

# 2016 Math League International Tournament

Math League Press, P.O. Box 17, Tenafly, New Jersey 07670-0017

## July, 2016 – Grades 3 & 4

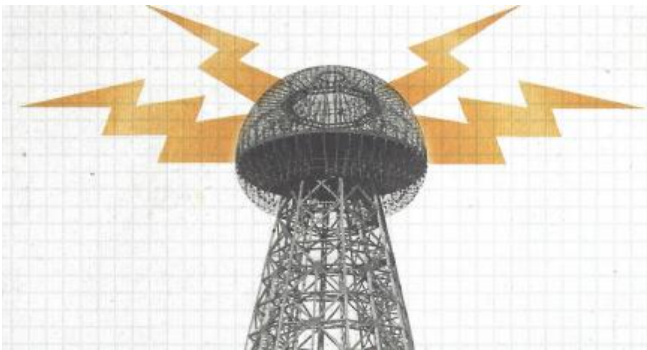
### Team Questions

Total points: 165 (Each Question is worth 15 points.)

Total pages: 3, Time limit: 90 minutes

Team: \_\_\_\_\_

1. In a sequence of 10 numbers, the average of the 10 terms is 13. If the average of the first three terms is 7 and the average of the next four terms is 10, what is the average of the last three terms?
2. If we juxtapose three congruent squares, we get a rectangle with perimeter 64. What is the area of one of the squares?
3. What is the tens digit of the sum  $9 + 99 + 999 + 9999 + \dots + 9999999999$ ? (The last term has 10 digits.)
4. In this problem, the word “kid” represents a person whose age is from 5 to 12, inclusive. Some kids go to a movie. The product of ages of these kids is 3080. What is the sum of the ages of these kids?
5. In a four-digit perfect square, the digits in the hundreds and thousands places are equal, and the digits in the tens and ones places are equal. What is this number?
6. Tom has constructed two prototypes for his “Death Ray” tower. Tower A can fire a beam of energy five times in five seconds. Tower B can fire ten times in ten seconds. Beams are fired one at a time, and the intervals between any two consecutive beams are constant. Assuming that he starts his watch when the first shot is fired, which tower can fire 12 beams in the shorter time? And how long does it (the quicker tower) take to fire 12 beams?



7. Tom's new tower was completed. The total value of the project was one million dollars. The cost of the construction was \$900,000 more than the cost of the land. So what did Tom pay for the land?



8. You are a prisoner in a strange land. You have been sentenced to death but are given one chance to live. The king of the land has decided to let you play a simple game to determine your fate:

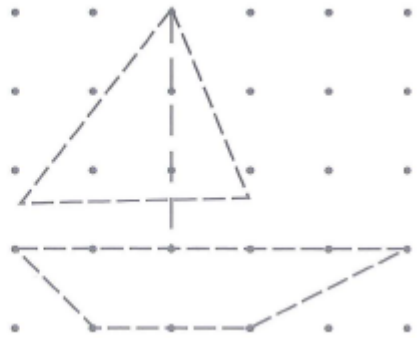
You are presented with two clay jars, one containing 100 white stones, and one containing 100 black stones. You are allowed to redistribute these stones any way that you like, but when you are finished all stones must be in the jars. After you have finished, both jars will be shaken up, you will be blindfolded, and you will be presented one of the two jars at random. You will pick one stone out the jar given to you. If the stone is white, your life will be spared. If the stone is black, you will be executed immediately.

How should you redistribute the stones to give yourself the best chance of survival?

9. You have a dozen identical-looking balls and a balance scale. One of these balls has a slightly different weight from all of the others. What is the minimum amount of times you need to use the balance scale to determine which ball has the unique weight and whether it is heavier or lighter than the others?

10. Enlarge the figure below by matching points on the small grid with points on the large grid.

**EXAMPLE:**





11. Reduce the figure by matching points on the large grid with points on the small grid.

**EXAMPLE:**

