

**Student Practice – Writing Exponential Functions Using Regression**

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Use an exponential regression to write the function rule for each. Determine if the equation models a growth or decay and answer the following questions. Round to the nearest hundredth.**

1.

<b>x</b>	1	2	3	4
<b>y</b>	2	1	0.5	0.25

Function Rule: \_\_\_\_\_

Exponential Growth/Decay (*Choose one*)

- A. What is the value of y when x is -3?
- B. What is the value of x when y is 32,768?

2.

<b>x</b>	2	3	4	5
<b>y</b>	0.85	0.25	0.08	0.02

Function Rule: \_\_\_\_\_

Exponential Growth/Decay (*Choose one*)

- A. Evaluate  $f(-5)$ .
- B. What is the value of x when y is 123.56?

3.

<b>x</b>	-1	1	3	4
<b>y</b>	0.71	22.4	702.46	3933.8

Function Rule: \_\_\_\_\_

Exponential Growth/Decay (*Choose one*)

- A. What is the y-intercept of the function?
- B. Evaluate  $f(-2)$ .

4.

<b>x</b>	-5	-4	-3	-2
<b>y</b>	1024	256	64	16

Function Rule: \_\_\_\_\_

Exponential Growth/Decay (*Choose one*)

- A. Evaluate  $f(-8)$ .
- B. What is the value of x when y is 1? What is another name for this point?

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5. The following table represents the population growth since 2000.

<b>Years since 2000</b>	4	8	12	16
<b>Population</b>	336	5,376	86,016	1,376,256

Function Rule: \_\_\_\_\_

Exponential Growth/Decay (*Choose one*)

- A. What was the initial population in 2000?
- B. What was the population in 2013?

6. The following table demonstrates the value of a car after its purchase.

<b>Years since purchase</b>	1	2	3	4
<b>Value (\$)</b>	22,080	20,314	18,689	17,193

- A. Use an exponential regression to calculate the function rule. Is it a growth or decay model?
- B. What is the initial value of the car?
- C. After how many years is the car first worth less than \$15,000?

8. The data below show the length of a Gila monster during the beginning of its life.

<b># of weeks since birth</b>	1	2	3	4
<b>Length (cm)</b>	19.2	23.04	27.65	33.8

- A. Use an exponential regression to calculate the function rule. Is it a growth or decay model?
- B. Predict the length of the Gila Monster after 2 months.

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9. Every hour that Ibuprofen is in your system, the medicine dissolves exponentially.

<b>Time (hr)</b>	1	2	3	4
<b>Medicine in body (mg)</b>	600	450	337.50	253.13

- A. Write a function that models the amount of Ibuprofen remaining in your body.
  
- B. What is the initial dosage taken?
  
- C. It is safe to retake medicine when there is less than 200 mg left in the body. How long before you can take more medicine?



10. What are some of the characteristics of exponential growth and decay functions?