Dynamical Systems

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Homework 2: More on the IVT and Chaos

Week 3

Mathcamp 2014

## Homework Problems.

- 1. Prove that if a continuous function has a point of period 3, it has a point of period 2 as well, as claimed in class.
- 2. Consider the following family of functions  $T_h: [0,1] \to [0,1]$ , known as the "cut-off tent functions:"

$$T_1(x) = \begin{cases} 2x, & x \in [0, 1/2] \\ 2 - 2x, & x \in [1/2, 1] \end{cases},$$
  
$$T_h(x) = \min(h, T_1(x)).$$

For what values of h does this map have no periodic points? For what values of h does this map contain points of every period? What happens to values of h in between these two values?