Name _____ Date _____ Pd ___

6.1 Exponential Regression DAY TWO CYU

☑ *Use when you get it right all by yourself*

S *Use when you did it all by yourself, but made a silly mistake*

H *Use when you could do it alone with a little help from teacher or peer*

G *Use when you completed the problem in a group*

X *Use when a question was attempted but wrong (get help)*

N *Use when a question was not even attempted*

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Real World Application	1 – 4		
Exponential growth vs decay	1 – 4		
Prediction		1 – 4	
Creating exponential regression	1 - 4		
Growth or Decay Rate		5 - 10	

1. **MODELING WITH MATHEMATICS** The value of a mountain bike y (in dollars) can be approximated by the model $y = 200(0.75)^t$, where *t* is the number of years since the bike was new.

   a) Tell whether the model represents exponential growth or decay.

   b) Identity the annual percent increase or decrease in the value of the bike.

   c) Estimate when the value of the bike will be $50.

2. **MODELING WITH MATHEMATICS** The population P (in thousands) of Austin, Texas, during a recent decade can be approximated by $y = 494.29(1.03)^t$, where *t* is the number of years since the beginning of the decade.

   a) Tell whether the model represents exponential growth or decay.

   b) Identify the annual percent increase or decrease in population.

   c) Estimate when the population was about 590,000.

3. **MODELING WITH MATHEMATICS** In 2006, there were approximately 233 million cell phone subscribers in the United States. During the next 4 years, the number of cell phone subscribers increased by about 6% each year.

   a) Write an exponential growth model giving the number of cell phone subscribers y (in millions) *t* years after 2006. Estimate the number of cell phone subscribers in 2008.

   b) Estimate the year when the number of cell phone subscribers was about 278 million.

4. **MODELING WITH MATHEMATICS** You take a 325 milligram dosage of ibuprofen. During each subsequent hour, the amount of medication in your bloodstream decreases by about 29% each hour.

a) Write an exponential decay model giving the amount y (in milligrams) of ibuprofen in your bloodstream *t* hours after the initial dose.

b) Estimate how long it takes for you to have 100 milligrams of ibuprofen in your bloodstream.

Rewrite the function in the form $y = a(1 \pm r)^t$. *Then state the growth or decay rate.*

5. $y = a(1.26)^t$

6. $y = a(1.26)^t$

7. $y = a(0.94)^t$

8. $y = a(0.86)^t$

9. $y = a(0.96)^t$

10. $y = 1.01^t$

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*

Rate your mastery level!

How confident are you with the skills this CYU covered? Circle the score you would give yourself.