

Math 388 Exercises

Instructions: not to be turned in, but do it anyway!

1. Use iterates to demonstrate that the Hénon map $(1.4 - x^2 - 0.3y, x)$ has an attracting 2-cycle.
2. Find all fixed points of the map in problem #1.
3. Find all fixed points of the Hénon map $(-x^2 + 0.4y, x)$.
4. From Figure 2.10(a) on page 61, determine whether the origin is a sink or source for the map in #3.
5. Iterate the Hénon map $(2 - x^2 - 0.3y, x)$ starting at $(0, 1)$ and determine what the long-run behavior is. What does this tell you about the location of $(0, 1)$ in Figure 2.11 on page 61?
6. Repeat #5 with the starting point $(0, 2)$.
7. Based on your results in #5 and #6, what does it mean for the "hairpin" in Figure 2.11 to be an attractor? Explain what it means in the caption of Figure 2.11 when it says that "the points on one piece of the attractor map to the other piece."