



Your Guide to Math Contests

2026-2027



AoPS

Art of Problem Solving

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Overview

**Math contests can feel like a lot.
Good thing you're holding a guide.**

Inside you'll find step-by-step advice:

- ★ Contest Calendars
- ★ Resources
- ★ Everything you need to understand what math competitions can offer



Spoiler: it's much more than a medal.



The true reward is helping students develop the **confidence**, **creativity**, and **problem-solving** instincts they'll carry into every new challenge that comes their way.

We'll show you how.

Title page images courtesy of MATHCOUNTS®

RESOURCES



To access all the links and resources in this document, scan the QR code below.



Should Your Child Participate in Math Contests?

MORE THAN A SCORE

Math contests nurture the ability to **solve complex problems** while developing analytical skills that serve students well in any field. This capacity for creative problem-solving is one of the most compelling reasons to participate.

While some students may dislike competition or the aspect of being timed, there is a larger perspective that should be considered: **the problems in math contests are what make the pursuit worthwhile**. So even if your student doesn't want to compete, the problems in and of themselves are captivating if it's a well-designed contest.

This guide focuses on the major national contests and provides context for why and how to participate. To dive deeper into whether competition is right for your student, read our article [The Pros and Cons of Math Competitions](#).

FINDING THE RIGHT FIT

Not all math contests are created equal. We encourage you and your child to look at the problems for any contest they're considering. Different contests emphasize different types of mathematical thinking: some focus on **creative insight**, others on **computational skill**, still others on **proof-writing**. Choose tried and true contests, such as those curated in this guide, that spark your child's curiosity.

Beyond the problems themselves, contests bring together students who share a **love of mathematical thinking**. For many young problem-solvers, finding peers who get excited about the same challenges can be transformative.



1



LEVEL 4C SAMPLE PROBLEM:

I had a multiple of 4 written down, but **Clod** came along and erased some of the numbers! This is what I have remaining:

3, _47, 2 _2

How many different possibilities are there for the number I wrote?

What Contests Offer Beyond Competition

1

Filling the Discrete Math Gap

2

Building Problem-Solving Resilience

3

Creating Community

1

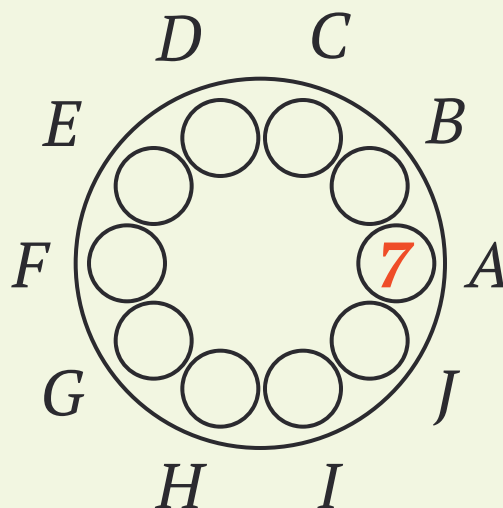
FILLING THE DISCRETE MATH GAP

Traditional American school pathways emphasize algebra, geometry, and a race to calculus ([Don't Fall Into the Calculus Trap](#)), but give minimal attention to discrete mathematics. Topics like counting and probability, number theory, logic, and graph theory are important, yet they're largely absent from standard curricula because they don't appear on state assessments or college entrance exams.

Contest preparation naturally fills this gap. Students working toward quality competitions engage deeply with discrete math concepts, developing flexible mathematical reasoning rather than memorizing procedures. Learn more in our article [Why is Discrete Math Important?](#)

DISCRETE MATH SAMPLE PROBLEM:

Representatives from ten countries are sitting around a circular table. The countries have agreed that everyone will have exactly one more or one less dinner roll than each of their neighbors. If the Arendelle representative has **\$7\$ dinner rolls**, how many different ways are there to give the other representatives rolls so that the agreement is satisfied?



2

2

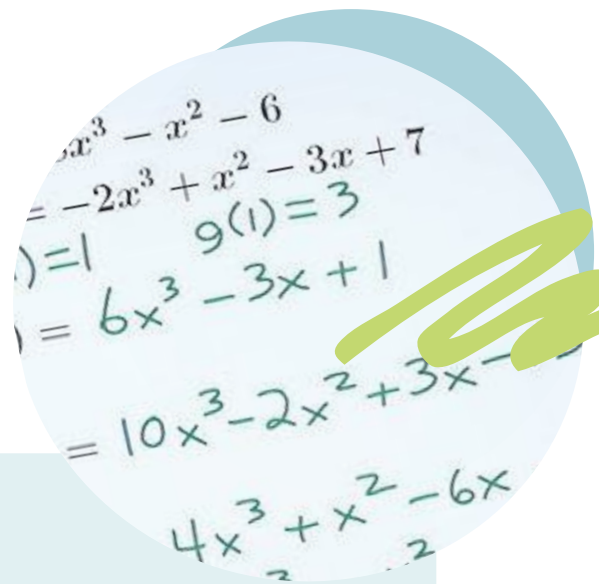
BUILDING PROBLEM-SOLVING RESILIENCE

Good math contests present creative, multi-step problems that require genuine reasoning. This is fundamentally different from the one-step exercises so common in traditional worksheets. Working through challenging problems trains the brain to approach unfamiliar situations, persist through difficulty, and develop new neural pathways for analytical thinking.

In a rapidly shifting world where adaptability matters more than memorization, this kind of cognitive training is invaluable. Students learn not just mathematical content, they also learn how to think by breaking down complex problems, testing different approaches, learning from mistakes, and ultimately reaching solutions. These are transferable skills that prepare students for any field requiring creative problem-solving, not just mathematics.

Further, students should be challenged, but not frustrated. Well-designed contests have a range of problems: easier problems will provide students who are new to contests more confidence to progress, and harder problems will challenge students who have more fluency and contest experience.

At every level of mathematics, learning to communicate your reasoning clearly is essential. See [How to Write a Solution](#) for guidance on writing solutions that effectively convey your mathematical thinking.



For insights on developing mathematical fluency, see:

- [Why It's So Important to Learn a Problem-Solving Approach to Mathematics](#)
- [How to Work Through Hard Math Problems](#)
- [Stop Making Silly Mistakes](#)

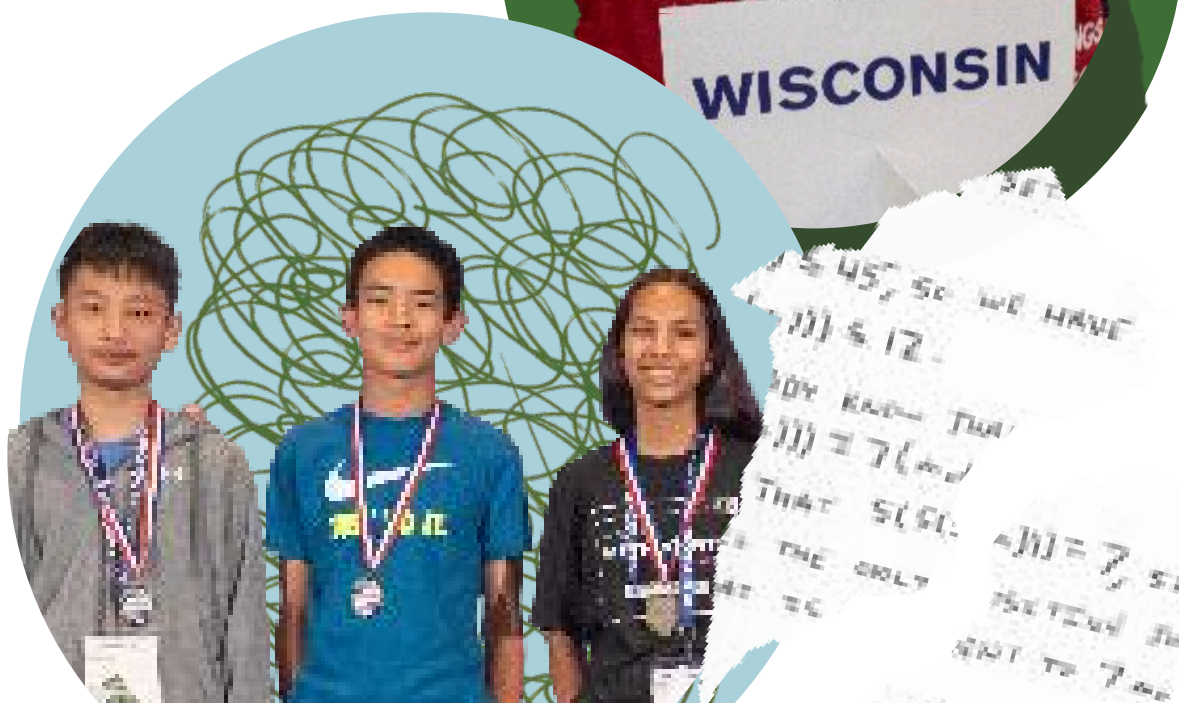


3 CREATING COMMUNITY

Perhaps most importantly, contests bring together students with shared interests and abilities. For students who may be one of only a few in their school pursuing math seriously, contests provide friendships, inspiration, and encouragement in ways the typical classroom cannot.

“These competitions bring together students of like interests and abilities, allowing them to form their own community in which they will find **friendship**, **inspiration**, and **encouragement** to a far greater degree than most of these students can find in the typical classroom.”

— Richard Rusczyk
AoPS Founder



Images courtesy of
MATHCOUNTS®



Curated Contest Calendar at a Glance 2026-2027

Color Key:

Grades 6-8

Grades 9-12

Multiple Grades

SEPT

USAMTS

Three rounds throughout the year, first round in early September.

NOV

AMC 10/12

MOEMS

MATHCOUNTS

School Competition

USAMTS

DEC

MATHCOUNTS

School Competition

MOEMS

JAN

AMC 8

MOEMS

FEB

AIME

MOEMS

MATHCOUNTS

Chapter Competition

MAR

MATHCOUNTS

State Competition

USA(J)MO

MOEMS

Math Kangaroo

MAY

MATHCOUNTS

National Competition

Looking for more? If you are interested in exploring additional contests, please scan the QR code.



Math Contests: A Curated Guide

This is not an exhaustive list; there are many excellent regional and specialized competitions (HMMT, ARML, and others). We've focused on the major national contests that form the core competition pathway and consistently feature **high-quality, thought-provoking problems**.

CONTESTS STARTING AT ELEMENTARY LEVEL



MATH KANGAROO

Grades 1-12

Mid-March

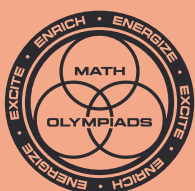
International

International competition emphasizing logical thinking and creative problem-solving.

75 minutes, 24-30 multiple-choice questions depending on grade.

Why it's distinctive: Accessible entry point; problems emphasize pattern recognition and creative insight over computation

Register at mathkangaroo.org



MOEMS

(Mathematical Olympiads for Elementary and Middle Schools)

Grades 4-8

November-March

International

Five monthly team contests, 30 minutes each, 5 problems per contest.

Why it's distinctive: Emphasizes multiple solution strategies; builds collaborative problem-solving; consistent monthly practice.

School-based registration at moems.org

Color Key:

Grades 6-8

Grades 9-12

Multiple Grades



CONTESTS FOR MIDDLE SCHOOL TO HIGH SCHOOL



MATHCOUNTS

Grades 6-8

Fall-Spring

U.S. Only

School, Chapter, State, and National Levels

Four-round format: Sprint, Target, Team, Countdown

Why it's distinctive: In-person format facilitates building math community. Structured progression from school to national competition; strong discrete math emphasis (coaches dedicate ~50% of prep time to counting and probability); team component builds collaboration alongside individual achievement

Register at mathcounts.org



AMC 8

(American Mathematics Competitions)

Grades 8 and below

Late January

International

International only through [International Group Leaders](https://www.igls.org/) (IGLs)
Must be under 14.5 years old

25 multiple-choice questions, 40 minutes

Why it's distinctive: Well-designed problems that reward creative thinking; provides younger students with their first AMC style challenge before the high school level contests, which are the qualifying exams for the invitational level.

School-based registration or at test centers at [maa.org](https://www.maa.org)



CONTESTS AT HIGH SCHOOL LEVEL

**USAMTS**

(USA Mathematical Talent Search)

Grades 6-12

Early September+

U.S. Only

Three rounds (first begins early September).

5 problems per round: the first is a puzzle and the rest are proof-based problems⁹, one month to solve each round.

Why it's distinctive: Extended time format removes speed pressure; requires written mathematical justification; students receive personalized feedback from graders; excellent for developing proof-writing skills.

Individual registration at usamts.org

**AMC 10/12**

(American Mathematics Competitions)

Grades 9-12

Early-Mid November

International

International only through [International Group Leaders](#) (IGLs).

American Mathematics Competitions (AMC) 10/12: 25 multiple-choice questions, 75 minutes.

Two versions (A and B) about one week apart; students may take both.

Why they're distinctive: Gateway to AIME and olympiads, but excellent contests in their own right; problems reward mathematical insight and elegant reasoning; AMC 10 covers through 10th grade plus discrete math; AMC 12 covers full high school curriculum excluding calculus.

School-based registration or testing centers at maa.org

Color Key:

Grades 6-8

Grades 9-12

Multiple Grades

CONTESTS AT HIGH SCHOOL LEVEL

**AIME**

(American Invitational Mathematics Examination)

Top AMC 10/12 performers

Early February

International

International only through [International Group Leaders](#) (IGLs).

15 questions, 3 hours; short answer.

Invitation only (automatic for qualifiers).

Why it's distinctive: Problems require deeper discrete math understanding; combined AMC + AIME scores determine USA(J)MO qualification.

**USA(J)MO**

(USA Junior Mathematical Olympiad/ USA Mathematical Olympiad)

Top AIME performers

Late March

U.S. Only

6 proof-based problems over 2 days (9 hours total).

USAJMO is for students who qualified through their AMC 10 + AIME scores; USAMO is for students who qualified through their AMC 12 + AIME scores.

Why they're distinctive: Most prestigious U.S. high school math competitions; require rigorous mathematical proof; top scorers invited to Mathematical Olympiad Program (MOP) summer camp; pathway to the International Mathematical Olympiad (IMO).

Color Key:

Grades 6-8

Grades 9-12

Multiple Grades

CONTESTS AT HIGH SCHOOL LEVEL

**IMO**

(International Mathematical Olympiad)

Top USA(J)MO performers

July 2027

6 proof-based problems over 2 days.

Six-member U.S. team selected from top performers at MOP.

Why it's distinctive: Oldest and most prestigious international mathematics competition; represents the pinnacle of high school mathematical achievement.

Can't Take Contests at Your School?

If your school doesn't host these contests, consider these options:



AoPS Academy campuses that teach on-site classes offer these contests to students enrolled in AoPS courses across our platforms (space is limited, first-come first-served). Check with your local campus at aopsacademy.org to see what contests they offer.



Advocate with your school to become a testing center. Many contests make this straightforward for schools willing to coordinate.



For homeschoolers: There are avenues to participate in contests: check individual contest websites for specific registration options and requirements.





What Makes AoPS Training Different?

Art of Problem Solving builds courses across many subjects, but our foundation is in the world of **math contests**.

The first AoPS textbook was designed in response to the Mandelbrot Competition, a contest co-founded in 1990 by Sam Vandervelde, Sandor Lehoczky, and AoPS founder Richard Rusczyk. Recognizing the need for better contest training materials, in 1993-94 Richard and Sandor wrote the two-volume Art of Problem Solving books. These books were used for a decade by top contest students, and in 2003 became the foundation for launching the AoPS website.

Since then, AoPS has expanded into a comprehensive program spanning elementary through olympiad levels, offered through self-paced courses, online classes, in-person academies, and weekend seminars.



Images courtesy of
MATHCOUNTS®

“What drew us to Art of Problem Solving was how engaging the material and videos are, and how they push students to think deeply instead of rushing to answers. My child enjoys challenges that require **reasoning** and **creativity**, and AoPS creates an environment where thinking, questioning, and problem-solving are central to learning.

— Parent Webinar Survey Response





What Makes AoPS Training Different?



PROVEN TRACK RECORD

In the last 11 years, USA IMO team members have won 65 medals and collectively taken over 380 AoPS Online courses. Art of Problem Solving is a trusted name with top universities and math associations.



EXPERT CURRICULUM AND INSTRUCTION

Our curriculum is designed by mathematicians with deep competition experience, former USAMO and IMO participants, MOP veterans, and experienced competitors who understand firsthand what it takes to succeed at the highest levels. This expertise is built into every course, from elementary through olympiad, taught by our experienced, highly credentialed instructors.



COMPREHENSIVE TRAINING ACROSS ALL CONTEST TOPICS

We offer everything students need for contest success in one place. Our curriculum includes dedicated courses in the discrete math topics essential for competitions, **counting** and **probability**, **number theory**, and **logic**, that are largely absent from traditional school curricula. These topics are also woven throughout our core courses, ensuring students develop deep facility with contest mathematics at every level.



PROBLEM-BASED LEARNING PHILOSOPHY

Like quality contests themselves, AoPS curriculum emphasizes multi-step problems requiring creativity and critical thinking, not one-step exercises. This develops genuine mathematical reasoning that serves students in competitions and far beyond, training them to think flexibly and approach unfamiliar challenges with confidence.

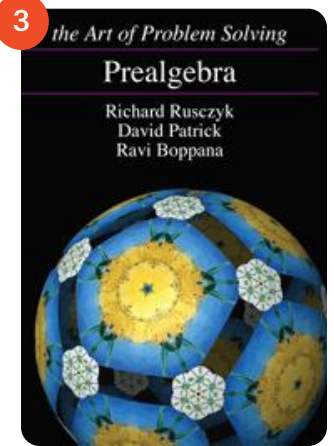




Training Pathways by Contest Level

RESOURCES FOR MOEMS + MATH KANGAROO

Grades 1+



1

Beast Academy (Grades 2-5): Comic-book style curriculum building problem-solving instincts from day one - utilize our beautifully illustrated books and/or interactive platform

2

AoPS Academy/Virtual Campus: In-person or video-based classes and summer camps

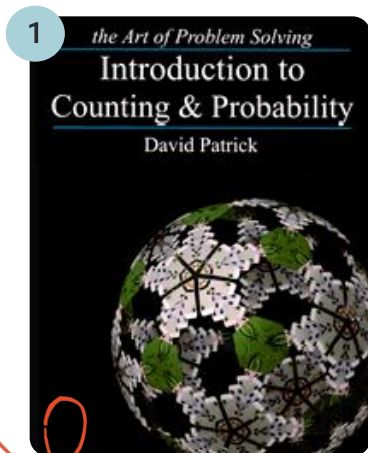
3

AoPS Prealgebra: For strong students in grades 6-8



RESOURCES FOR MATHCOUNTS + AMC 8

Grades 6-8



1

Core Curriculum (Textbooks):

The Art of Problem Solving, Volume 1: the Basics, Prealgebra, Introduction to Algebra, Introduction to Counting & Probability, Introduction to Number Theory, Introduction to Geometry

Competition Math for Middle School

2

Contest Prep at AoPS Academy and AoPS Academy Virtual Campus: AMC 8/MATHCOUNTS Comprehensive Training and contest summer camps

3

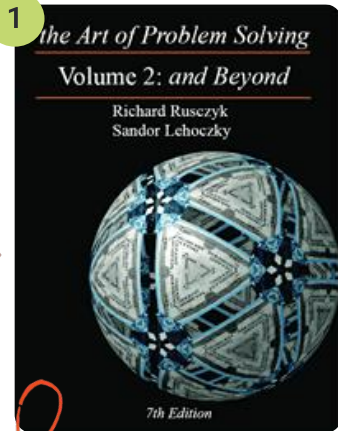
Contest Prep At AoPS Online (text and image based platform):

- AMC 8/MATHCOUNTS Basics (for students new to competitions)
- AMC 8/MATHCOUNTS Advanced (for students scoring 15+ on AMC 8 or 25+ on MATHCOUNTS Chapter)
- Special AMC 8 Problem Seminars A & B (intensive weekend workshops)



RESOURCES FOR AMC 10/12 AND AIME

Grades 9+

**Core Curriculum (Textbooks):**

Introduction to Geometry, Intermediate Algebra, Intermediate Counting & Probability, Precalculus, Calculus

1

The Art of Problem Solving, Volume 2: and Beyond

2

Contest Prep at AoPS Academy and AoPS Academy Virtual Campus: AMC 10/12 Comprehensive Training and contest summer camps

3

Contest Prep At AoPS Online (text and image based platform):

- AMC 10 Problem Series (for students scoring 60+ on AMC 10)
- AMC 10 Final Fives (for students scoring 80+ on the AMC 10)
- Special AMC 10 Problem Seminars A & B (intensive weekend workshops)
- AMC 12 Problem Series (for students scoring 60+ on AMC 12)
- AMC 12 Final Fives (for students scoring 80+ on the AMC 12)
- Special AMC 12 Problem Seminars A & B (intensive weekend workshops)
- AIME Problem Series A & B
- Special AIME Seminars A & B (intensive weekend workshops)



RESOURCES FOR USA(J)MO AND IMO

Grades 9+

1



2



3



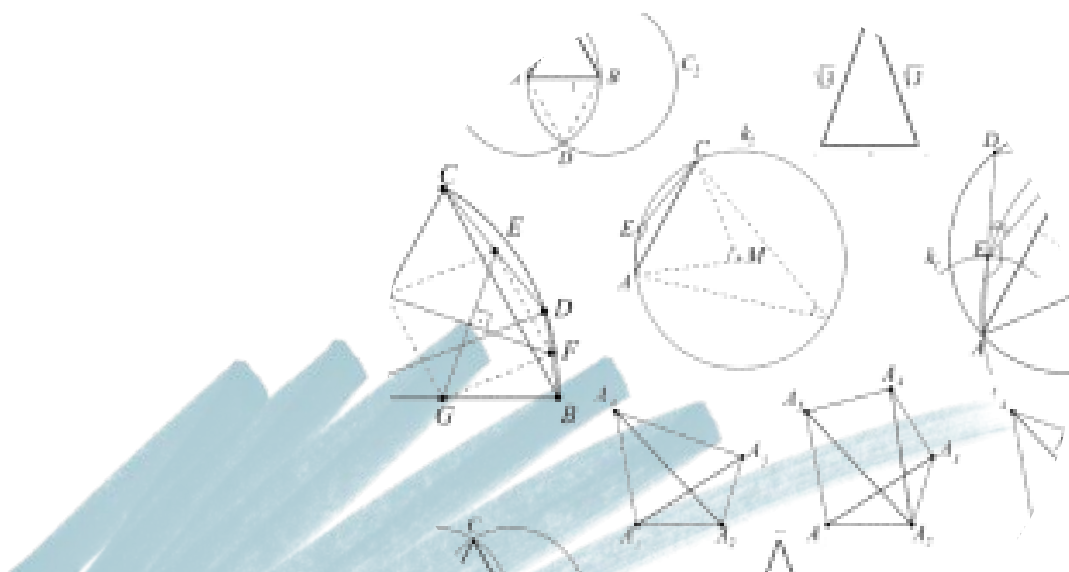
1

MathWOOT (Worldwide Online Olympiad Training): Year-round preparation with two levels (Level 1 for students scoring 5-9 on AIME; Level 2 for students scoring 9+ on AIME)

2

Olympiad Geometry (proof-based advanced geometry)

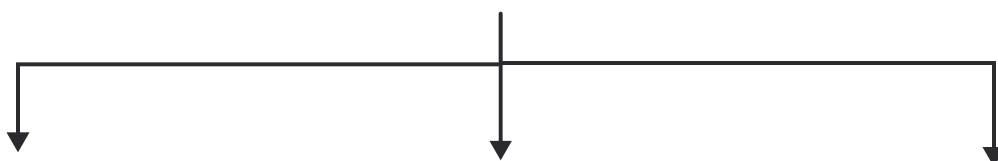
Our olympiad program is led by former USAMO and IMO participants, as well as Mathematical Olympiad Program (MOP) veterans.





Your Personalized Training Plan

IF YOUR STUDENT IS...



New to Contests

1

Choose a first contest that fits their grade level.

2

Explore the AoPS course map for insights on your student's long-term path

3

Begin with core curriculum to build foundation before contest prep courses

4

Practice regularly using free resources listed below such as [Alcumus](#)

Already Competing

1

Assess current level by recent contest scores

2

Fill knowledge gaps with subject courses (Counting, Number Theory, Geometry)

3

Add targeted contest prep courses for specific competitions

4

Join the AoPS Community to discuss problems with peers

Aiming for Top Performance

1

Complete the core curriculum through Precalculus

2

Take both A and B versions of contest prep courses

3

Participate in weekend seminars for intensive training

4

Consider MathWOOT if consistently scoring 5+ on AIME





Free AoPS Resources

- ★ [For The Win!](#): Competition-style game using real MATHCOUNTS and AMC problems
- ★ [MATHCOUNTS Trainer](#): Practice tool for MATHCOUNTS preparation
- ★ [Alcumus](#): Adaptive problem-solving system
- ★ [AoPS Community](#): Discussion forums with thousands of past contest problems
- ★ [Contest Collections](#): Organized archives of major competitions
- ★ [AoPS Wiki](#): Comprehensive contest information



Your Next Steps

