Math League News

■ **Our Calculator Rule** Our contests allow both the TI-89 and HP-48. You may use any calculator without a QWERTY keyboard.

■ **Send Your Comments** to comments@mathleague.com.

■ **Contest Dates** Future HS contest dates (and alternate dates), all Tuesdays, are December 12 (Dec. 19), January 16 (Jan. 23), February 13 (Feb. 20), and March 12 (Mar. 19). (Each alternate date is the Tuesday following the official date.) For vacations, special testing days, or other *known* disruptions of the normal school day, please *give the contest on the following Tuesday*. If your scores are late, please submit a brief explanation. We reserve the right to refuse late scores lacking an explanation. We sponsor an *Algebra Course I Contest* in April, as well as annual contests for grades 4, 5, 6, 7, & 8. See *www.mathleague.com* for information.

■ **Regional Groupings** Within guidelines, we try, when possible, to honor regional grouping requests for the next school year.

■ **What Do We Print in the Newsletter?** Space permitting, we print every solution and comment we receive. We prepare the newsletter early, so we can use only what we have at that time.

■ **How Do I Change the Spelling of a Student Name?** Please note that an advisor can always return to the Score Report Center to change the spelling of a student's name or to correct a score. We stay out of the loop on such changes. Any advisor noticing a need for such changes should feel free to make them directly.

■ **Can I Add Additional Names and Scores to an Earlier Contest?** One advisor asks, "Since some students did very well in the second contest, can we add their names (with the scores) to the Contest 1 report?" We always allow adding additional names and scores to an earlier contest as long as the additions do not affect the team total previously submitted for the earlier contest.

■ **Administer This Year's Contests Online** Any school that is registered for any of our contests for the 2023-2024 school year may now register at **www.online.mathleague.com** for the 2023-2024 Online Contests at no cost. The advantages of administering the online versions of our contests rather than the paper and pencil ones are that you do not have to grade your students' papers and that you do not have to submit any scores at our Score Report Center ~ these tasks are done automatically for you when your students take our contests online. If you decide to use this free service, you must set up your account and set the day you will administer each contest at least one day in advance of the actual contest date.

■ **General Comments About the Contest** Erik Berkowitz said, "Wow ~ this one was a tough contest. And you had to be really careful reading it to make sure you were answering the right question!" Alex Freuman said, "Thanks for always cranking out such wonderful and novel questions." Roger Finnell said, "Quite (maybe too) challenging!" Chip Rollinson said, "This proved to be a challenging set of questions for my students." Josh Turner said, "Without a doubt, this was the most challenging contest I've ever seen from this competition." Robert Morewood said, "Thanks for another enjoyable problem set! Quite the challenge for us."

■ **Question 2-1: Comments and Appeals (Accepted and Rejected)** We heard from quite a number of advisers that many students found the wording of Question 2-1 difficult to parse. One extreme example was provided by Edward Groth, who said, "I don't think I've ever had a question #1 where none of my students got the correct answer. None. The wording itself confused enough people that it seems (in my opinion) to have been too difficult to have been chosen for question #1." The statistics do seem to bear this out. Several advisers appealed on behalf of alternate answers that were arrived at by considering the squares of negative integers as well as the squares of positive integers, allowing for two sides of the triangle to have equal lengths. It is definitely true that the current wording of the question allowed for the inclusion of the squares of negatives, so the appeals are, in general, well founded. Among the advisors we heard from on this issue were Kevin Cheung, Will Frazer, Alex Freuman, Jon Graetz, Denes Jakob, Peter Knapp, Robert Morewood, Anthony Palma, Thomas Picanco, Erik Potter, Tim Thayer, Garrett Turner, Matthew Weisser, and Ajay Zutshi. On the other hand, not all the alternative answers that were submitted on appeal were correct! Appeals were submitted for answers of 9, 22, 32, 34, and 50. The lowest of these, 9, is the correct answer to the question when negative integers are taken into account. As Robert Morewood said, "I also had one student who found the truly correct answer to #1: $\{1^2+2^2+(-2)^2\}$ Even I missed that, despite always telling my students that, when you see "integer", don't forget to consider negatives!" We are accepting both 9 and 77 as correct answers to this question, and we are going to add the word "positive" to this question when we publish our next book.

■ **Question 2-2: Comments** Robert Morewood said, "I really like that number 2 gave everyone a chance to get some success with a partial answer, while emphasizing the importance of reading the question!" Erik Berkowitz said, "One note on the online form for #2: Many students were confused about how to enter the ordered pairs. Looking at it, I wonder if there is a way to make the instructions clearer for something like that. (For instance, give an example?)"

■ **Question 2-3: Comment and Alternate Solution** Robert Morewood said, "There were some alternate solutions here, with students finding all three sides of the unshaded triangle and using those in various ways to find the area."

■ **Question 2-4: Comment** Erik Berkowitz said, "I liked #4, as a fun way to think about backtracking from the answer to the question."

■ **Question 2-5: Comment** Chip Rollinson said, "Problem #5 was very tricky to figure out... and answer with confidence."

■ **Question 2-6: Alternate Solution** Chip Rollinson said, "For Problem #6, one way to solve it was graphically by looking for the first place where y = floor(x/5) + floor(x/25) + floor(x/125) + floor(x/625) + floor(x/3125) intersects with y = 2023."

Statistics / Contest #2

Prob #, % Correct (*all reported scores*)

2-1	25%	2-4	36%
2-2	51%	2-5	16%
2-3	59%	2-6	9%