

Homework 3: More tilings and some algebra.

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Notation: From now on, $Lx.y$ will mean "Problem y from lesson x ". For example, L2.6 is problem 6 from handout titled "Lesson 2: tilings and colorings". Similarly, $Hx.y$ is problem y from homework x .

Problem 1.

Write down the solution for problem L2.6, which was discussed today in class.

Problem 2.

Pawns are initially located on an infinite square grid in a shape of an $n \times m$ rectangle, where n is divisible by 3. A following move is called *legal*: if a pawn is adjacent to another pawn, it can jump over it to the next square assuming the square it is jumping to was empty. After the jump, the pawn that was jumped over is discarded from the grid. Is it possible that after a series of legal moves there is only one pawn left on the grid?

Problem 3.

a) Factor $a^2 + 4ab + 4b^2$.

b) Prove that for all real a, b such that $a > 1$ and $b > 1$ we have $a+b < 1+ab$.