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**.

■ **2024-2025 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 15 (Oct. 22), November 12 (Nov. 19), December 10 (Dec. 17), January 14 (Jan. 21), February 11 (Feb. 18), and March 11 (Mar. 12). Have a testing or other conflict? Now is a good time to put an 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? Email dan@mathleague.com. 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? Email dan@mathleague.com and you will be provided with a link to a printable color pdf of our Certificate of Merit.

■ **General Comments About the Contest (and the Year)** Yanli Cui said, "Thank you so much for a great year! Our math team really enjoyed the competitions in the year of 2023-2024!" Denes Jakob said, "Thank you for another great series of high school math contests; we always enjoy your fun and challenging math problems. Many of the problems generate good mathematical discussions among students and provide some excellent teaching points for our Math Club." Jim Linza said, "Thank you for running this! It is a true challenge for our kids. Much appreciated."

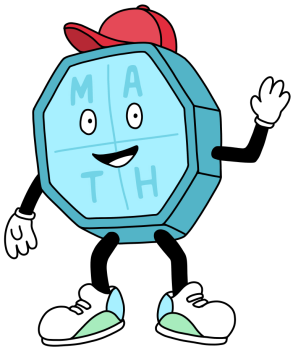
Statistics / Contest #6

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

6-1	59%	6-4	52%
6-2	66%	6-5	59%
6-3	63%	6-6	4%

■ **Question 6-4: Alternate Solution** Denes Jakob said, "A couple of my students used the change of base theorem: $\log_x y = 1/\log_y x$, and then multiplied both sides of the equation by $\log_y x$. Now, letting $t = \log_y x$ we obtain the quadratic equation: $5t^2 - 26t + 5 = 0$, solving by factoring we get $(5t - 1)(t - 5) = 0$ thus, $\log_y x = 1/5$ or $\log_y x = 5$. From here they used the same reasoning as in your solution and got the correct answers."

■ **Question 6-6: Comment** One of our advisors asked, "I was reviewing the solution for problem 6-6 in the 2024 Math League contest, and I'm curious why the difference of 2 is used in the solution: $B = b - 2$, $C = c - 4$, etc. The question states that the positive difference needs to be greater than 2 between the integers, and I had assumed it would need to be a minimum difference of 3 for the difference to exceed 2. This would yield 18 nCr 5 or 8568 as E = e - 12 with this difference. Is there a reason that the solution uses differences of 2 for that problem given the wording?" The answer lies in the logic of the solution, which creates parallel examples for each acceptable possibility. Consider examining the acceptable case with the lowest possible values by choosing 1, 4, 7, 10, and 13 as a, b, c, d, and e. By subtracting multiples of 2 from each of these numbers as suggested, we get values of 1, 2, 3, 4, and 5, which are consecutive integers, as A, B, C, D, and E. It is only because the differences between a, b, c, d, and e ARE greater than 2 that we can safely subtract the multiples of 2 and be confident that we will still have 5 distinct integers for our parallel case of A, B, C, D, and E. (In other words, note that we are not trying to get the 5 values to be equal by subtracting the key multiples of 2, we are trying to AVOID having any of the 5 values be equal while coming up with an easier parallel situation to evaluate!)



SEE YOU NEXT YEAR!!