# OLYMPIAD CORNER

No. 434

*The problems featured in this section have appeared in a regional or national mathematical Olympiad.*

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*To facilitate their consideration, solutions should be received by* **September 30, 2025**.

**OC736**. Solve in $\mathbb{R}$ the equation $[\log_2 x] = \sqrt{x} - 2$, where $[x]$ denotes the integer part of $x$.

**OC737**. Find all real solutions of the equation

$$7^{\log_5\left(x^2+\frac{4}{x^2}\right)} + 2\left(x + \frac{2}{x}\right)^2 = 25$$

**OC738**. Prove that for each $z \in \mathbb{C}$ the following inequality holds

$$|z^2 + 2z + 2| + |z - 1| + |z^2 + z| \geq 3.$$

When does the equality hold?

**OC739**. In triangle $ABC$ with $AB = AC$ let $I$ denote the incenter of the triangle. Line $BI$ meets the circumcircle a second time in point $D$. Find the measures of the angles of the triangle if $BC = ID$.

**OC740**. Find the 73rd digit from the end of $111\ldots1^2$, where the number of ones is 2012.