



Preparing for Change: The 2024-25 Math League Season

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Tips for Coaching Success

- I'll start with some resources I'm aware of
- We'll end with a group discussion
- Please share your ideas; you are the experts!

But first ...

- Any additional questions on the new meet format and topics list (yesterday's session?)

Coaching Resource #1: Your Middle School!

- MATHCOUNTS, AMC 8, and MNJHML are terrific preparation for Math League
- e.g. MNJHML shares a similar format and introduces many of the same topics:

2024-25 MSHSML Topics

A - Algebra	B - Geometry & Trigonometry	C - Counting, Probability & Statistics, Number Theory
1A 1. Decimals, Fractions, and Percents 2. One Variable Linear Equations & Inequalities 3. Exponent Rules 4. Square Roots and Radicals	1B 1. Angles & Angle Relationships 2. Triangle Similarity and Congruence 3. Analytic Geometry of a Straight Line 4. Trigonometry Basics	1C 1. Basic Counting 2. Statistical Measures 3. Prime Factorization & Divisibility Rules 4. GCD and LCM
2A 1. Systems of Linear Equations 2. Binomials and Quadratics 3. Absolute Value 4. The Logarithm	2B 1. Area, Perimeter, and Lengths in Triangles 2. Right Triangles 3. Analytic Geometry of Points and Lines 4. More Elementary Trigonometry	2C 1. Counting Permutations and Independent Events 2. Analyzing Data 3. Basic Probability 4. Base n Arithmetic
3A 1. The Quadratic Formula 2. Polynomials 3. Arithmetic Sequences & Series 4. Complex Number Arithmetic	3B 1. Area, Perimeter, and Lengths in Quadrilaterals & Polygons 2. Problem Solving involving Triangles, Quadrilaterals and Polygons 3. Transformations in the Plane 4. Trigonometric Identities	3C 1. Counting Combinations 2. More Probability 3. Pascal's Triangle and the Binomial Theorem 4. Calculating Digits, especially the Last Digit
4A 1. Optimization Problems 2. Roots of Polynomial Equations 3. Geometric Sequences & Series 4. More Logarithms & Exponents	4B 1. Area, Perimeter, Angles in Circles 2. Lengths involving Circles 3. Analytic Geometry of Circles 4. Law of Sines & Law of Cosines	4C 1. More Counting & Probability 2. Expected Value 3. Remainders & Modular Arithmetic 4. Finding Integer Solutions
5A 1. Non-Linear Equations and Systems of Equations 2. Functional Equations 3. Sums of Powers of Integers 4. General Sequences & Series	5B 1. 3-Dimensional Geometry 2. Geometry Problem Solving 3. Analytic Geometry of Conic Sections 4. Geometry of Complex Numbers	5C 1. Divisor Arithmetic 2. Venn Diagrams & the Principle of Inclusion-Exclusion 3. Geometric Probability 4. More Integer Solutions

Notes:

- Problems may draw on topics from any previous meet.
- Logic or puzzle type problems may appear in any event throughout the season.

Coaching Resource #2: Sample Meets

- I've created curated sample meets with the new topics, from (mostly) old MSHSML problems
- 10 sample meets (two each for Meets 1 - 5)
- Answer keys and past performance

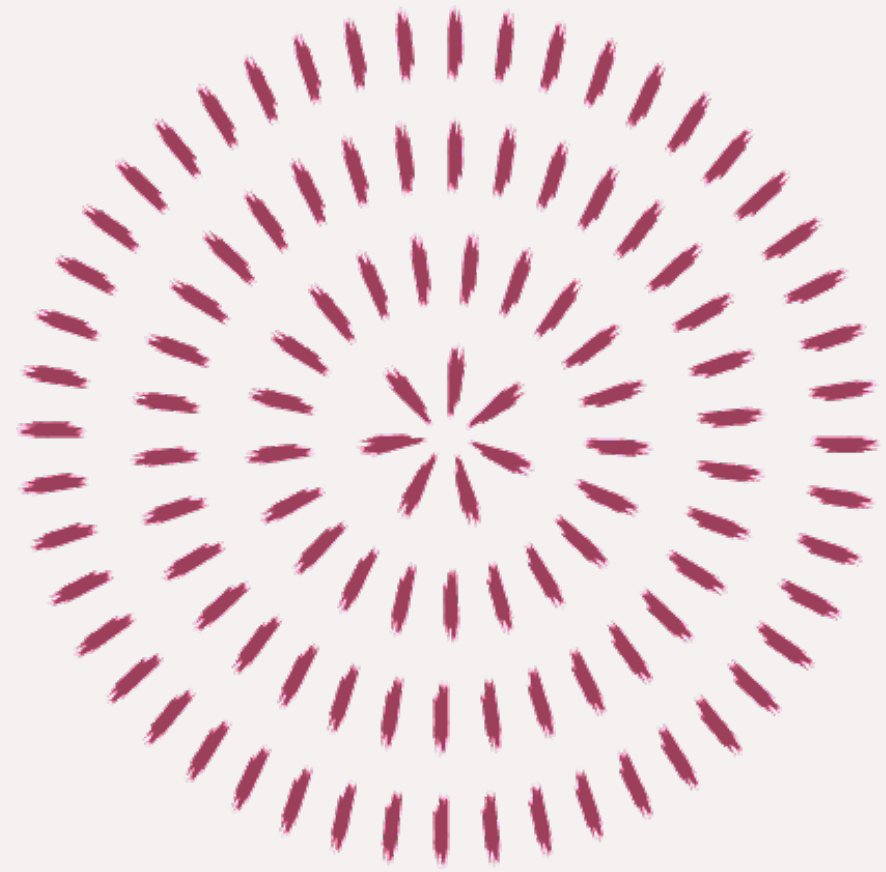
Coaching Resource #2: Sample Meets



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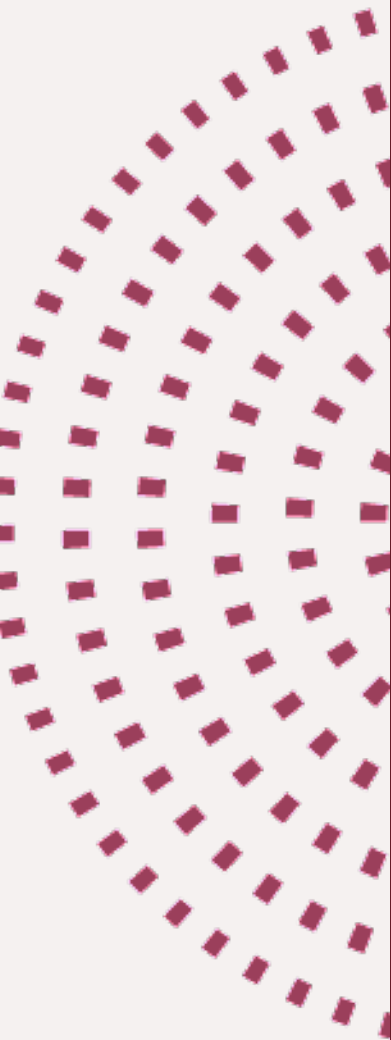
Coaching Resource #2: Sample Meets

- Sample meets don't include written solutions
- But ... solutions are (almost) all on the MSHSML website
- <https://www.mnmathleague.org/login.php>



HINT!!!

- For 2024-25, at least one problem on each Meet will be nearly identical to a problem from the corresponding .1 Sample Meet



Coaching Resource #3: Event Builder

- Gary went through this yesterday

Coaching Resource #4: Alcumus

- Most of our topics are aligned with Alcumus
- Free resource from the Art of Problem Solving

aops.com/alcumus

Alcumus

Alcumus is Art of Problem Solving's Innovative Online Learning System!

Alcumus offers students a customized learning experience, adjusting to student performance to deliver appropriate problems and lessons. Alcumus is specifically designed to provide high-performing students with a challenging curriculum appropriate to their abilities.

Ready to start? Click PLAY.
Or, read the **HELP** menu.

PLAY



Over 13,000 Problems with Solutions

Many of the problems are from major national math competitions such as MATHCOUNTS, MOEMS, the American Mathematics Competitions, and the Centre for Education in Mathematics and Computing competitions.



An Intelligent Learning System

As the student gets stronger, Alcumus automatically provides more challenging material, and conversely, if the student is having difficulty with a particular topic, Alcumus provides additional practice.



Detailed Progress Reports

Students can track their performance in various subjects and revisit problems and lessons at any time.



Tools for Teachers

Our Teacher Tools allow teachers to monitor their students' progress. Click [here](#) to sign up.

TEACHER SIGN-UP

Coaching Resource #4: Alcumus

- Spreadsheet mapping of our topics to Alcumus:



bit.ly/3W9cXK8

Other Coaching Resources

- What other resources do you use?
- Tips for successful practices?
- How will your practices change this year?

Thank you!

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- Slides and materials at this link —> bit.ly/3Ltjjiv

