

Preparing For USAMO? Here are some tips you might want to know

Introduction

USAMO, a two-day nine-hour math examination of candidates from the United States Of America and Canada, decides the eligibility to participate in the prestigious MOSP as well as form the most prestigious United States IMO team.

What is USAMO?

USAMO, the United States Of America Mathematical Olympiad, is an annual super-selective high school competition for mathematics.

The third and final test in a series decides who would represent the United States at the International Mathematics Olympiad (IMO).

History Of USAMO

Nura D. Turner was trying to constitute an American team for the IMO but had very little support.

In 1971, she published an article, 'Why can't we have a USA Mathematical Olympiad?' in the American Mathematical Monthly that generated a positive response from the MAA's National Contest Committee. It not only revived the Olympiad Sub-committee but also voted to start a USAMO in 1971 itself.

Very soon, the first USAMO was conducted on May 9, 1972. Since its inception in 1972, It has been serving as the final round for the AMC series of contests.

The United States sent the first team to IMO in 1974, and they bagged the second position.

The earlier ones had just 5 questions to be done in 3 hours, later extended to three and a half hours.

In 1996 the format changed to two 3-question 3-hour sessions with a one-hour break in between. In 2002, the format changed once again.

The American Mathematics Competitions (AMC) administers the USAMO while the Art of Problem Solving (AoPS) sponsors it. Recently the participants of USAMO have expanded from 250 to 500.

The Present Format of USAMO

The top five hundred, the brightest, and the best students from the United States Of America and Canada are invited to the USAMO.

It is an invitation-only, proof-type examination. AMC10, AMC12, and AIME scores decide the qualification for the USAMO.

It is spread over two days with a 4.5-hour session each day to solve 3 questions per session. So, it is a nine-hour examination in total, in which the usage of a calculator is not allowed.

All six questions can be solved using pre-calculus methods, but an extensive understanding of the material and creative thinking is essential to performing well.

The USAMO Curriculum

To crack USAMO, the candidate needs to have a thorough knowledge of number theory, algebra, geometry, combinatorics, probability, induction, and proof by contradiction.

Considerable experience in solving highly challenging problems and writing proofs is needed to perform well in USAMO.

How to prepare for USAMO



A. BOOKS:

- The Art of Solving Problems Book - AoPS textbooks
- Prealgebra - Mathcounts, MOEMS
- Introduction to Algebra - Mathcounts, AMC 8
- Introduction to Number Theory - Mathcounts, AMC 8, AMC 10, AMC 12, AIME
- Introduction to Geometry - Mathcounts, AMC 8, AMC 10, AMC 12, AIME, HMMT
- Introduction to Counting & Probability - Mathcounts, AMC 8, AMC 10, AMC 12, AIME

- Intermediate Algebra - AMC 10, AMC 12, AIME, USAMO, HMMT
- Intermediate Counting & Probability - AMC 12, AIME, HMMT, USAMO
- Precalculus - AMC 12, AIME, USAMO
- Calculus - HMMT, Putnam
- Art and Craft of Problem Solving by Paul Zeitz
- Problem-Solving Strategies by Arthur Engel
- Geometry Revisited by H.S.M. Coxeter & Samuel L. Greitzer
- 102 Combinatorial Problems by Titu Andreescu & Zuming Feng
- 103 Trigonometry Problems by Titu Andreescu & Zuming Feng
- 104 Number Theory Problems by Titu Andreescu & Zuming Feng
- Euclidean Geometry in Math Olympiads by Evan Chen

B. Master Problem Solving Skills

Do lots of problems, try doing problems just above your reach or the present ability, identify which parts of the solution are the main ideas, and are routine details.

C. A Lot Of Practice

Old practice problems and the previous years' contests, with solutions, may help the candidates practice according to the examination structure. Therefore, the best first step is just to double the amount of practice that you are already doing.

D. Summer Programs

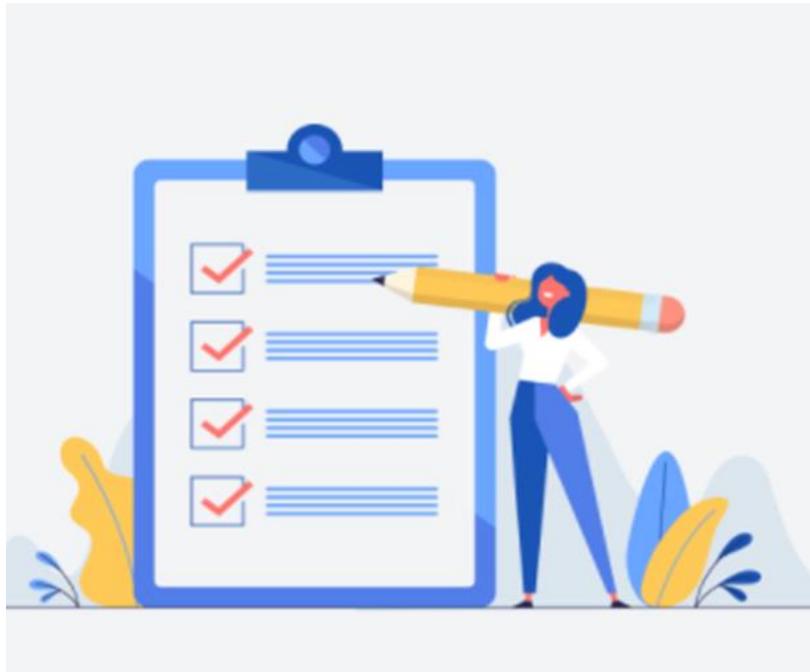
MSPs or Mathematics summer programs are available for various age groups and can be made full use to enhance lateral thinking skills.

E. Memorization Techniques

- Learn general first and specific later.
- Repetition is key to easy memorization.
- Relate steps to something funny.
- Teach someone else.

F. Optimal Strategy

- Focus on the proofs as you have had quite less exposure in this area till high school.
- Write the proofs to practice more.
- Take help or feedback on your solutions or proofs from a mentor or forum.
- Reflection is important. After solving and getting fee to depend some time on the back just go back and reflect on your methodology, weaknesses, and strengths.



G. Presentation Techniques

- Every problem should be labeled on its page (or multiple pages).
- Diagrams should be very large, often taking up half the page.
- Mistakes should be simply "struck out" rather than scribbled out or halfheartedly erased.
- The final answer on each page should be boxed for easy reference later.

H. Enjoy Solving Problems

- Don't cram
- Don't panic; take it in your stride.
- Just relax a day before the contest.

USAMO Preparation Classes

- An online school hosted by Art of Problem Solving conducts WOOT- the Worldwide Online Olympiad Training program. This program is specially designed to help USAMO, NMO, and IMO aspirants.
- Math-Jams are also conducted free of cost by Art Of problem-Solving (AoPS). Some of these Math-Jams are exclusively devoted to USAMO problems discussions.

USAMO Scoring

USAMO scores depend on the response's accuracy, completion quotient, and clarity of solution.

Each answer is awarded between 0 to 7 points. If all the responses can clear the mark on all the above-said parameters, then a total maximum score of 42 points can be achieved.

It is not surprising to find many single-digit scorers as the high school students have limited exposure to proofs and the difficulty level takes a manifold leap from AIME to USAMO.

The prestigious awards ceremony in Washington, D.C. sees only top twelve scorers, though only six out of these get selected to form the US IMO team.

These twelve top scorers and a few more top scorers are then invited to participate in the MOSP - a 3-4 week Challenging Math Olympiad Summer Program.



Summary

One of the most prestigious awards for the United States high school students, the USAMO, churns out the brightest students of the country, and qualifying for the same makes the Top-6 eligible for the team representing the United States at the IMO- the International Math Olympiad.