

## Math 307 Supplemental Notes: Skinny Baker Map Summary

1. All orbits are bounded.
2. The Lyapunov exponents of all orbits are  $-\ln 3$  and  $\ln 2$ . (This means asymptotically periodic orbits are possible; each periodic orbit has an attracting direction.)
3. Since  $B$  is one-to-one, an orbit can not be eventually periodic unless it is periodic.
4. An orbit is asymptotically periodic if and only if the itinerary is eventually periodic to the right.
5. Therefore, a point whose itinerary is not eventually periodic to the right is not asymptotically periodic. For example, the orbit of the points whose itinerary is  $\dots LR.LLLRRLRRRLRRRRL\dots$  is not asymptotically periodic.
6. Therefore, the skinny baker map  $B$  has chaotic orbits.