

Mathematics 122

Quiz #29

Name: Key

You must show your work to get full credit.

Ten rabbits are released on a small island and a biologist takes a census every three months for the first year. Here are her results:

t	0	3	6	9	12
P	10	42	145	323	445

where t is the time in months since the release and P is the size of the rabbit population on the island.

(1) Make a table for the rate of change of the rabbit population.

2 pts

t	1.5	4.5	7.5	10.5
P'	10.7	34.3	59.3	40.7

(2) What is the number of rabbits at the point of diminishing returns?

2 pts

This is the number of rabbits when $t = 7.5$

234

$$\text{so } \approx \frac{145 + 323}{2} = 234$$

(3) Estimate the carrying capacity, L , of the island.

1 pt

This is twice the number at the point of diminishing returns

$L \approx$ 468

$$= 2(234) =$$

(Give credit if this is twice answer in (b).)