Honors 225 – Homework 4 – due Wednesday, March 24

1. Consider the quadratic function $f(x) = 4(x - x^2)$ and the corresponding dynamical system iterating $f$:

\[ x_{n+1} = f(x_n) = 4(x_n - x_n^2). \]

Find at least one value that lies in each of the subintervals LL, LR, RR, RL.

2. For the tent map $T$ (see text, page 28), list the corresponding symbol sequences for all the fixed points of the fourth iterate $T^4$ and identify for each of them what its period is and which other sequences are on the same orbit.

3. Again for the tent map, construct a sequence which is eventually period 3 but not period 3.

4. Again for the tent map, find the point which corresponds to the periodic sequence $LRLRLR \ldots$.

5. For the mapping $f(x) = x^2 - 3$, find the two fixed points and find which interval near 0 has orbits that tend to $\infty$. Hint: look at the fixed points and beyond, as we started to do in class.