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*!

■ Dates of Final HS Contest and Algebra Contest Our final contest of this school year is March 13 (with an alternate date of March 6). In addition, this year happens to be the 18th year of our annual April *Algebra Course I* contest. There's still time for your school to register! Go to **www.mathleague.com**.

■ 2012-2013 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 16 (Oct. 23), November 13 (Nov. 20), December 11 (Dec. 18), January 8 (Jan. 15), February 12 (Feb. 19), March 12 (Mar. 19). Please note that starting in October 2012, each alternate date will be on the Tuesday **following** the official date!! 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 prior to the regularly scheduled date, so the results can still be submitted on time. Report your scores by Friday of the official contest week. 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 24th. 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 Match 23rd.* 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: There certainly seemed to be a trend among the general comments this time around! Paulette Sirakos said, "Students found this contest particularly challenging." Dave Ollar said, "I've been giving these {contests} for 20 years & we've never had anywhere near scores this low. While I wish our kids had done better, I think this will discourage most of them from coming next month. It will be interesting to see how other schools do." Roger Finnell said, "Extremely difficult. Why not a broader range of difficulty of questions? Very discouraging to many." Rob Frenchik said, "This test was very difficult. Many students finished with 0 points. There needs to be a mix of questions so everyone can do something." Andrea Schaeffer said, "The contest was extremely difficult for the majority of our students." Donald Nitti said, "The scores on this test are by a great margin the lowest my students have ever gotten in many years. They found the wording quite confusing. ... This is my first time with a negative comment or challenge to the test. Thank you, we enjoy the challenge of the tests. This time maybe a little less than usual." David Holze said, "This particular contest was very quadratic equation heavy. Maybe in the future, these could have been spread out more between the six contests?" Fred Harwood said, "Well this one our younger students found very tough. ... I hope it hasn't scared the younger students away. Some of them have been outperforming their elders. Thank you for pushing our envelopes (but remember some younger grades try too.)" Albert Roos said, "Due to a conflict with science fair, we had a low number of participants. Next year I will plan to avoid such conflicts." Jon Creamer said, "Thanks for another interesting Contest." Lew Davison said, "Thanks for all you do with such great contests!" Mark Fowler said, "A very challenging contest as we would expect this late in the year. Thanks." Sean Murray said, "Even though my team didn't score very high on this one, personally I REALLY liked it. There were some great algebra questions on this one!" Robert Morewood said, "Thanks for another intriguing contest."

■ Question 5-1: Comment and Appeals (Accepted) Robert Morewood said, "It was scary how badly students did with the not-quite-standard equation solving in #1!" Jonathan Stevens appealed on behalf of a student whose answer was 3566.18. Since this answer has 6 significant digits correctly rounded, it is correct. Margaret Hoffert appealed for the answer $\sqrt{2012^2\pi}$. This answer is equivalent to the official answer and should also receive credit.

■ Question 5-2: Alternate Solution Lew Davidson submitted an alternative solution:
Set $x^2 + kx + 600$ equal to $(x + n)(x + n + 1)$ where $n > 0$.
From $x^2 + kx + 600 = x^2 + (2n + 1)x + n^2 + n$, one gets
$k = 2n + 1$ and $600 = n^2 + n$.
From the latter, the only positive solution for n is 24; from the former, $k = 2(24) + 1 = 49$.

■ Question 5-3: Appeals (Denied) John Bartlett and John Walter each wanted to confirm that a student response including 0 along with the otherwise correct answers should not be given credit. As they suspected, since the question specified non-zero numbers, any answer including zero is incorrect. As Chip Rollinson said, "Too bad there isn't partial credit! I had ... two students include 0 as a solution to question 5-3. ... Very frustrating. Oh well."

■ Question 5-4: Appeals (Accepted) Many, many advisors wrote in to appeal this question. We have to admit that the wording could have been clearer! Under the circumstances, answers of "40, 40" or "60, 60" to this question are acceptable, since the question did not specify that the two birds had to have different prices. Similarly, answers of "80, 120" or "100, 100" are acceptable, since the wording of the question allows for the interpretation that the answers would be the possible sums of the two prices. We will also allow credit to an answer of "80, 100, 120" from students who tried to cover all of the possibilities. Answers of a single number such as "40" or "60" are not acceptable.

■ Question 5-5: Comments and Appeal (Denied) Kathir Brabaharan said, "Students are not familiar with arctan notation anymore. It is a very nice question." Liuba Chulkova, Fred Harwood, and Robert Morewood echoed that sentiment. Robert said, "It is a real pity that many students are not equipped to understand #5 because it is a very nice question! On the other hand, many students did not read even what you did give. I saw answers of both 'yes' and 'no'!" Bill Daly said, "#5 was a great problem, however the answer was too easy to guess." Mark Fowler agreed, saying, "5-5 had an intriguing solution; unfortunately it was very easy to guess, which most of our students did instead of reasoning and using their trig knowledge." Kevin Morrisroe also pointed out the ease of a correct guess. David Hankin appealed on behalf of a student who answered "1, 2, 3" with no parentheses. Credit cannot be given for that answer, since the question specified that the answer be an ordered triple.

■ Question 5-6: Appeals (Accepted and Denied) and Alternate Solutions Lenny Clark and Rachel Levin each appealed on behalf of a student who answered "$\sqrt[3]{4}/2$," the equivalent of the correct answer with a rational denominator. Credit can be given for this answer. David Hankin appealed for an answer of "$\sqrt[3]{2^2}/2$," which is similarly correct. Rebekah Moe appealed on behalf of students who set $a = 0$ and answered "-1." If a is 0, then the given equation has three distinct roots — the three roots of -1 (two of which are complex but not real). Hence, -1 is not a correct answer to this question. John Walter submitted that several students solved by synthetic division. Robert Morewood had a student solve using calculus, reasoning that, "a double root is also a root of the derivative: $3x^2 + a = 0$ or $a = -3x^2$. Substituting in the original gives $-2x^3 + 1 = 0$ so x is the cube root of $1/2$."

Statistics / Contest #5

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

5-1	67%	5-4	38%
5-2	55%	5-5	36%
5-3	29%	5-6	6%