DYNAMICAL SYSTEMS

Homework #5

Problem 1.

Let $f : [0,1] \to [0,1]$ be a homeomorphism of the interval $I = [0,1]$. Prove that $h_{top}(f) = 0$.

Problem 2.

Show (omit the technicalities, they can be tedious) that for any $a \in [0, +\infty]$ there is a homeomorphism $f : S^2 \to S^2$ such that $h_{top}(f) = a$.

Problem 3.

Let $\sigma : \Sigma_2 \to \Sigma_2$ be a topological Bernoulli shift. Give an example of a closed invariant subset $X \subseteq \Sigma_2$, $\sigma(X) = X$, such that $\sigma : X \to X$ is not a subshift of finite type.

Problem 4.

This problem will not be graded. Suggest (as many as you can, better at least three) problems on the topics covered (expanding maps of a circle, topological Markov chains, hyperbolic automorphism of a torus) that you would suggest for this homework. You do not need to provide solutions.