First Name _____

Last Name _____

Grade _____

School _____

City _____

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Please fold over on line. Write answers on back.

1 Find the second-smallest seven-digit multiple of 11.

2 A bag contains 18 small red, 19 small black, 13 large black, and 15 large red T-shirts, and nothing else. What is the least number of T-shirts Alpa must take out of the bag (without looking at them) to be absolutely sure of having at least two T-shirts among them that differ by both size and color?

3 From a piece of paper Felix cut out some heptagons and octagons with 2018 sides altogether. What is the greatest possible number of octagons among these shapes? (A heptagon is a shape with seven sides.)

4 A fruit drink is made from 25% pure fruit juice and the rest water. A barrel contained some amount of this fruit drink, but then by mistake, 60 liters of water was added to the barrel. How many liters of pure fruit juice must be added to the barrel to correct the mistake, so the barrel would again contain fruit drink with 25% pure fruit juice?

5 Three apples weigh as much as five kiwis. What is the least possible number of apples that weigh more than thirteen kiwis? Assume that all apples weigh the same, and all kiwis weigh the same.

6 Venus took 30 mixed numbers (none of them were whole numbers) and colored each of them either red or blue. On Monday she rounded each red number up and each blue number down to the nearest whole number, added the results, and got 2018. On Tuesday Venus took the same 30 red and blue original numbers, rounded each red number down and each blue number up to the nearest whole number, added the results, and got 2014. On Wednesday she took the same 30 original numbers, rounded each of them down to the nearest whole number, and added the results. How much did she get?

7 How many different positive whole numbers less than 2018 contain only even digits?

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2018 INTERNATIONAL MATH CONTEST

FINAL ROUND
Grades
5-6
RSM FOUNDATION

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8 A rectangular shape is divided into four non-overlapping rectangular shapes as shown in the diagram. The areas of these four regions (in some order) are 27 square feet, 20 square feet, 18 square feet, and N square feet, where N is a whole number. Compute the value of N.
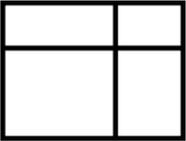
9 Leo and Theo each had several $20 and $50 bills. Leo gave Theo several of his $20 bills and got from him the same number of $50 bills, and after this exchange the money was divided equally between the boys. If after that Theo gives Leo all six remaining $50 bills, each of the boys would have as much money as other one had originally. How many $20 bills did Leo give Theo?

10 Say that a number is "striped" if all its digits are different, in every even position there is an even digit, and in every odd position there is an odd digit. Assume that the positions are numbered from left to right, starting at 1. For example, the numbers 1 and 1254 are striped, but the numbers 121 and 2018 are not. How many different striped ten-digit numbers are there?

11 Peter was standing in a line of RSM students. There were three times as many students in front of him as behind him. X students (more than 0 but fewer than 30) left the line but Peter and his friend did not. Then three times as many students were behind Peter as in front of him. Compute the sum of all possible different values of X.

12 A factorial number is the product of all whole numbers from one through some whole number. For example, 720 is a factorial number because $720 = 1 \times 2 \times 3 \times 4 \times 5 \times 6$. Now let's say that a positive whole number K is "interesting" if some factorial number ends in exactly K zeroes, and "boring" if no such factorial number exists. So the number 1 is interesting since the factorial number 720 ends in exactly one zero. Find the sum of the six smallest boring numbers.