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.

■ Send Your Comments to comments@mathleague.com. View results at www.themathleague.com before they arrive in the mail.

■ Upcoming Contest Dates & Rescheduling Contests Future HS contest dates (and alternate dates), all Tuesdays, are Jan 10 (17), Feb 7 (14), & Mar 14 (21). (Each alternate date is the following Tuesday.) If vacations, school closings, or special testing days interfere, please reschedule the contest. Attach a brief explanation, or scores may be considered unofficial. We sponsor an *Algebra Course I Contest* in April, and contests for grades 4, 5, 6, 7, and 8. Get information and sample contests at *www.themathleague.com.*

■ Contest Dates for 2017-2018 and Alternate Dates: HS contest dates for the next school year (and alternate dates), all Tuesdays, are October 17, 2017 (October 24), November 14, 2017 (November 21), December 12, 2017 (December 19), January 9, 2018 (January 16), February 13, 2018 (February 20), and March 20, 2018 (March 27). Please note that each alternate date is the Tuesday **following** the official date!

■ 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.themathleague.com.

■ Contests for iPads and iPhones We have iPad/iPhone versions of ALL of our prior contests for grades 4, 5, 6, 7, and 8 and the Algebra contests available now, including last year's contests. We are not sure when high school contests will be available, but we are working on it! The link to these iPad/iPhone applications is on the home page of our website, www.mathleague.com. Take note of our current special offer: access to **all** past contests at any selected grade level for **all** students at a given school for the low, low price of only $9.95 for the year!

■ Administer This Year's Contests Online Any school that is registered for any of our contests for the 2016-2017 school year may now register at www.online.mathleague.com for the 2016-2017 Online Contests at no cost. The advantages of administering the online versions of our contests rather than the paper and pencil ones are that you do not have to grade your students' papers and that you do not have to submit any scores at our Score Report Center ~ these tasks are done automatically for you when your students take our contests online. If you decide to use this free service, you must set up your account and set the day you are going to administer each contest at least one day in advance of the actual contest date.

■ Students Hungry for More? Don't forget, we do offer the *Algebra Course 1 Contest* in April!

■ General Comments About Contest #3: Andreas Evriviades said, "So much fun, thanks."

■ Question 3-6: Comments and Alternate Solution Joel Patterson said, "Bravo! A great problem in logic, connecting symmetry, perpendicular bisectors, and number theory!" John Kaminsky said, "While an interesting question, I thought #6 was too easy of a question to make a guess about the correct solution. We had probably ten of our students get it correct but most showed no work for it." Peter Knapp suggested an alternate solution, saying, "I approached this somewhat differently from your solution. I supposed that (x,y) and (a,b) were two different points with integer coordinates on the circle and tried to find a relationship between them. Finding the distance from each point to the center and setting these distances equal yields

$$x^2+y^2+4-2\sqrt{2}x-2\sqrt{2}y=a^2+b^2+4-2\sqrt{2}a-2\sqrt{2}b.$$

Since x, y, a, and b are all integral, the irrational parts of this must be the same: thus,

$$-2\sqrt{2}x-2\sqrt{2}y=-2\sqrt{2}a-2\sqrt{2}b,$$

which reduces to $x + y = a + b$. Thus, all integer coordinate points on the circle have the same coordinate sum. So, if there is one point on the circle with integer coordinates, ALL such points will satisfy $x + y = k$, for some k. So, all such points will be collinear. Since a circle and a line can intersect in at most 2 places, the answer is 2."

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Statistics / Contest #3

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

3-1	94%	3-4	59%
3-2	77%	3-5	28%
3-3	67%	3-6	25%