



MATHEMATICS WITHOUT BORDERS

WINTER 2019

AGE GROUP 4

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. Find the missing number: $1300 - 1000 \div \circ = 800$

Problem 2. Calculate the following sum: $2 + 5 + 8 + \dots + 26 + 29$.

Problem 3. The dividend is 150, the divisor is 12, and the quotient is 12. What is the remainder?

Problem 4. Find the greatest four-digit number that is divisible by 7.

Problem 5. Find the smallest number made up of different digits, the sum of which is 31.

Problem 6. The product of the numbers 5, 6, 7, 8, 9, 10 and 11 is the number

$$\overline{\dots xy}.$$

Calculate $x + y$.

Problem 7. I know 133 children who were born in the same year. How many of these children were definitely born in the same month?

Problem 8. Place arithmetic symbols between the digits of the number 123 453 in such a way that after calculating the expression, the result would be 100. Write down the expression in the answer sheet.

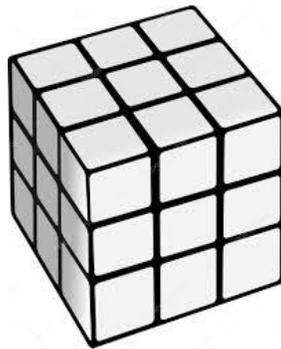
Problem 9. We have 10 keys and 10 suitcases. At least how many attempts do we need to make in order to match each key to each correct suitcase? (It is not necessary to open the suitcases)

Problem 10. There are 4 digits which correspond to the 4 letters A , B , C and D : 1, 2, 3 and 5. The digit that corresponds to the letter B is neither 1, nor 5; the digit that corresponds to the letter C is not 5, and the digit that corresponds to the letter A is an even number. Find the number $ABCD$.

Problem 11. Find the perimeter of a triangle in centimeters, if the sums of each two of its side lengths are respectively 5 dm , 34 cm and 360 mm .

Problem 12. Two beetles are moving along the sides of the rectangle $ABCD$. One of the beetles travels a distance of 30 cm from A to C , by going along AB first, and then along BC . The other beetle travels a distance of 43 cm from B to A by going along the sides BC , CD and DA . Find the shortest route from A to B in centimeters.

Problem 13. A cube is made up of 27 small white cubes.



Five of the faces of the large cube are colored in blue. How many of the small cubes have exactly 2 blue faces?

Problem 14. What is the minimum number of straight lines needed in order to form exactly 9 rectangles?

Problem 15. The line segment AB is 18 cm long. The point C is placed along this line segment and the length of the segment AC is 8 times greater than the length of the segment CB . The point M is the midpoint of the segment AC . Find the length of the segment MB in centimeters.

Problem 16. How many three-digit numbers are there, which are smaller than 300 and greater than 111, and where the sum of their digits is equal to 5?

Problem 17. By how many are the odd three-digit numbers more than the three-digit numbers that are made up of odd digits?

Problem 18. Ivan has seven \$1 coins, two \$2 coins and two \$5 coins. In how many ways can he pay for a book that costs \$10 without having to get any change?

Problem 19. A rectangle is made up of 18 sticks, each of which has a length of 1 cm . Find the number of rectangles that have different areas.

Problem 20. There are three bags full of sweets. The first bag contains 4 sweets less than the total number of sweets in the other two bags. The second bag contains 8 sweets less than the total number of sweets in the first and third bags. How many sweets are there in the third bag?