

Mathematics 172

Quiz 17

Name: Key

You must show your work to get full credit.

1. (a) Write the discrete logistic equation for N_t with per capita growth rate $r = .3$ and carrying capacity $K = 200$. *Hint:* It is an equation so it has an equal sign in it.

The equation is $N_{t+1} = N_t + .3 N_t \left(1 - \frac{N_t}{200}\right)$

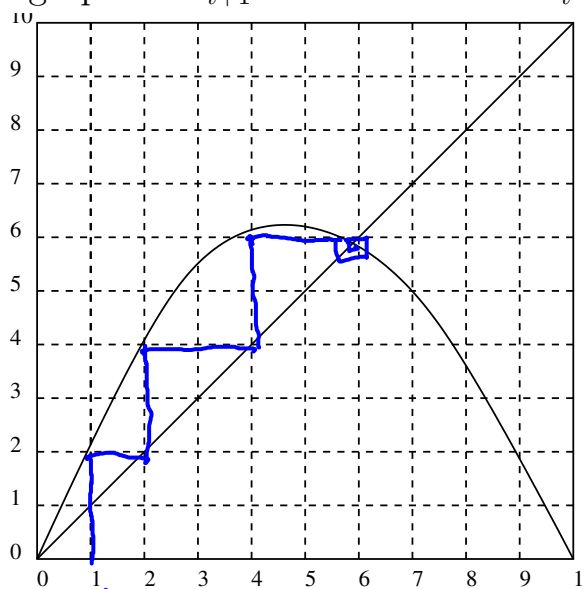
- (b) If $N_0 = 220$ compute N_1 and N_2 .

$N_1 =$ 213.4 $N_2 =$ 209.11

$$N_1 = 220 + .3(220)\left(1 - \frac{220}{200}\right) = 213.4$$

$$N_2 = 213.4 + .3(213.4)\left(1 - \frac{213.4}{200}\right) = 209.11$$

2. The figure shows the graph of N_{t+1} as a function of N_t .



If $N_0 = 1$, estimate the following N_1 N_2 N_3

$N_1 \approx$ 2

$N_2 \approx$ 4

$N_{25} \approx$ 6