MATHEMATICS WITHOUT BORDERS
SPRING 2020
AGE GROUP 1

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. $1 + 2 + 3 + 4 - 1 - 2 - 3 = \square$

$$\square = ?$$

Problem 2. $16 - \square = 10 + \square.$

$$\square = ?$$

Problem 3.

$$2 \text{ tens} - 1 \text{ one} = ?$$

Problem 4. Place the numbers 1, 4 and 6 in the squares in such a way that the following would be true:

$$\blacksquare < \square > \blacksquare.$$

What is the sum of the numbers in the shaded squares $\blacksquare$?

Problem 5. $\square + 3 = \square\square + 1$

The sum of a one-digit number and the number 3 is equal to the sum of a two-digit number and the number 1. Find all possible two-digit numbers.

Problem 6. $\circ + \bullet + \square = 18;$

$$\circ + \bullet = 11$$

$$\square = \circ - 1$$

$$\bullet = ?$$

Problem 7. There are apples and yellow bananas in a fruit bowl. There are 10 apples in total, and 4 of them are yellow. There are 6 yellow pieces of fruit in total. What is the total number of fruit in the bowl?

Problem 8. How many numbers are missing?

$$1, 2, 3, \dots, 10, 11, 12, 13, 14, 15, \dots, 19, 20$$

Problem 9. The balloons shown below must be distributed among 3 children. Each child must get at least one balloon. How many balloons at most would the child with the most balloons have?

Problem 10. Find the missing number.

2, 1, 3, 4, 7, ?, 18, 29

Problem 11. Alex, Boris and Catherine each have one balloon of a different colour – blue, green, and yellow. Boris' balloon is neither yellow, nor blue. Catherine's balloon is not yellow. What colour is Alex's balloon?

Problem 12. I wrote down all two-digit numbers smaller than 23. How many times did I write down the digit 2?

22, 21, 20, ..., 11, 10

Problem 13. How many of the following expressions have a two-digit number as a result?

23 - 14; 16 + 4; 17 − 8; 0 + 10.

Problem 14. How many two-digit numbers have less than 2 tens?

Problem 15. I have 9 cubes of the same size – 2 blue, 3 green and 4 yellow. At least how many cubes should I pick up without looking in order to make sure there will definitely be two cubes of a different colour?

Problem 16. I added three different numbers greater than 2 and got 14 as a sum. One of the options is $3 + 5 + 6 = 14$. What is the other option? Write it down on the answer sheet.

Problem 17. Find the difference of the number of dots visible on the picture, and the number of dots which are not visible.

Problem 18. Which digit should we remove from 29 - 23 = 27 in order for the equation to be correct?

Problem 19. Find the greatest two-digit number that has 10 as a sum of its digits.
Example: The sum of the digits of the number 37 is 3 + 7 = 10.

Problem 20.
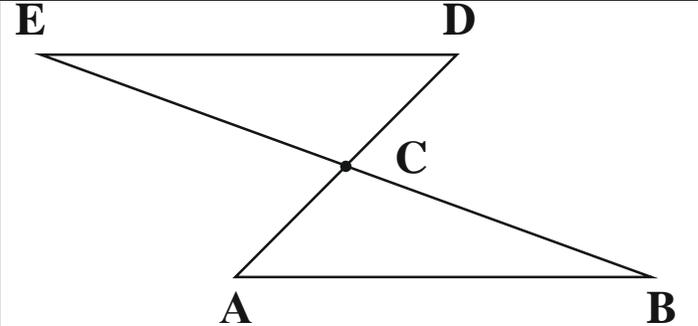
  There are 3 line segments here: *AC*, *CB* and *AB*.	 How many line segments are here?