Homework #6

Problem 1.

Give an example of a sequence $u \in \Sigma_2$ which is recurrent but not uniformly recurrent (i.e. not almost periodic for the shift $\sigma : \Sigma_2 \to \Sigma_2$).

Problem 2.

Let $f : X \to X$ be a homeomorphism of a compact metric space *X*. Prove that the set

$$\{x \in \omega(x) \text{ AND } x \in \alpha(x)\}$$

is nonempty.

Problem 3.

Let $f : X \to X$ be a transitive homeomorphism of a compact metric space *X*. Prove that for a given $x \in X$ either $\omega(x) = X$ or $\omega(x)$ is nowhere dense in *X*.

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.