Exam 3.

The solutions are due April 24th before class. Either bring them to class, or send them by e-mail to my address (preferably in pdf).

1. Let G be a compact subgroup of S_∞. Show that for each number $n \in \omega$, the set $\{g(n)\colon g \in G\}$ is finite.

2. Conclude that the product of all finite permutation groups is a universal compact subgroup of S_∞.

3. If G is a locally compact Polish group acting continuously on a Polish space X, show that the orbit equivalence relation is F_σ.

4. Let E be the equivalence relation on the space $X = (2^\omega)^\omega$ connecting points x_0 and x_1 if for all $n \in \omega$, $x_0(n)$ and $x_1(n)$ are $\mathbb{E}_0$-related. Show that $\mathbb{E}_1$ is not Borel reducible to E.