Problems 12/22/2025
Solutions to the problems below
will be published on Thursday, 12/25/2025

Problem 1. All terms of a convergent infinite geometric sequence are nonzero. Prove that the ratio of any chosen term of this sequence to the sum of all terms that follow it is constant. Determine this constant ratio.

Problem 2. Nonzero real numbers a, b satisfy the condition

$$(a + b^2)(a^3 + b^3) = a^4 + b^5.$$

Prove that $b < 0$.

Good luck!