Unit 4 Review Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Match each characteristic to the correct graph shown. Write the letter in the box below the correct graph. (1 point each)

Each graph will have 4 correct characteristics.

Some characteristics may be used more than once or not at all.

|  |  |  |
| --- | --- | --- |
| A) asymptote: $y=-1$ | B) asymptote: $y=0$ | c) asymptote: $y=3$ |
| D) Domain: $(-\infty , \infty )$ | E) End behavior:As $x\rightarrow -\infty , f\left(x\right)\rightarrow \infty $As $x\rightarrow \infty , f\left(x\right)\rightarrow -1$ | F) Interval of Decrease: none |
| G) Negative Interval: none | H) Positive Interval: $(-\infty ,1)$ | I) Range: $(-1, \infty )$ |
| J) y-intercept: $\left(0, 1\right)$ | K) y-intercept: $\left(0, 2\right)$ | L) y-intercept: $(0, 3)$ |

|  |  |  |
| --- | --- | --- |
|  |  |  |
| WRITE THE LETTERS OF THE CHARACTERISTICS HERE: | WRITE THE LETTERS OF THE CHARACTERISTICS HERE: | WRITE THE LETTERS OF THE CHARACTERISTICS HERE: |
|  |  |  |  |  |  |  |  |  |  |  |  |

Graph each exponential function.

2. $y=\frac{1}{2}(2)^{x}+1$ 3. $y=2\left(\frac{1}{3}\right)^{x+1}$

|  |  |
| --- | --- |
| $$x$$ | $$y$$ |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

|  |  |
| --- | --- |
| $$x$$ | $$y$$ |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

4. The flamingo population at the zoo was 38 in 2002 and is increasing at an annual rate of 2.3%. If this growth rate continues, what will the approximate population of flamingos be in the year 2020?

5. How does the graph of the function $y=3^{x-4}$ compare to the parent function $y=3^{x}$?

6. The growth pattern of the Gremlin population can be described by the function $y=4(2)^{x}$, where x is the number of days.

Which statement describes this situation?

1. The number of Gremlins multiplies by 4 each day.
2. The number Gremlins is divided by 2 each day.
3. On the first day, the number of Gremlins was 4.
4. On the first day, the number of Gremlins was 2.

7. Which of the following is a geometric sequence? SELECT ALL THAT APPLY

* 12, 10, 8, 6, …
* 1, -2, 4, -8, …

Find the common ratio for each geometric sequence you checked.

* 3, 6, 9, 12, …
* 3, 6, 12, 24, …
* 64, 32, 16, 8, …
* 10, 20, 30, 40, …
* 28, -14, 7, -3.5, …

8. What is the rate of change over the interval $0\leq x\leq 1$?

a. b. c. $f\left(x\right)=2(4)^{x}$

|  |  |
| --- | --- |
| $$x$$ | $$y$$ |
| -2 | .0625 |
| -1 | .25 |
| 0 | 1 |
| 1 | 4 |
| 2 | 16 |

9. Cedric has 2 imaginary friends. Each day the number of imaginary friends triples.

Day 1 Day 2 Day 3









a. Write the first 5 terms of the sequence: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b. Write an explicit rule for the sequence.

c. How many imaginary friends will Cedric have after 10 days?

10. Describe the transformations on the parent function, given the transformed function.

|  |  |
| --- | --- |
| Parent Function | Transformed Function |
| $$y=\left(\frac{3}{2}\right)^{x}$$ | $$y=-2\left(\frac{3}{2}\right)^{x+7}-3$$ |

11. The recursive formula for a geometric sequence is $a\_{n}=6(a\_{n-1})$ where $a\_{1}=\frac{1}{2}$.

 What are the first 5 terms of the sequence?

12. Given the function $f(x)=2500(.42)^{x}$, determine the following:

 a. Growth or Decay

 b. Growth/Decay Rate

 c. $f(10)$

13. Given the geometric sequence 3, -15, 75, -375, …

 a. Write an explicit equation to represent the sequence.

 b. Find $a\_{7}$

14. Describe the transformations of the function $f\left(x\right)=3^{x}$ to create the function $g\left(x\right)$ shown.



15. Jimmy deposits $3500 in an account that earns 3.2% interest per year.

1. Write an exponential function to represent the scenario.
2. How much money will he have in this account after 5 years?

SOLUTIONS:

1. C, D, H, K A, D, E, I D, F, G, L
2. See graph
3. See graph
4. 57 flamingos
5. Shift horizontally 4 units right
6. C.
7. 1, -2, 4, -8, … r = -2

3, 6, 12, 24, … r = 2

64, 32, 16, 8, … r = ½

28, -14, 7, -3.5, … r = - ½

1. a) 3 b) 2 c) 6

9. a) 2, 6, 18, 54, 162 b) $a\_{n}=2(3)^{n-1}$ c) 39,366 imaginary friends

10. reflection over the x-axis, stretch by a factor of 2, shift left 7 units and down 3

11. ½, 3, 18, 108, 648

12. a) Decay b) 58% c) f(10) = 0.427