| Dynamical Systems | Instructor: Padraic Bartlett |
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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 $T_{h}:[0,1] \rightarrow[0,1]$, known as the "cut-off tent functions:"

$$
\begin{aligned}
& T_{1}(x)=\left\{\begin{array}{cc}
2 x, & x \in[0,1 / 2] \\
2-2 x, & x \in[1 / 2,1]
\end{array},\right. \\
& T_{h}(x)=\min \left(h, T_{1}(x)\right) .
\end{aligned}
$$

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?

