



# 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.

■ **Use the Internet to View Scores or Send Comments** to [comments@mathleague.com](mailto:comments@mathleague.com). You can see your results at [www.mathleague.com](http://www.mathleague.com)!

■ **Dates of Final HS Contest and Algebra Contest** Our final contest of this school year is March 19 (with an alternate date of March 26). In addition, this year happens to be the 23rd year of our annual April *Algebra Course I* contest. There's still time for your school to register! Go to [www.mathleague.com](http://www.mathleague.com).

■ **2019-2020 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 7 (Jan. 14), February 11 (Feb. 18), and March 17 (Mar. 24). Have a testing or other conflict? Now is a good time to put an alternate date on calendar!

■ **Rescheduling a Contest and Submitting Results** Do you have a scheduling problem? If school closings or testing days mandate contest rescheduling, our rules permit you to use an alternate contest date. Try to give the contest the week after the regularly scheduled date. If scores are late, attach a brief explanation. Late scores unaccompanied by such an explanation will not be accepted.

■ **End-of-Year Awards** Engraving of awards begins March 27th. We give plaques to the highest-scoring school in each region and to the 2 schools and the 2 students with the highest totals in the entire League. *Winning schools must submit their results to our Internet Score Report Center by March 31st.* Results submitted later cannot be used to determine winners. A teacher once asked, "Has there been any thought to using enrollment figures to divide the schools into two divisions? Personally, I don't care whether we ever receive any team recognition, as my students enjoy the mathematical challenges provided." Our groupings are not organized to "even out" the competition. Competition is one feature of our academic enrichment activity, but enrichment should be the main goal. Only a few schools can expect to win, but all schools can profit.

■ **General Comments About Contest #5:** Chris Bolognese said, "Thank you for putting together challenging problems for our students each month. We have participated...for years and look forward to upcoming contests." Jon Graetz said, "Good contest." Tim Baumgartner said, "Thank you for another thought provoking contest. 5-1, 5-2, and 5-3 were all good ones for forcing the students to read all the clues that are there, and not assume clues that are not there!" Chip Rollinson said, "Thanks for another solid set of questions." Alex Pintilie said, "[We] have been-and will always be- HUGE FANS of the Math League. The perfect setup, perfect mix of problems, great teaching opportunity when discussing the questions in class." Andrew MacPherson said, "I greatly appreciate the quality of your problems and my students learn a lot from doing these problems. Congratulations on so many years of service...keep up the good work. I'm not sure how you guys come up with the questions, but I always enjoy them!" Dena Lordi said, "Please accept my appreciation for the Math League, our students have enjoyed it for many years." Michael Maxon said, "I enjoy taking the Math League along with my students." Chris Tillman said, "Thank you for the wonderful contest year after year. Our students at my school love it."

■ **Question 5-1: Appeals (accepted)** We heard from many advisers and even a few students about Question 5-1, appealing on behalf of answers of 792. Among those submitting appeals were Paul Allore, Scott Berger, Chris Bolognese, Benjamin Dillon, Robert Hess, Alison Langsdorf, Jeff Marsh, Mike Maxon, Jon Mormino, Cindy Penatzer, Chip Rollinson, Chris Tillman, and Brent Yen. The official answer of 891 was obtained because while the question specifies that  $N$  be a 3-digit integer, it refers to  $M$  only as the "number" that results from reversing the digits of  $N$ . In a case in which  $N$  has a units digit of 0,  $M$  (which is not explicitly required to have three digits!) would have a leading zero (or two) that would not affect the value of  $M$ . Thus, for example,  $900 - 9 = 891$ . On the other hand, if a student assumed that  $M$  must also be a three-digit integer (with no leading zero), or felt that a string of digits that starts with a leading zero cannot be considered a valid "number," then the answer that would obtain is 792, using for example  $901 - 109 = 792$ . Since so many people had this latter interpretation, we are effectively removing the question by giving everyone credit for the correct answer. This question was intended to be the easiest on the contest, and the issue regarding leading zero(s) made the problem more of a semantics issue than a math question.

■ **Question 5-2: Comment** Cindy Penatzer said, "For #2, many did not consider negative numbers."

■ **Question 5-4: Comments** We heard from many advisers and a few students about the scenario used to frame Question 5-4. Among those submitting comments were Chris Bolognese, Jon Graetz, John Hagen, Dennis Hu, James King, Anthony Lecheler, Jude Loeffler, Dena Lordi, Andy MacPherson, and Chip Rollinson. The objections raised, all of which are well taken, included that the subject matter was generally inappropriate for the context, that the approach was unenlightened, heteronormative, or generally tone-deaf, that it might be seen as encouraging boys to be polygamous, that it might be seen as a joke at the expense of a particular gender, that it is sexist or misogynistic, that it was inappropriately gender binary, and that it might encourage infidelity or disrespect in romantic relationships. We would like to apologize for the ill-advised nature of the scenario employed in the question; we take all the criticism that we received very seriously. Future published versions of the contest will use a completely different scenario with the same underlying numbers and mathematical concepts but none of the gender issues, and of course Math League will be far more careful and aware in the future to avoid any such issues on future questions. We thank you for your feedback and welcome the chance to do better in the future.

■ **Question 5-5: Comment** Tim Baumgartner said, "The property at the heart of 5-5 is not one that I had ever encountered before, although it is easily proved once it is pointed out."

| Statistics / Contest #5                 |     |     |     |
|---|-----|-----|-----|
| Prob #, % Correct (all reported scores) |     |     |     |
| 5-1                                     | —   | 5-4 | 74% |
| 5-2                                     | 38% | 5-5 | 23% |
| 5-3                                     | 74% | 5-6 | 26% |