Quiz 6

Name: Key

You must show your work to get full credit.

We shown that if a population has a finite intrinsic growth rate of r and a carrying capacity of K, then one reasonable model for the population growth is

$$P_{t+1} = P_t + rP_t\left(1 - \frac{P_t}{K}\right).$$

Assume that $r = .2$ and $K = 10$.

1. Write out the logistic equation for these values of r and K.

The equation is $\quad P_{t+1} = P_t + .2P_t\left(1 - \frac{P_t}{10}\right)$

2. If we start with a population of size $P_0 = 13$ then what are the population sizes in the next three years? Give your answer to three decimal places.

$$P_1 = 13 + .2(13)\left(1 - \frac{13}{10}\right)$$
$$= 12.220$$

$$P_2 = 12.22 + .2(12.22)\left(1 - \frac{12.22}{10}\right)$$
$$= 11.677$$

$$P_3 = 11.677 + .2(11.677)\left(1 - \frac{11.677}{10}\right)$$
$$= 11.285$$

$P_1 = \underline{\quad 12.220 \quad}$

$P_2 = \underline{\quad 11.677 \quad}$

$P_3 = \underline{\quad 11.285 \quad}$