



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 11 (Dec. 18), January 8 (Jan. 15), February 12 (Feb. 19), and March 19 (Mar. 26). (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 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 2018-2019 school year may now register at www.online.mathleague.com for the 2018-2019 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** Denes Jakob said, "Thanks for another enjoyable contest; it always generates some great math conversations and provides some good teaching points for our math club." Ed Groth said, "Thanks as always for what you do (which is to keep us old guys on our toes as much as the kids)."

■ **Question 2-1: Comments** Several advisers wrote to tell us that the wording of Question 2-1 could have been clearer in its requirement of a numerical answer. Benjamin Dillon said, "Many - too many - of our students gave polynomial answers for the area of the square. Our best student got lost in the wording, because there really needs to be a comma after the word 'square.'" Cindy Penatzer said, "Many of my students gave [a polynomial] instead of finding a numerical answer for the area of the square." Denes Jakob said, "In Question 2-1 some of my students gave a correct algebraic expression for the area of the square. I did not give them the point for it. However I think including something about 'the numerical value' probably would have avoided this confusion."

■ **Question 2-5: Comments** Jeff Marsh said, "We had some confused students and teachers with the wording in 2-5. I think it would have been clearer if it stated 'The sum of Jan's first five RANKS was 66' or 'The sum of Jan's first five numbers' RANKS was 66.' Similar with Ann's wording of course." Ed Groth also made several suggestions for how the question might have been more clearly written, concluding that 2-5 is "A good question on set theory, just poorly worded. My opinion." In case the question and solution are still not clear, here is an illustration of the logic: suppose there were only 5 numbers in S, and they were 8, 5, 12, 4, and 7. Jan would replace each number with its rank in the sequence from smallest to largest: since 4 is the smallest, its rank is 1. The rank of 5 is 2, the rank of 7 is 3, the rank of 8 is 4 and the rank of 12 is 5. In this case, Jan's new list would be 4, 2, 5, 1, 3. Ann ranks them from highest to lowest: For her the rank of 8 is 2, the rank of 5 is 4, the rank of 12 is 1, the rank of 4 is 5, and the rank of 7 is 3. So Ann's new list is 2, 4, 1, 5, 3. Notice that the sum of corresponding numbers in these two new lists is always 6. Jan's first number is 4 and Ann's is 2; Jan's second number is 2 and Ann's is 4, etc. Next, suppose we know the sum of the first 3 numbers in Jan's list is 11. We can now find the sum of the first 3 numbers in Ann's list without looking at it. Since the sum of each pair of corresponding numbers is 6, together the sum of the first 3 numbers of both lists must be 18. Therefore, the sum of the first 3 numbers of Ann's list must be 18 - 11 = 7. Checking against what we know of Ann's list, we see that it works out: 2 + 4 + 1 = 7 as expected. Extrapolating the same logic to a sequence with 20 numbers as presented in Question 2-5, we can determine that the sum of each pair of corresponding numbers must be 21. Our solution follows from that fact..

Statistics / Contest #2			
Prob #, % Correct (all reported scores)			
2-1	59%	2-4	23%
2-2	44%	2-5	25%
2-3	91%	2-6	11%