2019 INTERNATIONAL MATH CONTEST

ID _____

Name _____

Grade _____

RSM Affiliation _____

Test Location _____

1

If $20 + XY + 19 = 100$, compute $20 + YX - 19$.

(*X* and *Y* represent the digits of the 2-digit numbers *XY* and *YX*.)

2

A car moved 1 second at a constant rate of 2 m/sec, then 1 second at a constant rate of 4 m/sec, then 1 second at a constant rate of 6 m/sec, and so on. All movements were in the same direction. In how many seconds would the total distance covered by the car be 110 meters?

3

Gary and Mary have the same number of candies. If Gary gives Mary half of all his candies, and then Mary gives Gary half of all the candies she has at the moment, Gary would have 12 more candies than Mary. How many candies do Gary and Mary have altogether?
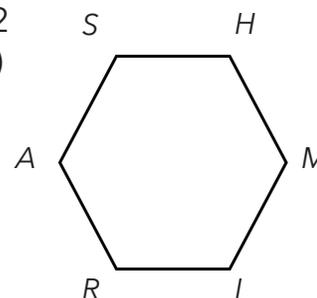
4

Numbers were written in 1000 boxes in a row, one number per box (only the first ten and the last five boxes are shown). For every four boxes in a row, the sum of their numbers was 12. Most of the numbers got erased over time, but three of them remain. What number was written in the last box on the right?

	0					1		2		...					
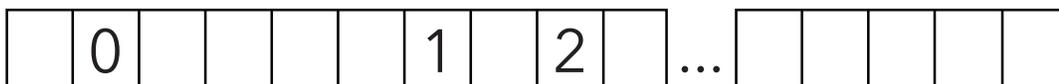
5

Four cats – Astro, Buttons, Calico, and Duchess – bought 30 mice altogether. Each of the four cats bought an odd number of mice. Buttons bought more mice than Astro, and Calico bought fewer mice than Duchess. What is the greatest number of mice that could have been bought by Astro and Calico altogether?
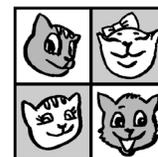
6

The area of a regular hexagon *RASHMI* is 9102 square feet. Compute the area (in square feet) of the triangle *RSM*.

Please fold over on line. Write answers on back.

FINAL ROUND

Grades 5-6

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7

Fatima drew a rectangle with side lengths that were whole numbers. The perimeter of the rectangle was a multiple of 7 and the area was a multiple of 9. Compute the least possible perimeter of Fatima's rectangle.

8

How many quadrilaterals of all sizes and positions are there in the diagram, including quadrilaterals that are made up of more than one shape?
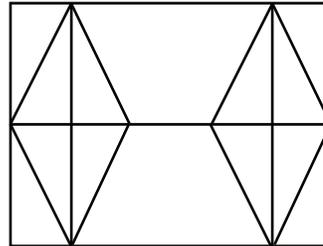
9

Stretch and Shorty are friends. Every January 1st they get measured and they write down the date, Stretch's height, Shorty's height, their total height, and their height difference (the amount by which Stretch is taller than Shorty). From January 1st, 2018, to January 1st, 2019, Stretch grew 5%, Shorty grew 2%, their total height increased by 4%, and their height difference increased by X%. Compute the value of X.

10

How many different whole numbers are there containing only the digits 1 and/or 2 (each of these digits can be used one or more times or not at all) such that for each of these numbers, the sum of all of its digits equals seven?

11

A teacher gave her students a paper square. The first student cut this square into two shapes, using one straight cut not through any of the paper's corners. The second student cut one of the resulting shapes, using one straight cut not through any of that shape's corners, and so on. After ten students had made their cuts, there were eleven shapes, including seven triangles, two quadrilaterals, and a pentagon. How many sides were in the remaining shape?

12

Say that a whole number is "five-important" if it is a multiple of 5 and/or contains the digit 5. For instance, the numbers 55, 120, and 456 are five-important, but the number 2019 is not. How many different five-important numbers are there between 1 and 2019?