Lesson 3: More tilings and some algebra.

Konstantin Miagkov

May 4, 2019

Problem 1. What is the biggest number of $1 \times 4$ rectangles that can be fit into a $6 \times 6$ square without overlaps?

Problem 2. Ninety nine $2 \times 2$ squares were cut out of a $29 \times 29$ board. Prove that it is possible to cut out at least one more.

Problem 3. Prove that 8999999 is not a prime number.

Problem 4. Expand $(a + b - 2c)^3$.

Problem 5. Factor the following polynomials:
   a) $ac + ad + bc + bd$.
   b) $ac + bc - ad - bd$.
   c) $1 + a + a^2 + a^3$.
   d) $1 + a + a^2 + a^3 + \ldots + a^{14}$.
   e) $x^4 - x^3 + 2x - 2$. 