Quiz #4   Name: ___Key___

You must show your work to get full credit.

Twenty bears are introduced into a large park. Assume that the population of these bears grows exponentially and that five years after the bears are introduced there are twenty eight of them in the park.

1. Give a formula for the number, N, of the bears in the park t years after they were introduced.

$N_t = N_0 \lambda^t = 20\lambda^t$

$N_5 = 20\lambda^5 = 28$

so $\lambda^5 = 28/20$

$\lambda = (28/20)^{\frac{1}{5}} = 1.0696$

$N_t = $ ___$20(1.0696)^t$___

2. How many bears are there after ten years?

Number after ten years ___39.196 bears___
                                    (or just 39)

$N_{10} = 20(1.0696)^{10} = 39.1$

3. How long until there are 100 bears.

We want to   How long to get 100 ___23.9 years.___
solve

$20(1.0696)^t = 100$

$(1.0696)^t = 100/20$

$t \ln(1.0696) = \ln(100/20)$

$t = \dfrac{\ln(100/20)}{\ln(1.0696)} = 23.9$ years