



# 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.

■ **Our Internet Score Center** All students whose scores you report must have been tested at exactly the same time. Don't list students from any later class period. Instructions for submitting scores appear on each contest envelope. Scores you enter may be reviewed at any time by returning to the Internet Score Center. About 3 weeks after a contest, scores appear on our Web site, [www.mathleague.com](http://www.mathleague.com). Late scores must be accompanied by a brief explanation of the reason for lateness.

■ **Send Your Comments** to [comments@mathleague.com](mailto:comments@mathleague.com)

■ **Contest Dates** Future HS contest dates (and alternate dates), all Tuesdays, are Nov 15 (8), Dec 13 (6), Jan 10 (3), Feb 14 (7), & Mar 13 (6). (Each alternate date is the preceding Tuesday.) For vacations, special testing days, or other *known* disruptions of the normal school day, please *give the contest on an earlier date*. 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 1 Contest* in April, as well as contests for grades 4, 5, 6, 7, & 8. See [www.mathleague.com](http://www.mathleague.com) for information.

■ **Not Yet Received Your HS Contest Package?** Phone 1-201-568-6328 so we can reship. If you just recently got the contests, *please take Contest #1 as soon as possible, even if it's late!*

■ **Carefully Check Your Contest Package** Without opening any contest envelope, please check that the remaining envelopes are numbered 2, 3, 4, 5, and 6. If you're missing a contest envelope, e-mail [dan@mathleague.com](mailto:dan@mathleague.com) with your name, the school's name, the full school address, and the number of the contest envelope you're missing. We'll mail you another set of contests right away.

■ **Eligibility Rules** Only students officially registered as students at your school may participate. That's our rule.

■ **Authentication of Scores** To give credibility to our results, we authenticate scores high enough to win recognition. Awards indicate compliance with our rules. Please print the Selected Math League Rules (posted on the same page as this Newsletter) and have students read them and then sign them to confirm knowledge of the rules. *Keep the signed sheets. Do not send them to us unless we request authentication from you.*

■ **General Comments About the Contest** Jason Bershatsky said, "Thank you for another great contest. My students are looking forward to a new year of competitions." Mark Luce said, "An enjoyable contest, as usual, though I thought it seemed a bit easier than some of the contests from last year. One of my two students with a perfect score thought it was easy, too; he was done after 20 minutes and said he spent the last 10 minutes just checking his work, because he thought he must have done something wrong." Benjamin Wearn said, "Most of the solutions on contest 1 were by observation or enumeration of possibilities. There was essentially no elegant algebra on this contest. (Most of my students did #2 by inspection and attempted #6 by pattern searching, even #5 was more about writing out a table.) I'm a big fan of having some non-algebraic solutions, but the balance felt off on this contest. Some of my students who like to sink their brains into meaty algebra were disappointed." Dick Gibbs said, "Contest 1 seemed to be easier than usual. Maybe by design?" Chris Allen said, "We are officially [participating in] Math League again! Thanks for all your help!" Richard Serrao said, "Thanks for a great start!" Fred Harwood said, "Excellent first exam. My team was well spread out from 0 to 6 indicating a strong challenge but doable by the best. Thank you." Todd Braun said, "The first contest enabled students of all levels to experience some success. This is always appreciated and allows teachers to better promote involvement." Ed Groth said, "Good test for the first round. I was happy to see that nearly everyone in my room got at least 1 right, which is a good confidence booster, especially the freshmen who may not have seen these tests before. Thanks as always for the work you guys do." Meredith Klein said, "In the future, there should be translated tests available! I would request

Spanish, French, Chinese, Bengali, Arabic. Many of my students could have done much better with a translated test." Meredith, please keep in mind that we do allow foreign-language-to-English dictionaries to be used during the contests.

■ **Question 1-1: Comments** Mark Luce said, "I am sorry to say I had several good students who answered (0,4) for the first problem, and I had to remind them that zero is NOT a positive integer." After fielding some questions on the issue, we'd also like to remind everyone that ordered pairs involve parentheses; since the question called for a response in the form of an ordered pair, correct answers should include the requisite parentheses.

■ **Question 1-2: Appeals (Rejected)** Jung Hye appealed on behalf of a student who answered " $x = 2011$ " to this question. Since the question called for the number of acceptable values of  $x$ , and not the value of  $x$  itself, this answer cannot be given credit. Matt Biondi appealed on behalf of a student who answered the question with " $x = 1$ ." Once again, since the question did not call for a value of  $x$ , the answer cannot be given credit (even though the numerical part of the answer is correct).

■ **Question 1-4: Appeal (Accepted)** Several advisors brought to our attention a potential issue in the phrasing of question 1-4. As Jeff Marsh said, "You talk about the 'largest' right triangle in the first sentence, and then ask for the perimeter of the 'large' right triangle. They thought there was a 'small,' 'large,' and 'largest' in the diagram. Add 'st' to 'large' in the final sentence, and this is a great question, but in the meantime, should I also accept 48?" Jason Bershatsky, Tim Smith, and Kipp Johnson submitted very similar appeals as well. Under the circumstances, we agree that the question might be interpreted in a way that we did not intend. As we hope you've all seen, the following message appears at the Score Report Center: Due to an ambiguity in the use of the word "large" in question 1-4, students should receive credit for either the official answer "60" or the alternative answer "48." Please score your student papers accordingly.

■ **Question 1-5: Alternate Solution** Darrin Dobrowolski and Ed Groth each had students who recognized the Fibonacci Sequence. As Ed said, "One of my students correctly identified 55 as one of the elements of the Fibonacci Sequence (and the description of the paychecks mirrored the sequence's algorithm perfectly), and set immediately to list the terms he knew. When 55 ended up being the 10th term, the third term was easy enough to determine."

■ **Question 1-6: Comment, Appeal (Rejected), and Alternate Solution** Mark Luce said, "Problem 6 is a clever number theory problem, in my opinion." Barry Weng appealed on behalf of a student who answered " $10^6 \times 1.000$ " for this question and claimed that the answer was correct to four significant digits. Since the question called for an integer "greater than 1 million," the answer is incorrect. Dick Gibbs submitted an alternate solution, saying "I made tables of  $2^x$  and  $3^x \pmod{7}$ . The only values of  $x$  for which  $2^x + 3^x$  gave a multiple of 7 are, as you noted, the odd multiples of 3 (where  $2^x \pmod{7} = 1$  and  $3^x \pmod{7} = 6$ )."

## Statistics / Contest #1

Prob #, % Correct (all reported scores)

1-1	83%	1-4	45%
1-2	72%	1-5	53%
1-3	82%	1-6	14%