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**.

■ 2014-2015 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 14 (Oct. 21), November 11 (Nov. 18), December 9 (Dec. 16), January 13 (Jan. 20), February 10 (Feb. 17), and March 17 (Mar. 24). *Do you have a testing or other conflict?* If so, right now is a good time to put the alternate date on your 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) Timothy Smith said, "We really enjoyed the season. Again, I prefer easy contests like #6 early in the season to motivate kids to stay with it. Plus, it seems you want the harder ones at the end to differentiate the best kids...just my two cents. Thanks again." Tim Thayer said, "students said that this was the easiest test this year. I had 19 students out of 208 get perfect scores ~ never have my students performed this well!" James Buck said, "Students found these problems much easier (other than #6) than Contest 5." Stephen Swiniarski said, "Team consensus: Easiest of the six. Proctor's observations: Team members are finally seeing the detail of what is being asked." Andreas Evriviades said, "Please accept my sincerest thanks for another great year, your excellent problem selection, and for all you do to promote mathematics in an essentially innumerate society." Fred Harwood said, "Thanks for another fun year of problem solving during our lunch times." Linda Muratore said, "Thank you for another great year. You never disappoint."

■ Question 6-1: Comment Katherine LeDuc said, "This contest says any calculator without a qwerty keyboard is allowed. However, the TI-Nspire CAS does not have a qwerty keyboard but would give an unfair advantage to students using it for problem # 1. The students could just use the 'solve' feature of the calculator to solve this and any other algebra problem. My students did not do that but it is a concern in general." This point is well taken, but please note that we do take pains to ensure that questions that can be solved through simple calculator use are a very rare occurrence. For a question such as this one, intended to be relatively simple (and, indeed, answered correctly by 88% of participants), the use of a sophisticated calculator technique is not significantly easier than a straightforward factoring approach. It is also true that for those schools that choose to allow calculator use, and even for those that don't, the question might serve as a good starting point for a discussion of the solve feature as well as the underlying algebraic approaches.

■ Question 6-3: Appeals (Denied) Laura Estersohn appealed, saying "two of my finest students answered 36 for question 3. They felt for example, that ABCDE and EDCBA are the exact same row turned the other way. Please let me know what you think." This answer cannot be given credit. Every lineup of people has an order. Just as we distinguish between permutations and combinations, we distinguish between the front and the back of the line. This appeal was denied by Professor Brian Conrad, Stanford University Mathematics Department. Jarad Schofer and Rose Suarez each appealed for an answer of 2. As Rose said, "for question #3, a few of the kids believe it can be interpreted in 2 different ways, allowing for a 2nd possible solution. Here's what one of them wrote: 'The question doesn't specify whether or not the 3 men and 3 women are distinct people, which leads to an ambiguous question. If one interprets the question as non-distinct people, the answer becomes 2. Here's an example of this type of thinking: How many ways can you arrange 3 letter Ms and 3 letter Ws? This would lead to MWMWMW and WMWMWM where M = male and W = women.'" This answer cannot be accepted as correct. While 3 "letter Ms" might be interchangeable, 3 men (or 3 women) are not. If, for example, 6 men were in a line, would there be only one way to arrange them? To assume that there would be would trivialize the question.

■ Question 6-5: Comment Mark Dickson said, "it's worth noting that the lines are all coplanar." We believe that the use of the term "slope" requires the interpretation that the lines are coplanar. The term "slope" is generally not used for lines in space, and thus the premise of multiplying slopes to get a product of –8 has no clear meaning for lines in space.

■ Question 6-6: Comments, Appeals (Accepted), and Alternate Solution Stephen Swiniarski said, "I was surprised to see so many different forms of unsimplified but correct exact answers. Each one demonstrated a different technique to their solving process. Even those who were incorrect had some remarkable rational approximations. It was quite an educational moment." One adviser wrote in to ask, "Doesn't the $x^{[x]}$ imply that the base and the exponent have the same value? (the answer is 2?) I could buy the solution provided, were this problem written differently with two different variables." The question asked doesn't recognize that x and $[x]$ are not always equal. As explained in the question, $[x]$ denotes the greatest integer function. Joan Seitz appealed on behalf of a student, "who answered with the square root of the fourth root of 2014." Mary Ollier filed a similar appeal. Since this answer is equivalent to the official answer, the students should be given credit. One student suggested an alternate solution using substitution of 2014^y for x and then some trial and error to determine that y (which must be the reciprocal of a multiple of 4) is $\frac{1}{8}$.

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

Prob #	% Correct	Prob #	% Correct
6-1	88%	6-4	55%
6-2	85%	6-5	68%
6-3	46%	6-6	33%