Mathematics 172

Quiz #6 Name: Key

You must show your work to get full credit.

A species of duck has an annual birth rate of $b = 1.3$ ducks/duck and an annual death rate of $d = .4$ ducks/duck.

1. What is the discrete growth factor, r? $r =$ .9

$r = b - d = 1.3 - .4 = .9$

2. What is the finite rate of increase, λ? $\lambda =$ 1.9

$\lambda = 1 + r = 1.9$

3. If a flock starts with 20 ducks, then how many are there t years later?

$N_t = N_0 \lambda^t$

and $N_0 = 20$

$\lambda = 1.9$

$N_t =$ $20(1.9)^t$

4. How many ducks are there after 30 years? (This is another problem showing how fast exponential functions grow.)

$N_{30} = 20(1.9)^{30} =$

$N_{30} =$ 4,609,332,356

(over 4 billion ducks)