Homework assigned Wednesday, February 1.

Read pages 35–37 in the text on discrete logistic growth.
The corresponding equation is

$$N_{t+1} = N_t + rN_t\left(1 - \frac{N_t}{K}\right)$$

where r is the per ***capita growth*** rate and K is the ***carrying capacity***. The equilibrium points are

$$N_* = 0, \qquad \text{and} \qquad N_* = K.$$

Theorem 1. *For the discrete logistic equation, the equilibrium point $N_* = 0$ is always unstable and the equilibrium point $N_* = 0$ is stable when $0 < r < 2$ and unstable when $2 < r$.*

(1) If a population of birds on an island grows with $r = 2.5$ and $K = 100$, if the initial population size if $N_0 = 80$ then find N_1, N_2 and N_3. Does this population every settle down to a stable population size?
(2) Consider the system

$$N_{t+1} = .6N_t(1 + .5N_t^4)e^{-N_t}.$$

   (a) If $N_0 = 4$ find N_1 and N_2.
   (b) Plot $y = .6x(1 + .5x)e^{-s}$ and $y = x$ on the same window on your calculate with $0 \le x \le 10$. Use the `2nd calc intersect` function to find the equilibrium points.
   (c) Which of the equilibrium points are stable?