Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Hour\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Final Study Guide for Exponential Unit**

**Determine whether each of the following situations models an exponential function. Explain using a complete sentence.**

1. Stacy is working at the mall. Her manager gave her a raise of 0.25 cents, so now she makes $10.25 an hour.

This (is/isn’t) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an exponential function because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. The population of Stars Hallow is 1500 people. The population is increasing at a rate of 4% every year.

This (is/isn’t) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an exponential function because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3.

|  |  |
| --- | --- |
| x | y |
| -2 | 5 |
| -1 | 10 |
| 0 | 15 |
| 1 | 20 |

 | This (is/isn’t) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an exponential function because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 4.

|  |  |
| --- | --- |
| x | y |
| -2 | 5 |
| -1 | 25 |
| 0 | 125 |
| 1 | 625 |

 | This (is/isn’t) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an exponential function because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

5. Make a double bubble comparing and contrasting #3 and #4. Use the words “linear” and “exponential”. Explain not only the table, but the graph.

Evaluate the following:

|  |  |
| --- | --- |
| 6. $y=2(1.4)^{x} for x=5$ | 7. $y=1.5(0.65)^{x}$ for x=2 |
| For each of the following situations, determine if it represents an exponential growth or decay and then identify the percentage rate of change. |
| 8. $y=2(1.4)^{x}$Exponential Growth or Decay \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(show work here:)% rate of change: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 9. $y=1.5(0.65)^{x}$ forExponential Growth or Decay \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(show work here:)% rate of change: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |

10. The yearly value of a car after it is purchased is modeled by the equation $y=15,000(0.45)^{x}$

**Explain what each number and variable would represent:**

x: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

y: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15,000: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

0.45: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. A company buys new furniture for the office for $6000. The tax value is found by knowing that it decreases in value 7% each year.

a) Find the equation that would model this situation.

b) How much would the furniture be worth after 3 years?

12. A population in 2012 had 4000 people. It’s increasing at 5%.

a) Find the equation that would model this situation

b) How many people would be in the town in 2017?