Mathematics 172

Quiz 12 Name: Key

You must show your work to get full credit.

Algae is being grown in a tank to feed water fleas (Scientific name: Daphnia) which in turn will be used to feed small fish). If no algae is added to the tank, the water fleas 10% of the algae in the tank each day. Let $P(t)$ is the number of grams of algae in the tank after t days.

1. Write the rate equation satisfied by P.

$\frac{dP}{dt} = -.1P$

2. Assume that it is desired to have 60 grams of algae in the tank. At what rate, S, should algae be added to the tank to achieve this.

Stocking rate is $S =$ 6 grams/day

The new rate equation is $\frac{dP}{dt} = -.1P + S$

The eqm. pt is found by setting

$-.1P + S = 0$

$.1P = S$

$P = \frac{S}{.1} = 10S$ is

stable eqm pt. we want $10S = 60$

so $S = \frac{60}{10} = 6.$