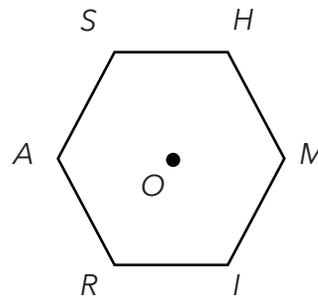


1 Given a 2019-sided red regular polygonal shape with side length 1, if each side also forms the side of a blue square shape located outside the red shape, what is the perimeter of the resulting red-and-blue shape?

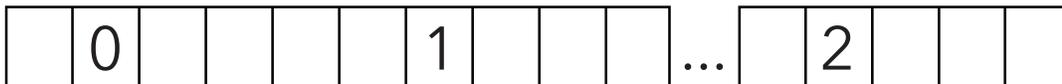
2 Gary, Mary, and Rory have the same number of candies. If Gary gives Mary half of all his candies, then Mary gives Rory half of all the candies she has at the moment, and then Rory gives Gary half of all the candies he (Rory) has at the moment, Gary would have 12 more candies than he had originally. How many candies do Gary, Mary, and Rory have altogether?



3 The area of a regular hexagon $RASHMI$ is 2019 square feet. Compute the area (in square feet) of the quadrilateral $RSMO$ where O is the center of the hexagon.



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?



5 If $\overline{RS} + \overline{SM} + \overline{MR} + X = 201$, compute $\overline{SR} + \overline{MS} + \overline{RM} + 7 \cdot X$. (R, S , and M represent the digits of the 2-digit numbers \overline{RS} , \overline{SM} , \overline{MR} , \overline{SR} , \overline{MS} , and \overline{RM} ; X also represents a digit.)

6 A race car moved 1 second at a constant rate of 68 m/sec, then 1 second at a constant rate of 69 m/sec, then 1 second at a constant rate of 70 m/sec, and so on. All movements were in the same direction. In how many seconds would the total distance covered by the race car be 2 kilometers?

Please fold over on line. Write answers on back.



7 How many different positive integers are there containing only the digits 1, 2, and/or 3 (each of these digits can be used one or more times or not at all) such that for each of these integers, the sum of all of its digits equals seven?

8 Five friends are all of different heights. The average height of the three tallest friends is exactly the height of one of them. The average height of the four tallest friends is exactly the height of one of them. The average height of all five friends is exactly the height of one of them. The second-tallest friend is 16 cm taller than the second-shortest one. The tallest friend is taller than the shortest one by how many centimeters?

9 Find the positive integer value of x if $\frac{1}{a + \frac{1}{a + \frac{1}{x}}} = \frac{19}{63}$ where a is a positive integer.

10 In a triangle RSM , the measure of angle SRM is twice the measure of angle RSM . A point O is selected on side \overline{RS} such that $SO = SM$. The length of the angle bisector of angle RMS equals RO . What is the degree measure of angle RSM ?

11 The number R has exactly 7 different positive integer factors, the number S has exactly 8 different positive integer factors, and their product $R \cdot S$ has exactly M different positive integer factors. Compute the sum of all different possible values of M .

12 Say that a positive integer 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. Say that a number is "super-five-important" if it is five-important and remains five-important after erasing any one of its digits. For instance, the numbers 5070, 5005, and 5577 are super-five-important, but the numbers 5, 100, 2019, and 2015 are not. How many different super-five-important numbers are there between 1 and 2019?

Please fold over on line. Write answers on back.