



MATHEMATICS WITHOUT BORDERS
SPRING 2019
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.

$$2 + 4 + 6 + 8 - 16 = \square$$

$$\square = ?$$

Problem 2.

$$20 - \square = 4.$$

$$\square = ?$$

Problem 3. An ant collected 4 grains.

Another ant collected 2 grains more than the first ant.

A third ant collected as many grains as the first and second ant together.

What was the total number of grains collected?

Problem 4. The sum of a one-digit number and the number 3 is equal to the sum of a two-digit number and the number 2. Find the two-digit number.

$$\square + 3 = \square\square + 2$$

Problem 5.

$$\square = 3; \Delta = 5.$$

$$\square + 2 + \Delta - 3 = ?$$

Problem 6. There are apples and bananas in a fruit bowl. There are 6 apples in total, and 2 of them are yellow. There are 6 yellow pieces of fruit in total. What is the total number of fruit in the bowl?

Problem 7. How many numbers are missing?

$$1, 2, 3, \underbrace{\dots}_{?}, 11, 12, 13, 14, 15$$

Problem 8. The 8 balloons shown below must be distributed among 3 children. Each child must get a balloon. How many balloons at most would the child with the most balloons have?



Problem 9. Find the missing number.

0, 1, 3, 6, ?, 15, 21

Problem 10. Alex, Boris and Catherine each have one balloon of a different colour – blue, green, and yellow. Alex’s balloon is neither yellow, nor blue. Boris’ balloon is not yellow. What colour is Boris’ balloon?

Problem 11.

| | | |
|---|-------------------|---|
| <p>3 apples</p>  | are exchanged for | <p>1 banana</p>  |
| <p>1 banana</p>  | is exchanged for | <p>6 cherries</p>  |
| <p>1 apple</p>  | is exchanged for | <p>? cherries</p>  |

Problem 12. I wrote down all the numbers smaller than 15. How many times did I write down the digit 1?

14, 13, 12, ..., 3, 2, 1

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

$9 + 5$; $16 + 4$; $13 + 1$; $0 + 9$.

Problem 14. The difference of 2 numbers is equal to their sum: $\square + \blacksquare = \square - \blacksquare$

What number should we place instead of \blacksquare ?

Problem 15. I have 6 cubes of the same size – 2 blue, 2 green and 2 yellow. At least how many cubes should I pick up without looking in order to make sure there will definitely be two cubes of the same colour?

Problem 16. I added three numbers greater than 2 and got 11 as a sum. One of the options is $3 + 4 + 4 = 11$. What is the other option? Write it down on the answer sheet.

Problem 17. By how many are the visible dots more than the hidden dots?

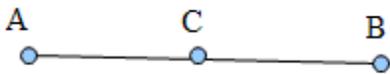


Problem 18. Which digit should we remove from $19 + 23 = 24$ in order for the equation to be correct?

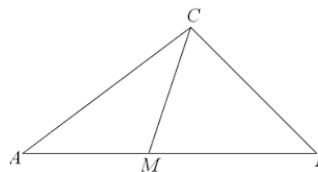
Problem 19. Find the smallest digit that has 10 as a sum of its digits.

Example: The sum of the digits of the number 23 is $2 + 3 = 5$.

Problem 20.



There are 3 line segments here.



How many line segments are here?