



## A message from the Executive Director, Tom Young

A Happy Thanksgiving to all! I hope you have safe travels and enjoy the company of family and friends.

I want to give a shout out to the Polar Division schools (Barnum, Carlton, East Central, Esko, and Moose Lake) for a well-run and well-attended meet 2. The coaches of these schools do a great job of recruiting students, students who are pulled in many different ways for extracurriculars. I think they have a lot of schools beat if you count percentage of student body that participate!

To accommodate the students' schedules, the Polar Division holds their meet during the school day. Innovative thinking I'd say! I have great respect for smaller schools who are able to fit Math League into their students' lives. Thanks for all you do.

**Meet 3 is coming quickly and, don't look now, the AMC 10/12 registration is due December 13<sup>th</sup>!**

## Polar Division Pictures from Meet 2



Moose Lake



East Central



Esko



Carlton



Barnum



Coaches

### A message from Tom Kilkelly, Head of the Problem Writing Team

After Meet 1 we learned that we need to take a look at the League manual and clear some things up at next year's Fall Board meeting. The following three statements seem to conflict with one another:

p.29 "students should not be penalized for omitting units in their answers."

p.27 "Angle measurements written with the degree symbol ( $^{\circ}$ ) will be in degrees. All other angle measurements will be assumed to be in radians. *This applies to both printed exams and student solutions.*" [italics added]

p.28 "It should always be remembered that the League desires to give credit to students on the basis of what they understand mathematically. The ideal would be to avoid withholding credit when a student has simply failed to observe some legalism.

*Hopefully, the league's challenge policy ensures that grading is the same in all divisions.*

Does the third statement conflict with our "determine exactly" policy? Should these words be used less often by the problem writers? Is  $2\sqrt{3}$  really a better answer than  $\sqrt{12}$ ? Is  $\frac{\sqrt{2}}{2}$  really a better answer than  $\frac{1}{\sqrt{2}}$ ? As problems writers, we often use the words "determine exactly" so that we don't have to list several equivalent answers. Lots of discussion for the next Summer coach's meeting.

At Meet 2, Problem A4, the answers  $x \leq 1$  and  $(-\infty, 1]$  were given. After challenging, five students received credit for  $-\infty < x \leq 1$ ,  $[-\infty, 1]$ , and  $< \leftarrow, 1]$  We learned the last is how it is written in Norway!

Two students noticed and challenged that Problem C3 was actually impossible as stated since  $(\frac{2}{3})^2 + (\frac{3}{4})^2 \neq 1$  and another student used  $\cos(A+B) = \frac{2}{3}$  to arrive at an alternative answer.

**Meet 3 is coming soon! Don't forget to review Ptolemy's Theorem, cis notation, Laws of Cosines (written both ways:  $c^2 =$  and  $\cos C =$ ), and Laws of Logarithms.**

### More pix from meet 2 from Polar Division



## Fundraising Committee Report:

The League is always looking for sponsors who can help us with our mission. If you know of a company that we should contact, or know a person in a company that we should contact, email suggestions to Luke Olson at [lolson@sspps.org](mailto:lolson@sspps.org)

### Some in-kind suggestions

**Web site:** our web site could use a new look and be streamlined better

**Mentors/tutors:** Local participating schools would welcome mentors/tutors for mathletes

**Career counseling:** mathletes would benefit from Career counseling

### Monetary contribution suggestions

**State-wide Transportation Fund:** Increasingly, schools find busing costs to be onerous. Donations to a state-wide Transportation Fund for financially burdened schools would help keep schools in the League.

**T-shirts:** local schools often create T-shirts and might welcome a sponsor. We also sell T-shirts for the State Tournament. Sponsors could add their logo to the shirts, perhaps.

**Calculators:** we allow any calculator for competition purposes. Some calculators have more functionality. Some local schools would welcome an update of their calculators.

**Fees for students:** students pay participation fees at schools; sponsor could defray that cost.

**Food at Meets and at State Tournament:** we have a luncheon with awards at the state tournament. Divisions have end of season banquets and meet treats.

**All State Math team competitions:** each year, we take All-Stars from Minnesota to several college and national competitions. We charge the students for transportation, room, and board.

**Summer Math Institute:** each year, we develop a summer camp for 40 – 50 students. We charge \$600 to cover the costs of teachers, room, and board. Hopefully we can reach more students if the price is better.

**The Wayne Roberts Scholarship fund:** This fund provides grants to students to enroll in mathematical camps/seminars. Each year we try to increase the amount in the fund.

**Summer Coaches Conference:** each year, we put on a Summer Coaches Conference to help train our coaches. Often, we bring in a guest speaker to help coaches increase the depth of their mathematical knowledge. A sponsor could help pay for the speaker or help with the cost of the social event.

**Sponsorship of the League, in general**

**Do you have other ideas? Send them to Tom Young at [tyoung@district16.org](mailto:tyoung@district16.org)**

## Division Coordinators News

We appreciate your feedback! Please keep using the online scoring system to send comments and suggestions. We take them to heart. Also, update your student counts so we can send you the correct number of tests!

Also, look for an updated League Manual soon.

## Summer Coaches Conference 2020:

Many activities are being planned, including Hall of Fame Induction and Alumni gathering. If you know of alumni who might be interested, send us contact information.



# The Roberts Award Scholarship

The Roberts Award Scholarship(s) were established in honor of the League founder, Dr. Wayne Roberts of Macalester College.

The Scholarship(s) are offered to help offset the costs for students interested in attending an out-of-state math opportunity. They are offered once each year. A set amount of funds will be available each year, and multiple awards are possible.

**Deadline to apply for this season is April 30, 2020**

Applications can be found on our web site at: [http://mnmathleague.org/?page\\_id=1033](http://mnmathleague.org/?page_id=1033)

## AMC 10 and 12 Competitions coming sooner than usual!

The MN State HS Math League will **NOT** be offering the AMC 10 and AMC 12 due to financial constraints. Make sure your school signs you up. The AMC 10/12 A is Thursday, **January 30, 2020** and the AMC 10/12 B is Wednesday, **February 5, 2020**.

## Don't Forget to enter this Contest!

**There's money to be made! Calling all schools to produce a 90 second video explaining why you like to be involved in the Math League. Student interviews, teacher endorsements, sample problems, or video of practices/meets are all possible components of such a video. Videos are due to the League Office ([mathleague@augsborg.edu](mailto:mathleague@augsborg.edu)) by March 1<sup>st</sup>, 2020. Videos must be sent by, and approved by, the school math team coach. A committee will decide the winners and the winning videos will be shown at the State Tournament.**

First prize: \$200 to the math team at winning school  
Second Prize: \$150 to the math team at 2<sup>nd</sup> place school  
Third Prize: \$100 to the math team at 3<sup>rd</sup> place school

## And Don't Forget this Contest!!

State Meet T – shirt Design Contest returning!

Each year, the league provides t-shirts for sale to the tournament participants. Do you want to design the t-shirt for the 2020 State Tournament?

***If so, the one-color design should include these words: "MN State High School Math League", "State Tournament", and "March 9, 2020".***

Your **one-color design** should be emailed to [mathleague@augsborg.edu](mailto:mathleague@augsborg.edu) in pdf file format by February 7th, 2020. Include name, grade, and school in your email submission. Winner will be notified by February 14th, 2020. The prize? A \$50 VISA gift card

## Problem Corner

an effort to spur conversation

If you'd like to contribute a problem or send in a solution, email [tyoung@district16.org](mailto:tyoung@district16.org)

Student solutions encouraged!

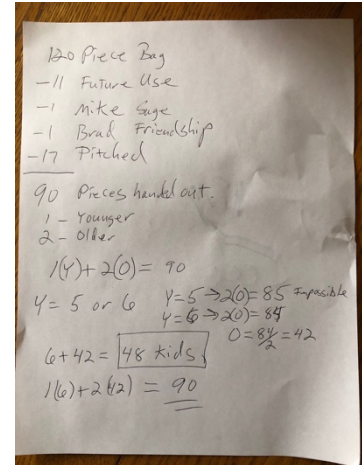
Newsletter #15 Puzzler

How many kids came to my door Halloween night?

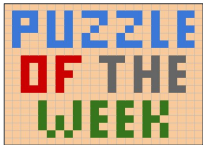
Solution

Sent in by David Sternal

48 kids



New Puzzler: this from <http://www.puzzleoftheweek.com/puzzle-library>



Entries open: 24/06/19

Entries close: 30/06/19



puzzle number

101

Bob writes the numbers 1 to 6 in a grid like the one on the right.

He then multiplies together every pair of adjacent numbers.

Finally, he adds up all seven of the answers he has made.

2	↔	3	↔	5
↕		↕		↕
6	↔	1	↔	4

In this example Bob's total was 66.

He then moves the numbers around and tries again.

$$\begin{array}{l} 2 \times 3 = 6 \\ 3 \times 5 = 15 \\ 2 \times 6 = 12 \\ 3 \times 1 = 3 \\ 5 \times 4 = 20 \\ 6 \times 1 = 6 \\ 1 \times 4 = 4 \end{array} \rightarrow 66$$

### What is the largest total Bob can make?

**Extension:** What is the lowest total Bob can make?

**Extension<sup>2</sup>:** What if Bob tried using the numbers 1 to 8 in a 2x4 grid?

@asharpeducator

Puzzle created by Bob Vertes, author of "Fun Maths: Games and Puzzles" published by the Association of Teachers of Mathematics (ATM).

[www.puzzleoftheweek.com](http://www.puzzleoftheweek.com)