Math League News

■ New Calculator Rule Our contests say that neither a TI89 nor a TI92 is permitted. That rule has changed. Since Contest 2, we have allowed any calculator without a QWERTY keyboard.

■ Use the Internet to View Scores or Send Comments Just go to http://www.mathleague.com and look around!

■ Future Contest Dates and our Algebra Contest Our final contest is Mar. 20. This is year 8 of April's *Algebra Course I Contest*. To participate, write for information.

■ Rescheduling A Contest & Mailing Results Numerous advisors wrote to complain that contest #5 was scheduled for the same day as the AMC-10 & AMC-12 contests. To avoid this problem, we'll return to a schedule that ends in early April. If there's a schedule difficulty, note that, when "school closings **or testing days**" so require, our rules allow you to use an alternate contest date. We prefer that you use the **previous week**, so we get the results on time. Mail scores by Friday of the official contest week. If scores are late for due cause, attach a brief explanation. Late scores unaccompanied by such an explanation are not normally accepted.

■ Next Year's Contest Dates fall on the following Tuesdays: Oct. 30, Dec. 4, Jan. 8, Feb. 5, Mar. 5, and Apr. 9. We also sponsor contests for grades 4, 5, 6, 7, 8 and *Algebra Course I*. Use the enclosed form for any contest or for **books of past contests**.

■ End-of-Year Awards Engraving of awards begins Apr. 6. We give awards to the 2 schools and 2 students with the highest totals in the entire League and to the school with the highest score in each region. *Winning schools must postmark their results by Mar. 23*. Results postmarked later *cannot* be used to determine winners. Completion of the cumulative column is optional, but student awards are based only on scores *regularly* listed in that column. (Student certificates of merit were enclosed with Contest 5.)

■ General Comments About Contest 5 Dave Farber "thought this was a reasonable contest" but seems to have been a minority. Brian Barnes thought it was the "most difficult contest in quite some time. Frustration set in this time." M. Buonviri said "For some reason this one was tough for my kids. I can't believe so many missed #2 and #3." Susan Cunningham thought "the 5th contest was one of the hardest yet." Tim Timson said "It continues to be a pleasure and a rewarding experience to challenge our students with the six contests each year. The questions are well-designed, creative, and appropriate." Linda Muratore said "This is my first year doing Math League. This has been such a positive experience for me and for many of the students and other math teachers."

■ Question About Appeals Procedure Linda Muratore noticed that we granted an appeal for the answer "2001" for question 3-4, and she asked if the score of a student of hers who gave the answer "2001" should be adjusted. If a score adjustment is requested, it must be granted. It isn't your responsibility to change scores if no such request has been made, though you may if you wish to and if you know which scores to change.

■ Problem 5-3: Appeal (Denied) One student sought credit for the value of x that made the area of the shaded region 40% of that of the *entire* region. The denial was automatic. The question asked for the value of x that would make the shaded region have 40% of the area of the *unshaded* region.

■ Problem 5-4: Alternate Solution Dave Farber combined fractions on the left side of each equation, then divided and simplified to get $y = 3x$. Substitute back into the original equations to get $x^2-3x+2 = (x-1)(x-2) = 0$.

■ Problem 5-5: Appeal (Denied) & Comments An appeal to think of "number" as meaning "natural number" (for this question) was denied. Unless specifically otherwise stated, a "number" is presumed to be a real number. One advisor who acknowledged that we had requested the *smallest* number greater than 1 which had a specific property asked "would you consider 10 to be correct if the word smallest were not used?" There are infinitely many numbers that would then be correct. For example, any power of 10 would qualify. Susan Cunningham said "Many students answered 10 instead of $\sqrt{10}$." One advisor did not like the question because we "asked for a decimal representation of an irrational number." Actually, although we never asked for a decimal representation of an irrational number, we see nothing wrong with such a representation. In fact, the easiest definition of an irrational number, from the point of view of students, is that an irrational number is a non-repeating, non-terminating decimal. The "decimal" part makes it real, and the non-repeating, non-terminating part makes it not rational. Any real number that is not rational is irrational. Decimal approximations of irrational numbers are commonly used in engineering, science, and applied mathematics.

■ Problem 5-6: Comments, Accepted Appeal, Alt. Sol. Jeffrey Zhang got credit for writing answers in ordered pair form. In higher math courses, complex numbers are often defined as ordered pairs of reals. One advisor wrote that "students were confused by the words 'same positive integer' when the solution showed that n is a multiple of 6." Knowing that some (unknown) value of n makes the equation true is adequate information. If we gave that value, 5-6 would be easy to solve on some calculators, but not others. Susan Cunningham said her students had not yet learned DeMoivre's Thm. Dave Farber used the fact that the distance from z to $z+1$ is 1, the same as the radius of the unit circle. Then he used unit circle values to get the coordinates. Joe Brosseau said 5-6 was "just plain too hard for a high school contest." Student Steven Yates cleverly realized that the power of the real part stayed the same when 1 was added before the exponent was applied, the real part must have gone from −0.5 to 0.5. Finding the imaginary part was then easy.

Statistics / Contest #5

Prob #, % Correct (top 5 each school)

5–1	94%	5–4	81%
5–2	77%	5–5	23%
5–3	70%	5–6	4%