MATHEMATICS WITHOUT BORDERS

WINTER 2019

AGE GROUP 2

INSTRUCTIONS

1. Please **DO NOT OPEN** the contest papers until the Exams Officer has given permission.

2. There are 20 questions with an open answer in the test.

3. Please write your answers in the ANSWER SHEET.

4. Each correctly solved problem earns 2 points, a partial solution earns 1 point, and unanswered or wrong answer gets 0 points.

5. The use of calculators or other electronic devices, as well as books containing formulae is NOT allowed during the course of the contest.

6. Working time: not more than 60 minutes. In the case of an equal number of solved problems, the higher ranked participant will be the one who has spent less time solving the problems.

7. No contest papers and draft notes can be taken out by any contestant.

8. Students are NOT allowed to receive help by the Exams Officer or by anyone else during the contest.

WE WISH YOU ALL SUCCESS!

Problem 1. Evaluate $2 + 3 + 9 + 21 + 27 + 38$. How many tens are there in the sum?

Problem 2. Serena added the numbers 21, 23, 26 and 29 correctly. Her sister Venus added the numbers 22, 24, 27 and 30 correctly. By how much is the sum that Serena got smaller than the sum Venus got?

Problem 3. Anya added 1 two-digit number and 1 one-digit number and got 27 as a result. After that she erased one of the digits in the expression and got $9 + 1 = 27$. Which digit did Anya erase?

Problem 4. How many of the numbers 4, 5, 6 and 7 can be written in the square $\square$ in such a way that $\square + 15 > 20$ would be correct?

Problem 5. Some boys and girls are playing in a playground. There are 18 girls and 4 more boys than girls. How many children are playing in total?

Problem 6. There are some apples and bananas in a fruit bowl. There are 7 apples, 4 of which are yellow. The total number of yellow pieces of fruit is 6. How many apples and bananas are there in total?

Problem 7. I wrote down 15 numbers. I erased a few of them and wrote down their sum. The numbers are now 9. How many numbers have been erased?

Problem 8. I wrote down 15 numbers. I erased a few of them and wrote down their sum next to the numbers. There are now 9 numbers written down. How many numbers have been erased?

Problem 9. How can I get the number 18 by using four digits 2 and some of the arithmetic symbols? Write down your answer in the answer sheet.

Problem 10. Alec, Boris and Catherine have 3 balloons in total. Each of them has a balloon in one of the following three colours: blue, green and yellow. Alec's balloon is neither yellow, nor blue. Boris's balloon is not yellow. What colour is Boris' balloon?

Problem 11. Two sides of a triangle are of equal length. Each of them is 1 cm longer than the third side. The third side is 1 decimetre. Find the perimeter of the triangle in centimetres?

Problem 12. Four different points: A, B, C and D, are placed along a straight line and are such that $AB = 7$ *cm*, $AD = 4$ *cm*, $AC = 4$ *cm*. Find the distance between the points B and D in cm.

Problem 13. A ribbon has a length of 36 centimetres. Iva cut out the ribbon into a few parts with different lengths in centimetres. What is the greatest possible number of parts that she could have got?

Problem 14. A swimming pool has a length of 50 m. Apart from the beginning and the end, there is a sign placed at each meter that shows the distance from the beginning of the pool. How many of the signs contain two-digit numbers?

Problem 15. How many rectangles are there?
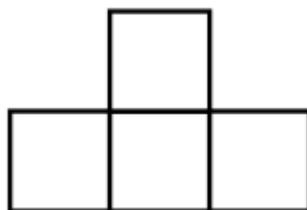
Problem 16. For how many two-digit numbers is the following information correct: "After erasing the tens digit, we get a number smaller than 2."?

Problem 17. Take a look at the following two different dice. After the dice were thrown, one of them fell with the number 4 on top (four points), and the other fell with the number 2 on top (two points). The total sum of the points is 6.

In how many ways can we get a sum greater than 9?

Problem 18. In how many ways can Alex, Boris, Catherine and Maria stand in a queue, if Maria has to stand right behind Boris?

Problem 19. Find values for A and B to make the following statement true

$$A + A + A = B.$$

Each letter corresponds to a single digit and identical letters correspond to identical digits. How many possible answers for A and B can you find?

Problem 20. Ivan has six $1 coins, two $2 coins and one $5 coin. In how many ways can he pay for a book that costs 10 dollars without having to get change?