Mathematics 172

Quiz 2 Name: Key

You must show your work to get full credit.

1. Explain why the data

t	0	1	2	3	4
P_t	61.00	70.15	80.67	92.77	106.69

is consistent with an exponential model. This both computing some numbers and writing at least one sentence that explains why these numbers show the model is exponential.

The ratios are

$\frac{P_1}{P_0} = \frac{70.15}{61.00} = 1.15$

$\frac{P_2}{P_1} = \frac{80.67}{70.15} = 1.15$

$\frac{P_3}{P_2} = \frac{92.77}{80.67} = 1.15$

$\frac{P_4}{P_3} = \frac{106.69}{92.77} = 1.15$

all rounded to 2 decimal places

The ratios are constant, thus it is exponential

2. Give a formula for P_t. $P_t = P_0\lambda^t = 63(1.15)^t$

$P_0 = 63$

$\lambda = \text{ratio} = 1.15$

3. Use your formula to make a prediction for the value P_7. $P_7 = 167.58$

$P_7 = 63(1.15)^7 = 167.58$