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. You can see your results at *www.mathleague.com* before they arrive in the mail!

■ **Send Your Comments** to comments@mathleague.com

■ **Upcoming Contest Dates & Rescheduling Contests** Contest dates (and alternate dates), all Tuesdays, are February 24 (February 17) and March 24 (March 17). If **vacations, school closings, or special testing days** interfere, please reschedule the contest. Attach a brief explanation, or scores will be considered unofficial. We sponsor an *Algebra Course I Contest* and contests for grades 4, 5, 6, 7, and 8. Get information and sample contests at *www.mathleague.com.*

■ **2009-2010 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 Oct. 20(13), Nov. 17 (10), Dec. 15(8), Jan. 12(5), Feb. 23(16), and Mar. 23(16). If you have a testing or other conflict, right now is a good time to put an alternate date on your calendar!

■ **What Do We Publish?** Did we not mention your name? *We use everything we have when we write the newsletter.* But we write the newsletter early, so sometimes we're unable to include items not received early enough. We try to be efficient! Sorry to those whose solutions were too "late" to use.

■ **T-Shirts Anyone?** We're often asked, "are T-shirts available? The logo lets us recognize fellow competitors!" Good news — we have MATH T-shirts in a variety of sizes at a **very** low price. Use them as prizes for high or even perfect scores, or just to foster a sense of team spirit! The shirts are of grey material and feature a small, dark blue logo in the "alligator region." A photo of the shirt is available at our website. There's one low shipping charge per order, regardless of order size. To order, use our website, *www.mathleague.com.*

■ **Contest Books Make A Great Resource** Have you seen our contest books? Kids love to work on past contests. We've enclosed a flyer about ordering books from us.

■ **General Comments About Contest #4:** Keith Calkins said, "Nice mix of questions, but high of 4 rather disappointing. Hopefully better scores next time." Dr. Jesse W. Nash said, "I had many students who didn't score more than 3 on this contest — they seemed to think this was the most difficult thus far." Aurora Burdick wrote, "For some reason my students found this contest very challenging." Sean Murray said, "Overall I liked this test. It involved at lot of advanced algebra techniques which made it harder for some of my younger test takers, but the older students seemed to really like the questions ... Thanks again for the wonderful tests, we look forward to [Math League] every month!" Robert Morewood said, "Thanks for another great contest." Kelly Ogden said, "This one was really tough for the kids." Mark Luce said, "I thought this contest was a bit easier than most previous contests and yet, paradoxically, my students did not do as well on it. Some of my better students, having gone through a calculus sequence, seem to have forgotten how to solve simple exponential equations of the type seen in problems 3 and 4!" Catherine Broyles said, "Great job with all this. My kids are not usually the high scorers but those that participate really have an enriching experience. I believe that's important. Thanks again." Sara Glodoski said, "I thought this was a very difficult test." Susan Wong said, "A really challenging competition — the hardest this year so far!" Fred Harwood said, "Wow! This one really pushed me. My nineteen kids were spread from 1 to 6." Jayson Kiang said, "The kids said this was the hardest this year thus far!" Halyna Kopach said, "Students found this contest quite a bit more difficult than previous ones." Richard Serrao said, "Another excellent contest, always wanted to be a messenger boy..." And, finally, Kathy Erickson said, "My students wrote the following poem in response to Contest 4: 'On a scale from e to π, we give Contest 4 an i.'"

■ **Question 4-2: Comments and Appeal (Denied)** Several advisors commented on our use of the term "apocryphal" in this question. These advisors included Keith Calkins, Michael Sloan, Fred Harwood, and Robert Lochel, who said, "While I often appreciate the playfulness in the tone of contest questions, using the word 'apocryphal' in question 2 caused more confusion than anything else. Some students thought this word must represent a hint, or a math term they hadn't yet encountered." Point taken, but we believe that the use of such a word in a context not integral to solving the question creates a great opportunity for incidental learning. Karen Parker said, "The question is far too simple, which misled the students. All that is being asked is which of the four values is prime? I had a student notice that when each value of p is substituted in, the first results in a difference of cubes and the third and fourth result in a difference of squares, all of which can be factored and are therefore composite." Robert Morewood said, "I usually don't like multiple choice, but #4-2 made a neat story (similar to something I experienced with the 33rd Mersenne prime)." Sue Garcia asked whether she was correct in rejecting a student's answer of "Globe." Since the question specifically asked for the value of *p* and not for the name of the paper, Sue was indeed correct in not giving credit for that response.

■ **Question 4-3: Comments and Appeal (Denied)** Several advisors mentioned that the incorrect answer of $2^{1/5}$ was fairly popular. Tatiana Loudovina, Greta Mills, and Aurora Burdick brought it up. Sean Murray said, "Number 3 was a killer ... I lost track of how many students gave the fifth root of 2 as an answer (the value of n and not n^5)! It was a nice lesson in rereading the question to make sure that you are answering what it is asking!! ... I had about 5 kids put down $n^{10}/2$ for the answer ... algebraically it is correct, but we talked about the question asking for the VALUE of n^5 not an expression for n^5." Dan LaVallee said, "While I agree that it is important for students to read questions carefully, asking for n^5 rather than n in problem three may have been a little too much. Most of my best students had $2^{1/5}$ as their answer." For the record, part of our rationale for asking for n^5 rather than n was to make it a little easier for students to spot the potential approach of replacing n^5 with x and then solving for x.

■ **Question 4-4: Comment and Appeal (Denied)** Robert Mastorakis and Stephen Demos each noted that one or more students misread the question as involving the cube root of x and not $3\sqrt{x}$ as it actually did. Douglas O'Roark asked whether he was correct to reject answers of "1, 36" given that the question specifically asked for all values of x **greater than** 1. Yes, he was!

■ **Question 4-5: Comment and Alternate Solutions** Robert Morewood built a physical model of the situation for his students, complete with elastic "lines" and movable pegs to model variations on the theme. Using this model, he demonstrates that reflecting the segment from (4,0) in the segment from (0,2) to (2,0) creates an intersection of two straight lines with equal vertically opposite angles. At that point he sets the equations of the two resulting lines equal to get the correct answer. (Anyone interested in seeing Robert's model can see pictures at http://www.bodwell.edu/r_morewood/EqualAngle.jpg and http://www.bodwell.edu/r_morewood/StraightLine.jpg.) Talis Nguyen-Brics proposes another alternative involving similar right triangles created by drawing lines perpendicular to the x-axis and y-axis from the point (x,y).

■ **Question 4-6: Comment, Alternate Solution, and Appeal (Denied)** Greta Mills said, "Problem 6 was VERY difficult! A great challenge, even though none of my students got it." Jenny Shen proposes an alternate solution similar to our Method II, but she uses tables of time, rate and distance traveled for each messenger for each of the two legs of the trip (before the meeting and after) to clarify the situation and set up the equations. Aurora Burdick has a student who submitted an answer of 2 minutes, 24.5 seconds. Unfortunately, although that answer is very close, it is not correct to four significant digits and is therefore not acceptable.

Statistics / Contest #4

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

Prob	%	Prob	%
4-1	84%	4-4	48%
4-2	72%	4-5	18%
4-3	49%	4-6	11%