



MathLovers

Problems 12/04/2025
Solutions to the problems below
will be published on Monday, 12/08/2025

 **Problem 1.** Determine whether there exist positive real numbers a, b, c satisfying the conditions

$$\begin{cases} abc \leq (\sqrt{2} - 1)^3, \\ \frac{1}{a} + b < \sqrt{2} + 2, \\ \frac{1}{b} + c < \sqrt{2} + 1, \\ \frac{1}{c} + a < \sqrt{2}. \end{cases}$$

 **Problem 2.** Let $a, b, c > 0$ and $a + b + c = 3$. Prove that

$$\sqrt{\frac{a}{a+1}} + \sqrt{\frac{b}{b+1}} + \sqrt{\frac{c}{c+1}} \leq \frac{3\sqrt{3}}{2}.$$