Mathematics 172

Quiz 3 Name: Key

You must show your work to get full credit.

Assume that 100 mosquito fish are introduced into a deserted swimming pool to control mosquitoes and that the intrinsic growth rate for the mosquito fish in the pool $r = 0.3465$ (fish/fish)/week.

1. Give a formula for the number, $N(t)$, of mosquito fish in the pond after t weeks.

$N(t) = N_0 e^{rt} = 100 e^{.3465t}$

$N(t) =$ $100 e^{.3465t}$

2. What is the number of mosquito fish in the pool after 6 weeks?

$N(6) = 100 e^{.3465(6)}$

$= 799.64$

$N(6) =$ 800

After 6 weeks some neighborhood kids introduce some bluegill into the pond so that they will have a local fishing hole. Assume that the bluegill eat the mosquito fish at the rate of .15 (fish/fish)/week.

3. What is the new rate equation for $N(t)$?

$\frac{dN}{dt} = .3465N - .15N$

$= .1965N$

The rate equation is $\frac{dN}{dt} = .1965N$

4. How many mosquito fish are there in the pool 8 weeks after the bluegill are introduced?

Number of mosquito fish is 3853

$N(8) = 800 e^{.1965(8)}$

$= 3853.0$