



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 enclosed form to register for contests or to **Order Books of Past Contests**. Also, keep an eye on our website, as we plan to roll out new products for next year, including new contest offerings!

■ **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). *Do you have a testing or other conflict?* If so, right now is a good time to put the alternate date on your calendar!

■ **End-of-Year Awards and Certificates** Symbols identify winners. We ship plaques to the advisors. Errors? Write to *Math Plaques, P.O. Box 17, Tenafly, NJ 07670-0017*. 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? If so, send a **self-addressed, stamped envelope large enough to hold certificates (you need to use *TRIPLE* postage)** to *Certificates, P.O. Box 17, Tenafly, NJ 07670-0017*. (Please allow one week.)

■ **General Comments About the Contest** James Conlee said, "Great questions this year! ... Looking forward to next year." Aurora Burdick said, "I thought this was a very nice and fun contest and a perfect one to end the year with. Unfortunately my students did not find it easy or fun. ... Personally, I really liked the March contest." Keith Calkins said, "Nice contest which required no calculator! Having identical answers to questions 3 and 4 certainly gave students pause enough to check their work (maybe)!" Linda Muratore said, "Thank you for providing another great year of math contests. ... Although we participate in other math contests, [yours] is the favorite of most students. We look forward to next year." Paul Westra said, "Thanks for another great year of contests. We achieved our highest cumulative score ever!" Dr. Jesse W. Nash said, "Great fun, great job." Kathy Erickson said, "We enjoyed our first year in the Math League. Thank you for spicing up our Tuesdays with explosively challenging math! We look forward to next year with calamitous enthusiasm as we begin our rigorous off-season training regimen, including: solving multivariable equations, factoring with synthetic division, identifying the many uses of the golden ratio, and weightlifting." John Saurine said, "Thanks for the great contests and all the support this year." Jon Graetz said, "This was a tricky set with easy errors to make, particularly on #1, where factoring 2009 into $7^2 \times 41$ made several of my good students ignore 1 as a factor of 2009, and #4, which had an off-by-one error that was too easy to make." Denes Jakob said, "Thanks for yet another great year of Math League contests. Many of the questions have generated some good math discussions among my enthusiastic 'Math League' students." Mark Luce said, "Thank you for another very nice contest, and for all of the contests this year. My students have learned a lot from them, and that is what I value the most. And another very lovely Golden Ratio problem!" Barbara Brown said, "Good questions this year. Keep up the good work." Richard Serrao said, "Thanks for a great year of contests!" Finally, we at Math League would like to thank YOU for all your wonderful comments and feedback over the course of the year. See you next year!!

■ **Question 6-2: Comment and Appeal (denied)** Keith Calkins said, "Many students assumed you could rearrange the numbers in 6-2 (or ignore order of operations!)." Richard Wright echoed that thought, saying, "Some of the students assumed that the calculations needed to be calculated from left to right, ignoring order of operations." Barb Dawson said, "I had two students wonder if you would accept either of the following for 6-2 on today's contest: ' $5 + 4 \times 6 - 3$ ' or '+, x, -'." Since neither of those answers is an answer to the specific question that was asked, neither can receive any credit.

■ **Question 6-3: Alternative Solution** Denes Jakob provides a great alternative solution on this one, writing, "An alternate solution to 6-3 is using equivalent fractions and getting common numerators: So $\frac{3}{65} < \frac{1}{n} < \frac{9}{100}$ becomes $\frac{9}{195} < \frac{9}{9n} < \frac{9}{100}$. With common numerators, the smaller the denominator, the greater is the fraction. So, $100 < 9n < 195$; dividing by 9 and for integer values of n , we have 10 values from $n = 12$ to $n = 21$."

■ **Question 6-4: Appeals (denied)** We received a lot of feedback about this question, with a few advisors arguing that an answer of 9 would have been more correct and should have been accepted. Bill Tabrisky, Diane Wilsdon, and James Williams were among those arguing that a "real-world" approach would lead to that answer. We went to Professor Brian Conrad, Mathematics Department, Stanford University, for an opinion; he said that the greatest integer function and the nearest integer function give different answers to this question. The answer 9 *would* have been correct if the question had asked, "At most how many full years of oil supply would we then have?" In the question posed on the contest, the answer 10 is correct, since the question specified rounding the actual (non-whole) number of years to the nearest integer. Joanne Gilette had yet another appeal, saying, "some students wanted to know if the year 2019 was an acceptable answer, since it is ten years from now." Since the question asked *how long* the oil would last, the answer of 2019 is incorrect.

■ **Question 6-5: Comment and Appeals (accepted and denied)** Benjamin Dillon said, "Mild criticism: Dashed lines in geometric diagrams are almost exclusively used to indicate that they are behind an obscuring plane. Thus, I believe some students may have been thrown off by the diagram. Using bold lines for the sides of the triangle would have been a better choice." Jeff Holland had a student "write out 'The Golden Ratio' as an answer ... rather than writing the actual mathematical expression." Since this is the accepted name of the number that is the answer to the question, the student can be given credit! On the other hand, Erik Berkowitz had a student who wrote 4.8989 as the answer to this question; unfortunately, that answer is *not* acceptable. It is the truncated form of the decimal answer, not a properly rounded response as our rules require (*four or more significant digits correctly rounded*). A student wanting to specify an answer to this question to the fourth digit to the right of the decimal would have had to give 4.8990 as the answer.

■ **Question 6-6: Comment and Alternate Solutions** Cyndee Hudson said, "I had just introduced the sum rules for sin/cos in trig, and they were so surprised to be able to follow the explanation of the solution. Great job!" Mike Ruggie suggested using LaGrange Multipliers to find the solution. Paul Arrigotti had another approach, saying, "The last problem could be done by writing the expression one is trying to maximize in terms of "x" or "y" by using the first relationship. Then one may use a graphing calculator to find a 4-digit approximation for the desired value."

Statistics / Contest #6

Prob #, % Correct (all reported scores)

6-1	58%	6-4	53%
6-2	83%	6-5	25%
6-3	70%	6-6	9%