Mathematics 122

Quiz #4   Name: _____Key_____

You must show your work to get full credit.

(1) Explain why the following function could be an exponential function. (This will involve both doing some calculations and writing an English sentence explaining why these calculations are relevant.)

t	0	1	2	3
$P(t)$	1.5	3.15	6.615	13.8915

$a = $ ratio $= \dfrac{P(t+1)}{P(t)}$ $\dfrac{3.15}{1.5}$ | $\dfrac{6.615}{3.15}$ $\dfrac{13.8915}{6.15}$

$\parallel$ $\parallel$ $\searrow 2.1$

2.1 2.1

The ratios are constants so it is an exponential function

(2) Give a formula for $P(t)$. $P(t) = $ ____$1.5(2.1)^t$____

$P(t) = P_0 a^t = 1.5(2.1)^t$

(3) What is the doubling time of $P(t)$?   ____$.9342$____

solve

$1.5(2.1)^t = 2(1.5)$

$(2.1)^t = 2$

$t \ln(2.1) = \ln(2)$

$t = \dfrac{\ln(2)}{\ln(2.1)} = .9342$