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.

■ **Adjusted Rules for 2020-2021 and Our Internet Score Center** For this school year, we have loosened our rules regarding testing. We will allow the contests to be given either at home or at school, and on multiple testing days. Please administer the contests on any day or days during the week of the official test date or the alternate test date. We will be emailing password-protected pdf copies of each contest rather than mailing paper copies to the schools. You may either use these pdfs or our online testing site. This temporary policy is a work in progress, so we may revise our procedures based on feedback from the participating schools. Instructions for submitting scores will be in the emails we will be sending approximately ten days prior to each contest. Scores you enter may be reviewed at any time by returning to the Internet Score Center. About 3 weeks after a contest, scores appear on our Web site, *www.mathleague.com.* Late scores must be accompanied by a brief explanation of the reason for lateness.

■ **Contest Dates** Future HS contest dates (and alternates), all Tuesdays, are November 10 (Nov. 17), December 8 (Dec. 15), January 5 (Jan. 12), February 9 (Feb. 16), and March 16 (Mar. 23). Please note that each alternate date is on the Tuesday following the official date. As noted earlier in this newsletter, **while these dates are the official contest dates, under the unusual circumstances this year presents contests may be administered on any one *or more* days during the weeks of the official and alternate dates**. If your scores are late, meaning beyond the week of an alternate date listed above, please submit a brief explanation. We reserve the right to refuse late scores lacking an explanation. We sponsor an *Algebra Course I Contest* in April, as well as contests for grades 4, 5, 6, 7, & 8. See *www.mathleague.com* for information.

■ **Administer This Year's Contests Online** Any school that is registered for any of our contests for the 2020-2021 school year may register at http://online.mathleague.com for the 2020-2021 Online Contests at no cost. In addition to possible facilitation of social distancing during the Covid-19 pandemic, 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.

■ **Eligibility Rules** Only students officially registered as students at your school may participate. That's our rule.

■ **Authentication of Scores** To give credibility to our results, we authenticate scores high enough to win recognition. Awards indicate compliance with our rules. Please print the Selected Math League Rules (posted on the same page as this Newsletter) and have students read them and then sign them to confirm knowledge of the rules. *Keep* the signed sheets. Do *not* send them to us unless we request authentication from you.

■ **A Word About Awards** Our primary purpose in sponsoring these contests has always been to foster the interest in and enjoyment of mathematics, as well as to give students the opportunity to see challenging questions that they might not see in their regular classroom studies. To those ends, we suggest that you share our contests with all the math students in your school. Unfortunately, due to the loosening of contest rules necessary to address the realities of Covid-19 (allowing our contests to be given on multiple days, at school or at home, with or without teacher supervision), we will not be awarding plaques to high-scoring schools or students during the 2020-21 school year.

■ **Past Contests Online** Teachers of any school registered for any of our 2020-2021 contests can now purchase online versions of the past contests for any selected grade (4th Grade through High School) for $9.95 per grade level for use throughout this school year at http://online.mathleague.com . For this fee, all students in your school can take all the past contests for a specific grade online. We grade each contest for you, provide you with answers and solutions, and keep statistics on each student's performance.

■ **Another New Look!** Math League has been proud to feature the cartoons of very gifted cartoonists on our contests in the past, including those of Phil Frank and Marty Riskin. Those cartoons were instrumental in giving our contests that signature Math League look that we've all come to know and love. Luckily for all of us, lightning has struck a third time! Math League is thrilled to announce that in future school years new cartoons will be drawn by the very talented artist Ryan Pagelow, who some of you may know from his fantastic series of "Buni" comics. We are confident that the Math League community will love the playful humor that Ryan brings to his work. Welcome aboard, Ryan!

■ **We Are on Facebook!** Like us at https://www.facebook.com/TheMathLeagueInc

■ **Send Your Comments** to comments@mathleague.com.

■ **General Comments About the Contest** Ben Frisch said, "[Question 1-]4 gave the team some trouble as did [Question 1-]6."

■ **Question 1-1: Appeal (Accepted)** Todd Rosio and Jon Graetz each appealed Question 1-1 for similar reasons. As Jon Graetz said, "#1 was extremely confusing, since 'itself' should refer to the most recent object in the sentence (meaning 2020 times 2020). This would yield no solution, of course, but it gave no end of head-scratching. Shouldn't it have said, 'times the number' (or something similar)?" On one hand, we believe the language of the Question 1-1 is fairly clear, with "itself" referring to the same number each time the word is used; in addition, there is a contest rule that when a question might be interpreted in more than one way, an interpretation that trivializes the question should not be credited. On the other hand, we understand that a student who initially interpreted the question as Todd or Jon is suggesting might be subsequently unable to parse the non-trivial meaning of the question. Thus, credit for this question should be given to students who wrote "impossible" or words to that effect (in addition to those students who answered "1/2020").

■ **Question 1-3: Appeal (Accepted)** Jon Graetz appealed on behalf of a student who answered this question with sqrt(289). Since this is mathematically equivalent to the correct answer, it is acceptable and should be given credit.

■ **Question 1-4: Appeal (Accepted)** Christine Lowe, Olga Johnson, and Jamille Hernandez each appealed on behalf of students who answered this question with "100%." Since this is mathematically equivalent to the correct answer, 1, it is acceptable and should be given credit.

■ **Question 1-6: Alternative Explanation** More than one adviser asked whether there was another way to explain the solution to Question 1-6. Begin by noting that there are only 10 different prime numbers which are factors of 30!. Hence, there are only 10 prime numbers which are factors of a and b. Since none of these primes can be factors of both a and b, there are two possibilities for each of these ten primes: each prime is either a factor of a OR a factor of b, but NOT a factor of both a and b since their greatest common factor is 1. So there are two ways of placing each of these ten prime factors or 2^{10} ways of placing all 10 of them. Since $a > b$, we divide by 2 since half of the time $a < b$. It may help you if you think of a and b as jars in which 10 different items are going to be placed in one or the other of these two jars and then ask yourself, "In how many different ways can I place these ten items in two jars?"

Statistics / Contest #1

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

Prob #	%	Prob #	%
1-1	61%	1-4	17%
1-2	44%	1-5	34%
1-3	56%	1-6	6%