



MathLovers

Problems 12/08/2025

The solutions to the problems below  
will be published on Thursday, 12/11/2025

**Problem 1.** Solve in positive real numbers  $x, y, z$  the system of equations:

$$\begin{cases} xy + xy^2z = 2 \\ yz + xyz^2 = 2 \\ zx + x^2yz = 2 \end{cases}$$

**Problem 2.** Find all polynomials  $P(x)$  with integer coefficients such that for every positive integer  $n$  we have  $P(n) > 0$  and  $P(P(n) + n)$  is a prime number.

*Good luck!*

We encourage you to submit your solutions via the website  
<https://mathlovers.eu/submit-solution/>!