mark the answers as directed by the student. Braille and large print exams must be ordered no later than three weeks prior to the competition date. It is the responsibility of the school and the competition manager to make arrangements consistent with the student's accommodation plan. Please contact MAA AMC at [amcinfo@maa.org](mailto:amcinfo@maa.org) for more information.

**Questionable Scores:** If it is clear to the competition manager from personal observation that a student has cheated, then the competition manager must disqualify that student. If the competition manager receives an accusation or obtains indirect evidence of cheating, then the competition manager must withhold the student's paper and immediately report all the facts of the situation to the MAA AMC Office at [amchq@maa.org](mailto:amchq@maa.org). The MAA AMC Director, in conjunction with the MAA Committee on American Mathematics Competitions, will determine what to do. UNDER NO CIRCUMSTANCES may the school decide on its own to accept a questionable score.

**Inclement Weather and School Cancellation Policy:** If school is cancelled on the day of the AMC 10 A and AMC 12 A, the competition manager must contact AMC customer service immediately ([amcinfo@maa.org](mailto:amcinfo@maa.org)) so the school can register for the AMC 10 B or AMC 12 B. If school is cancelled on the day of the AMC 10 B or AMC 12 B, the school can administer the competition unofficially at a later date, but the students will not be eligible to qualify for the AIME. In the event of a school closure, the competitions can be offered at a different location if, and only if it is administered by the competition manager who originally registered for the competition and has received prior approval by the school administrator.

AMC 10 A and AMC 12 A - February 7, 2018	
January 12, 2018	Final day to order additional AMC 10/12 A bundles for participating institutions located in Canada, Alaska, Puerto Rico, Hawaii, Guam, and the Northern Mariana Islands.
January 26, 2018	Final day to order additional AMC 10/12 A bundles for participating institutions located within the continental United States.
February 6, 2018	Have students pre-fill all name and demographic information on answer sheets.
<b>February 7, 2018</b>	<b>Official AMC 10 A and AMC 12 A competition date.</b>
February 8, 2018	Return answer sheets to the MAA AMC office the day after the competition. Ship with appropriate postage using a trackable method. FedEx or UPS strongly recommended.
February 17, 2018	Last day that AMC 10/12 A answer sheets will be accepted by the MAA AMC office for scoring.

AMC 10 B and AMC 12 B - February 15, 2018	
January 19, 2018	Final day to order additional AMC 10/12 B bundles for participating institutions located in Canada, Alaska, Puerto Rico, Hawaii, Guam, and the Northern Mariana Islands.
February 2, 2018	Final day to order additional AMC 10/12 B bundles for participating institutions located within the continental United States.
February 14, 2018	Have students pre-fill all name and demographic information on answer sheets.
<b>February 15, 2018</b>	<b>Official AMC 10 B and AMC 12 B competition date.</b>
February 16, 2018	Return answer sheets to the MAA AMC office the day after the competition. Ship with appropriate postage using a trackable method. FedEx or UPS strongly recommended.
February 22, 2018	Last day that AMC 10/12 B answer sheets will be accepted by the MAA AMC office for scoring.