

# Homework 1: Induction I

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**Problem 1.**

Show that

$$1 + 4 + \dots + (3n - 2) = \frac{n(3n - 1)}{2}$$

**Problem 2.**

A 3D-septomino is a three-dimensional  $2 \times 2 \times 2$  cube with one  $1 \times 1 \times 1$  corner cube removed. A deficient cube is a  $k \times k \times k$  cube with one  $1 \times 1 \times 1$  cube removed.

Prove that a  $2^n \times 2^n \times 2^n$  deficient cube can be tiled by 3D-septominoes.