Mathematics 172

Quiz #13 Name: Key

You must show your work to get full credit.

Define a discrete dynamical system by

$$N_{t+1} = N_t + .6N_t\left(1 - \frac{N_t}{50}\right)$$

1. If $N_0 = 60$ find N_1, N_2, N_3,

$N_1 = 60 + .6(60)(1 - \frac{60}{50}) = 52.8$ $N_1 =$ 52.8

$N_2 = (52.8) + .6(52.8)(1 - \frac{52.8}{50})$ $N_2 =$ 51.0259

$= 51.0259$ $N_3 =$ 50.39773

$N_3 = (51.0259) + .6(51.0259)(1 - \frac{51.0259}{60})$

$= 50.39773$

2. Find all the equilibrium points of the system (these are the solutions to the equation $f(N) = N$).

Equilibrium points are 0, 50

I used [2nd] calc 5: intersect to find the 50. 0 was clear from the graph