Quiz 1 Review problems

1. Write down a careful definition of each of the following.
   (a) Sensitive dependence on initial conditions
   (b) The logistic function
   (c) Malthus' function
   (d) Fixed point of a function
   (e) Periodic orbit of a function
2. Suppose that $f(x) = x^2 - 1$. Perform 5 iterates of f from $x_0 = 1$.
3. The graph in figure 1 shows a function plotted over the interval $0 \leq x \leq 1$. It has three fixed points in that interval.
   (a) *Approximately* what are those fixed points?
   (b) Which of your fixed points from part (a) are attractive and which are repulsive?
   (c) Perform graphical analysis from the point $x_0 = 0.4$. What is the long term behavior?

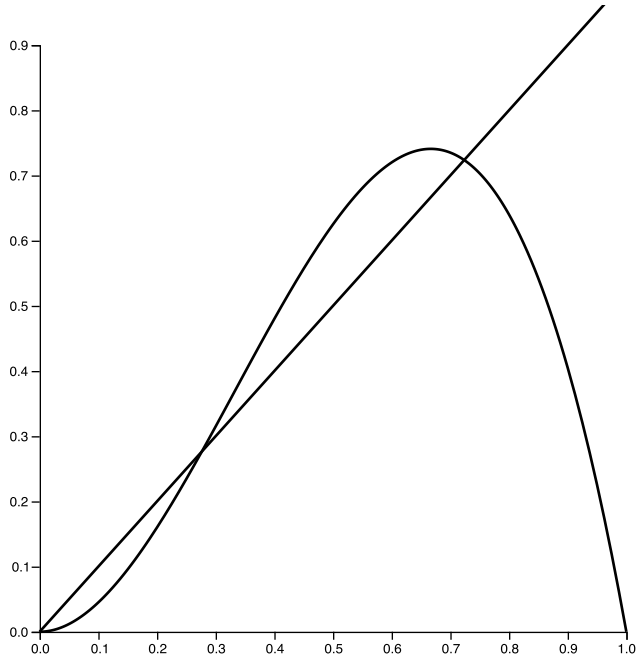

Figure 1: The graph of a function f over $[0, 1]$