

Exam 4.

The solutions are due May 3rd. Either leave them in my mailbox or under my door, or send them by e-mail to my address (preferably in pdf).

1. Let M be the linear ordering resulting from attaching two copies of \mathbb{Z} next to each other, or in other words, the ordering on $\mathbb{Z} \times 2$ defined by $\langle n, i \rangle \leq \langle m, j \rangle$ if $i < j$ or $i = j$ and $n \leq m$. Explicitly construct an $L_{\omega_1\omega}$ sentence describing M up to isomorphism.

2. Let $c_0 \subset \mathbb{R}^\omega$ be the set of all sequences of real numbers converging to zero, with the norm given by $|x| = \max_n |x(n)|$ and the coordinatewise addition operation. Verify that c_0 is a Polish group. Consider the action of c_0 on \mathbb{R}^ω of coordinatewise addition. Prove carefully that this action is turbulent.