Math League News

■ **Use the Internet to View Scores or Send Comments** to comments@mathleague.com.

■ **Contest Registration and Books of Past Contests** Register for next year by mail or on the internet right now! Renew now so you don't forget later! *You may ask us to bill you this fall.* We sponsor an *Algebra Course I Contest* and contests for grades 4, 5, 6, 7, and 8. Use the registration form enclosed with Contest #6 to register for contests or to **Order Books of Past Contests**.

■ **2017-2018 Contest Dates** We schedule the six contests to be held four weeks apart (mostly) and to end in March. Next year's contest (and alternate) dates, all Tuesdays, are October 17 (Oct. 24), November 14 (Nov. 21), December 12 (Dec. 19), January 9 (Jan. 16), February 13 (Feb. 20), and March 20 (Mar. 27). Have a testing or other conflict? Now is a good time to put an alternate date on calendar!

■ **Test Security Procedures** Students are expected to sign the honor pledge posted on our website, affirming that they "will neither give nor receive help with any of the Math League Contest questions either before or during any of the Math League Contests." Of course, in the end contest security is really a cooperative effort. Schools should do whatever they can to prevent premature disclosure of questions and/or answers. For our part, we are always monitoring the results for any suspicious outcomes, which we then investigate thoroughly.

■ **End-of-Year Awards and Certificates** Symbols identify winners. We ship plaques to the advisors. Errors? Write to *Math Plaques, P.O. Box 17, Tenafly, NJ 07670-0017.* Identify the award, contest level, your name, and the school's name and address. The envelope for Contest #5 contained Certificates of Merit for the highest scoring students overall and in each grade for the year. Do you need extra certificates for ties? If so, send a **self-addressed, stamped envelope large enough to hold certificates (you need to use *TRIPLE* postage)** to *Certificates, P.O. Box 17, Tenafly, NJ 07670-0017.* (Please allow one week.)

■ **General Comments About the Contest (and the Year)** Ed Groth said, "As always, thanks for a terrific year of challenges (even for the math teachers!)." Jon Graetz said, "Good contest, despite no use of pi (on pi day!)." Timothy Smith said, "Thanks for another great year of math." Looking forward to next year." Tin Baumgartner said "Thank you for another fascinating year's worth of contest questions! We were all surprised, however, that there was no mention of pi on this pi day contest." Chip Rollinson said, "Thanks again for another year of fun questions."

■ **Question 6-3: Altrnate Solution:** Ed Groth discussed the following method with his students: Completing the square, one can get $(a - b)^2 = -ab$. In such a case, the only real solution occurs when $ab = 0$. Hence, a = b. Therefore, (0,0) becomes the only real solution.

■ **Question 6-4: Corrected Solution** Both Lynda Wyse and Connie Rose-Mulder noted an error in our solution to this question. Lynda Wyse wrote, "Several of my students answered Problem 6-4 as the ratio of 1:2, area of shaded:area of unshaded. The question is asked as the ratio of the shaded to the hexagon, which to me means my students would be wrong. But the solution explanation is worded "the ratio of the shaded to that of the unshaded is 1/3. Please clarify." Thank you both for pointing this out to us. None of our proofreaders noticed that the last sentence of our solution was incorrect. Of course, we should have written ". . . the ratio of the shaded area to the area of the hexagon is 1/3." Although our last sentence misstated the areas involved, the answer we gave was correct.

■ **Question 6-5: Alternate Solution** Edward Groth noted that "This can be solved using the double-angle formula for tan 2ϕ. The angle bisector creates a small triangle whose legs are 1 and 2, making tan ϕ = 1/2. Solving for tan 2ϕ = 2 tan $\phi/(1 - \tan^2\phi)$ = $(x + 1)/2$, we can derive the same value of x = 8/3." One of Denes Jakob's students proposed a similar alternate solution.

■ **Question 6-6: Comment** Edward Groth said "I loved the fact that question 6, though very challenging, was solvable using algebra and pre-algebra skills, so that any creative student in 9-12 could have derived the solution. Unfortunately, none of my students got there, though a handful made terrific strides towards a solution (one had forgotten that 51 was not prime, another simply doubled 49, and another added 53 to 50)."

■ **Sixth Annual International Summer Tournament** Our Sixth Math League International Tournament will be held again this summer at The College of New Jersey. We are dividing the program into two sections this year: From July 15th through July 19th, we will hold our program for elementary school students in grades 4 and 5. From July 25th through July 30th, we will hold our program for middle school and high school students in grades 6, 7, 8, and 9. Students from China, Canada, South Korea, and the United States will participate in these tournaments. Last year we had speakers from Princeton University, Columbia University, Williams College, and many other notable schools. Any student in grade 9 or below who has a cumulative total of 30 points or higher on our six high school contests is eligible to apply. In addition, any student in grade 9 or lower who receives a score of 27 or higher on our Algebra 1 contest may apply to our program. Also, any student in grades 6, 7, or 8 who received a score of 31 or higher on the contests for those grade levels is eligible to apply. If any of your qualified students are interested in this program, please have them write to dan@mathleague.com.

Statistics / Contest #6
Prob #, % Correct (*all reported scores*)

Prob #	% Correct	Prob #	% Correct
6-1	86%	6-4	52%
6-2	61%	6-5	35%
6-3	55%	6-6	19%