12/08

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.

■ Online Score Reports: What to Do if the Mail is Late Roughly 3 weeks after each contest, results appear on our web site, www.mathleague.com. Mailed score reports arrive after that.

■ Send Your Comments to comments@mathleague.com.

■ Contest Dates Future HS contest dates (and alternate dates), all Tuesdays, are Dec 16 (9), Jan 13 (6), Feb 24 (17), & Mar 24 (17). (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 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. Accordingly, we try to stay out of the loop on such changes. Any advisor noticing a need for such changes should feel free to make them directly.

■ Our Score Report Center David LeCount said, "This is SO much easier than it used to be, largely because of the retained name list. Thank you a million times (for all you do)." Renetta Deremer said, "WOW! This electronic entering of scores is really fast and efficient!"

■ General Comment About Contest 2 Debbie Battaglia said, "Again, a nice selection of problems. When all students can answer some questions correctly, it gives them the confidence and enthusiasm to want to continue participating." Paulette Sirakos said, "Another great contest." Sal Mucino said, "Reality check! The difficulty level was appropriate but some students felt blindsided by it. I told them 'expect the unexpected.'" Albert Roos said, "We love math!" Phyllis Dupere said, "Great contest. Allowed the younger students to show their skills." Andy Macpherson said, "Thanks for the ongoing contests and good questions. My students are enjoying this as am I." George Reuter said, "If Contest #2 is supposed to give students opportunities to get a few straightforward questions and then challenge themselves in a significant way, then you hit your mark." Ted Wardell said, "It seemed that the first 3 problems were all quite easily solved, particularly #3." Ketih Calkins said, "A confidence builder, but no 5's was a disappointment to me." Leanne Branham said, "Fun contest again." Tom North said, "Thanks for all you do ... the contest has been a great addition to our math curriculum." John Reutershan said, "I greatly enjoy your contests." James Conlee said, "Great contest!" Marc Luce said, "I thought the last two problems were very lovely; problem five a very nice algebra exercise, and problem six a beautiful geometry problem. All in all, I thought contest two was a better contest, in some ways, than contest one."

■ Problem 2-1: Comment and Alternate Solution James Conlee and Sam Lashlee point out that the question can be solved by using a graphing calculator and looking for the intersection(s) of $y = |x + 2|$ and $y = |x + 4|$. While we always want our first question to be relatively easy, some questioned whether this one was *too* easy. Lynette Quigly noted, "Questions 1 and 2 were almost too easy. Students tried to overthink them and make them harder than they were." On the other hand, Jeff Irwin said, "A little disappointed in the placement of an absolute value question as the first question on the contest. This is a topic that is barely touched in the high school curriculum and while it makes a good contest question it might be better suited to later in the contest."

■ Problem 2-3: Comment, Appeals (Accepted) and Alternate Answers We've gotten a lot of feedback on this question, and will be accepting three answers as correct: 8 (as stated in the key), 10 and 1300. Many advisors noted that the question did not specify that exact change was required. Thank you James King, Tim Baumgartner, Leanne Branham, Lisa Hagenbuch, John Reutershan, and Jeff Irwin for flagging this issue. If one counts any way of paying from the given coins that would cover the 45-cent cost *without* handing over extra coins that would simply be returned, the answer would include the 8 ways given in the key plus two more (2 quarters and 5 dimes), for a total of 10 ways. Jeff Marsh and Barbara Kane submitted similar appeals along these lines. The other acceptable answer, 1300, is the total number of ways that coins equaling or exceeding the 45-cent cost can be assembled from the given coins, regardless of whether some of the coins would merely be returned.

■ Problem 2-4: Question Withdrawn This question was undoubtedly the most controversial of the contest, and after a thorough review of all the comments and appeals submitted, we are withdrawing the question. All students will be given credit for 2-4. The combination of the phrase "at most" with the word "need" left many people unsure as to whether the question called for a minimum or a maximum number of cuts. Some questioned whether the tape being on a roll necessitated an additional cut (Andy Macpherson, Tom North, Karen Katz, Tim Corica, George Adams, and Mark Rapaport), while others brought up other issues (Pete Pederson, Christopher Ing) including questioning the definition of the word "cut" itself! For the record, the absolute minimum number of cuts required would be 2, assuming that the tape is accordion folded the appropriate number of times prior to each cut and that 251 pieces must be created before the final 2008. Thanks to Catharine Asaro for submitting that answer and to Bill Tabrisky for raising the possibility of folding. Stacking without folding would allow the job to be done with 11 cuts, as submitted by Jon Graetz.

■ Problem 2-5: Comment Tom Doherty said, "I love question number 5." Karen Katz said, "I did like question 5!" Susan Kantey said, "The fifth question was challenging — I liked it." Bob Lochel said, "I appreciated that questions 5 and 6 on contest #2 were challenging problems that were best approached by not relying on technology. Question 5, in particular, successfully challenges a student to recognize the meaning of a composite function."

■ Problem 2-6: Comment and Alternate Solutions Some advisors noted that there are other acceptable ways to express the correct answer. As always, any answer mathematically equal to the correct answer, or correct to 4 significant digits, is acceptable. Thus, as Jenny Simpson, Terry Young and Eileen Manzi asked, 1.618 is an acceptable answer in this case. In addition, Leanne Branham asked, "Would 'phi' or the symbol for it be an acceptable answer?" Yes, either of those would be acceptable as well. Jean Nightingale said, "I thought problem #6 on the 2nd contest was very difficult!" James Conlee suggested "using $a = 1$ for the shortest leg, then solving $x^2 - x - 1$ with the quadratic formula," and further said, "#6 is a beautiful problem with an even more sublime answer." Lucas Zavala used a graphing calculator to find the smallest positive angle A that satisfies $\tan A = \sin(\pi/2 - A)$. He then calculated $\csc A$, which is the desired ratio. Caleb Lareau took a similar approach using the sin and tan functions, but used the quadratic formula to solve for $\cos\theta$. Junyan Miao solved it by using the similar triangles created when an altitude is drawn to the hypotenuse of a right triangle. Labeling one leg of the right triangle b and the sections of the hypotenuse $c-b$ and b, he used the Pythagorean Theorem to get the quadratic equation $x^2 = b^2 - (c-b)^2$ and the ratio of the corresponding sides of the two smaller similar triangles to get $x^2 = (c-b)b$. Combining them, he could solve for c/b. Krista Bretz and Monica Lobser thought that the wording of the question could have been clearer. Greta Mills said, "This was a great problem! I knew as I was working through it that it would lead to phi, but how satisfying (especially for the students who got it) to arrive at the solution. Thanks for interesting and challenging problems!"

Statistics / Contest #2

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

2-1	90%	2-4	—%
2-2	88%	2-5	18%
2-3	75%	2-6	4%