CYPRUS MATHEMATICAL SOCIETY
PANCYPRIAN COMPETITION
NOVEMBER 2025

GYMNASIUM B΄

Date: 13/12/2025 *Time: 09:30 -12:30*

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

If for the number α holds that $-\frac{1}{2} < \alpha < 0$, order the following numbers

$$\alpha, -\alpha, \alpha^3, -\alpha^3, \alpha^4, -\alpha^4, \frac{1}{\alpha}, -\frac{1}{\alpha},$$

from the smallest to the largest justifying your answer.

Problem 2

Find the smallest multiple of 35 that ends in 35 and whose sum of digits is equal to 35.

Problem 3

Let $AB\Gamma\Delta$ be a square. Let K be a point on the side AB, and Λ a point on the side $B\Gamma$ such that $KB = 4\ cm$ and $B\Lambda = 3\ cm$.

If the triangle $\Delta K\Lambda$ is a right-angled triangle at K, determine the length of ΔK.

Problem 4

Let $m = \sqrt{5 - 2\sqrt{3}}$ and $n = \sqrt{2\sqrt{3} - 3}$. Determine the value of the expression A, where

$$A = \frac{\sqrt{1 + mn}}{m + n}$$