



CYPRUS MATHEMATICAL SOCIETY
REGIONAL COMPETITION
NOVEMBER 2025

GYMNASIUM B'

Date: 08/11/2025

Time: 10:00 -12:00

INSTRUCTIONS

1. Solve all the problems, fully justifying your answers.
2. Each problem is worth 10 points.
3. Write with blue or black ink (shapes can be drawn with pencil).
4. The use of corrective liquid (Tipp-Ex) is not allowed.
5. The use of a calculator is not allowed.

PROBLEMS

Problem 1

Find all the three-digit numbers with the following properties:

- the digit of tens is equal to the sum of the digits of hundreds and units,
- the sum of all digits is 14.

Problem 2

a) Show that:

$$40 \cdot 2^{6v-7} + 11 \cdot 2^{6v-4} = 2^{6v}$$

b) Solve the equation:

$$2^{v^2} - 40 \cdot 2^{6v-7} - 11 \cdot 2^{6v-4} = 0$$

Problem 3

Each one out of Anna, Vasilis, George, and Danae thinks of a different prime number. The sum of the numbers of Anna and Vasilis is equal to the number of George. The sum of the numbers of Anna and George is equal to the number of Danae. Determine all possible numbers that Anna, Vasilis, George, and Danae could think of so that the above sentences are true.

Problem 4

The right triangle $AB\Gamma$ with $\hat{A} = 90^\circ$ is given. Let M and N be the midpoints of the sides $A\Gamma$ and AB respectively. If $\Gamma N = 2\sqrt{61}$ and $BM = \sqrt{601}$ calculate:

- a) The length of the hypotenuse of the triangle $AB\Gamma$,
- b) the area of the triangle $AB\Gamma$.