MATHEMATICS WITHOUT BORDERS

AGE GROUP 3

SPRING 2020

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. How many odd numbers are there from 196 to 226?

Problem 2. Calculate

1 hundred + 11 tens + 111 ones.

Problem 3. What digit should we replace * with?

$$9 * 1 + * 94 + \ 47 * = 2020$$

Problem 4. What number is behind the square □?

$$\square \times 8 + 16 = 8 \times 24$$

Problem 5. How many digits can we replace @ with, so that the four-digit number 20@0 would not be greater than 2020?

Problem 6. You are given a number. If you subtract the product of 25 and 9 from that number, you will get the product of 11 and 25. What is that number?

Problem 7. Find the number x if $4 \times x$ is a number between 30 and 43, and $6 \times x$ is a number between 56 and 69.

Problem 8. How many digits are used to write down the numbers from 2 to 122: 2, 3, …, 122?

Problem 9. How many of the symbols „+“ must be swapped with the symbol „×“, so that the equation below would be correct?

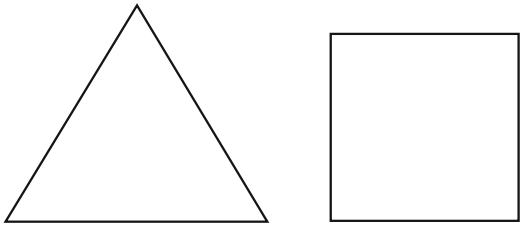
$$12 + 3 + 14 + 5 = 106$$

Problem 10. How many minutes should we subtract from 360 seconds in order to get 1 minute?

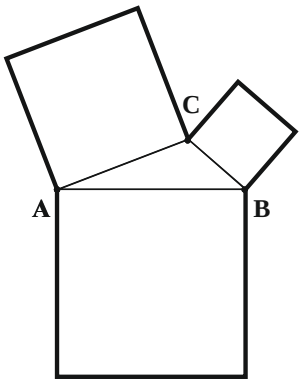
Problem 11. The digits 2, 4 and 7 have been used to form several two-digit numbers. The difference of two of them is 48. Find the subtrahend.

Problem 12. There are 3 green and 4 yellow points on a plane. I connected each two of them with a line segment. How many of these line segments have endpoints of the same colour?

Problem 13. A square and an equilateral triangle have the same perimeter – 108 cm. By how many cm is the side length of the triangle greater than the side length of the square?



Problem 14. The perimeter of the triangle *ABC* is 21 cm. Three squares have been drawn externally on the sides of the triangle. This has resulted in a new figure. Find the perimeter of the new figure in cm.



Problem 15. The sum of the perimeters of two squares is 152 cm. The side length of one of the squares is 2 cm greater than the side length of the other square. Find the smaller of the two perimeters in cm.

Problem 16. The distance between each two neighboring pillars in each row in a vineyard is the same. If the distance between the first and the fifteenth pillar in one of the rows is 14 meters, calculate the distance between the 7th and the 21st pillar in this row (in meters).

Problem 17. I have some sweets that I need to distribute among several children. If I give 5 sweets to each of the children, I will have 4 sweets left. If I give 6 sweets to each of them, I will have 1 sweet left. How many children are there?

Problem 18. At least how many digits should we remove from the expression $11 \times 12 \times ... \times 21 \times 22$, in order to get the smallest possible product?

Problem 19. The number *A* is the greatest three-digit number with 12 as the sum of its digits. The number *B* is the smallest three-digit number with 12 as the sum of its digits. By how much is the number *A* greater than the number *B*?

Problem 20. There is 1 zero in a three-digit number. If we remove it, the number would become 9 times smaller. Find the three-digit number.