DYNAMICAL SYSTEMS

Homework #1

Problem 1.

Is the product of two topologically transitive (minimal, topologically mixing) systems topologically transitive (minimal, topologically mixing)?

Problem 2.

Prove that the decimal expansion of the number 2^n may begin with any finite number of digits.

Problem 3.

Let $f : S^1 \to S^1$ be a continuous map of degree one that has a fixed point, $f(x_0) = x_0$ for some $x_0 \in S^1$. Assume also that f has a periodic point of prime period 3. Is it true that f must have periodic orbits of all periods? Prove or give a counterexample.

Problem 4.

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