



Problems — 11/6/2025
Solutions to the following problems
will be published on Sunday 11/9/2025

 **Problem 1.** Solve the system of equations:

$$\begin{cases} x + y = xy, \\ x^2 + y^2 = 10. \end{cases}$$

 **Problem 2.** Prove that there exist infinitely many positive integers n such that

$$\varphi(n) = \frac{n}{2}.$$

Note: $\varphi(n)$ denotes the number of integers $0 < k < n$ such that $\gcd(k, n) = 1$.

Good luck!

We encourage you to submit your solutions via our website:

<https://mathlovers.eu/submit-solution/>