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 7 (14), Feb 11 (18), & Mar 17 (24). (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*.

■ **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 all grades available now, including last year's contests. 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 2019-2020 school year may now register at www.online.mathleague.com for the 2019-2020 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.

■ **Contest Dates for 2020-2021 and Alternate Dates:** HS contest dates for the next school year (and alternate dates), all Tuesdays, are October 13, 2020 (October 20), November 10, 2020 (November 17), December 8, 2020 (December 15), January 5, 2021 (January 12), February 9, 2021 (February 16), and March 16, 2021 (March 23). Please note that each alternate date is the Tuesday **following** the official date!

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

■ **General Comments About Contest #3:** Robert Morewood said, "Wonderful questions! Every one of them is providing investigations for the junior students." Chip Rollinson said, "Another solid group of questions."

■ **Question 3-4: Comment** Chip Rollinson said, "For #4, I had quite a few students give values of t rather than x."

■ **Question 3-6: Alternative Solutions** Chip Rollinson said, "For #6, an alternative solution is to use 'balls and urns' (aka the less PC 'stars and bars') method. Give each grandchild $10 first. For the remaining $50, it is divided 5 ways so you need 4 dividers. You can then think about the ways to rearrange the 50 dollar bills and 4 dividers which is 54!/(50!*4!) or C(54,4)." James Goodman proposes an alternate solution inspired by the official solution to Question 2-3 from the last contest. He said, "The published Math League solution to this is elegant - both simple and clear. But I noticed a parallel between this question and one from the previous month's problem set, and I thought it would be fun to explore a different, albeit more complex solution." James started by imagining that there were only 2 grandchildren to divide the discretionary $50, and assigned each child an axis and plotting only points in the first quadrant with a "separation" of 50 from the origin. There are 51 such points (0,50), (1,49), ... (50,0). Extrapolating to three dimensions, all the same points would work with a z-coordinate of 0. A z-coordinate of 1 would work with (x,y) coordinates (0,49)...(49,0), and each higher z-coordinate would be associated with one fewer (x,y) combinations so that the total number of acceptable points in three dimensions would be 51+50+49+...+1=1326. Further extrapolating to 4- and 5-dimensional spaces will lead to the correct answer to the question, though the visualization on coordinate axes becomes exceedingly difficult.

Statistics / Contest #3

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

3-1	77%	3-4	32%
3-2	49%	3-5	20%
3-3	59%	3-6	8%