

Lesson 3: More tilings and some algebra.

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Problem 1.

What's the biggest number of 1×4 rectangles that can be fit into a 6×6 square without overlaps?

Problem 2.

99 2×2 squares were cut out of a 29×29 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) $1 + a + a^2 + a^3 + \dots + a^{14}$.

e) $x^4 - x^3 + 2x - 2$.