# Homework #2

#### Problem 1.

What is the number of periodic points of (not necessarily minimal) period 8 of the topological Markov chain  $\sigma_A$  given by the matrix

	/1	0	0	1	
A =	1	1	0	0	2
	0	1	1	0	:
	0	0	1	1/	

## Problem 2.

Is it possible to find a topological conjugacy between  $\sigma_3 : \Sigma_3 \to \Sigma_3$  and  $\sigma_2 : \Sigma_2 \to \Sigma_2$ ? Semiconjugacy?

### Problem 3.

Consider the following map of a torus  $f : \mathbb{T}^2 \to \mathbb{T}^2$ ,  $f(x, y) = (2x, 3y) \pmod{1}$ . Prove that f is topologically mixing, periodic points of f are dense in  $\mathbb{T}^2$ , and find the number of periodic points of (not necessarily minimal) period n for each  $n \in \mathbb{N}$ .

### 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.