ARCHIMEDES MATH COMPETITION

Second Round 2022-2023

Grade 5

Problem №1.

In the sequence of numbers shown below, each term is the **sum** of the two terms to its left.

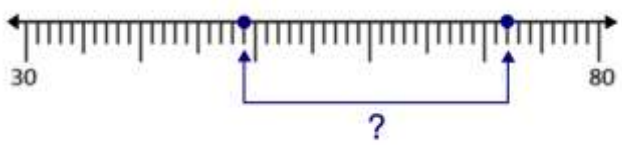
..., E, D, C, B, A, 10, 16, 26, 42, ...

What is the value of $A+B+C+D+E$?

Problem №2.

The arrows on the number line shown point to two numbers.

What is the **difference** between these two numbers?



Problem №3.

In the 3x3 magic square shown, the sums of the three numbers in each row, column, and diagonal are the same.Find the **sum** of the missing five numbers.

	9	
3		
8		6

Problem №4.

An Egyptian fraction is a finite sum of distinct unit fractions, such as

$\frac{11}{12} = \frac{1}{2} + \frac{1}{4} + \frac{1}{6}$. In this sum, each fraction has a numerator equal to 1, a denominator that is a positive integer, and all the denominators differ from each other. What is the value of $A+B+C$ in the expression shown below?

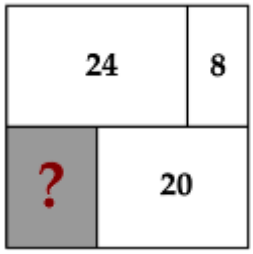
$$\frac{31}{30} = \frac{1}{A} + \frac{1}{B} + \frac{1}{C}$$

Problem №5.

In a class, 60% of the students are boys. 15% of the boys and 10% of the girls are left-handed. What percentage of the students in the class are right-handed?

Problem №6.

An 8-by-8 square was divided into four rectangles, each with whole number side lengths. The areas of three of these four rectangles are 24, 8, and 20, as shown. What is the **area** of the fourth rectangle?



Problem №7.

Find the value of the expression shown below:

1+2−3−4+5+6−7−8+9+10−11−12+...+301+302

Problem №8.

The number 2023 is a special four-digit number as it has the following properties:

- Its first digit is an even number.
- The two-digit number formed by the last two digits is a prime number greater than 20 and smaller than 30.

How many **four-digit numbers** have the same two properties?