

Math 388 Exercises

Instructions: use Mathematica to draw the bifurcation diagram. Due Tuesday.

1. Show that $f(x) = x^2 - 2$ is a map on $[-2, 2]$.
2. Draw a bifurcation diagram for the family $f(x) = x^2 - c$. Use the results of the previous homework to choose a good value of a for using $a \leq c \leq 2$ in your diagram.
3. From the previous homework, what are the first two bifurcation points; that is, for what values of c does the curve split?
4. Sketch the tent function defined in exercise 1.7 on page 36. How does its graph compare to that of $y = 4x(1 - x)$ on $[0, 1]$?
5. Prove that the tent function has sensitive dependence on initial conditions at all values of x .