Name: _____

Review – Sequences & Exponential Functions

Use inductive reasoning to describe each pattern, and then find the next two numbers in each pattern.

1. 3, 1, -1, -3, _____, _____

Find the common difference of the arithmetic sequence and then find the next two numbers in sequence.

2. -5, -2, 1, 4, _____, _____

Write the function rule for the arithmetic sequence.

3. -9, -4, 1, 6

_____

Find the first, second, fifth, and ninth terms of the sequence.

4. $A(n) = -9 + (n-1)(6)$

For 5 & 6:

Find the next two terms in the sequence, explain if it is an arithmetic sequence or not.
If the sequence is arithmetic, write the function. If is not arithmetic, describe the pattern.

5. 12, -4, $\frac{4}{3}$, $-\frac{4}{9}$, _____, _____

6. 7, $7\frac{1}{4}$, $7\frac{1}{2}$, $7\frac{3}{4}$, _____, _____

For 7 & 8:
Write the first five terms of the sequence, and explain what the fifth term means in the context of this situation.

7. A baby's birth weight is 7 lbs. 4 oz., the baby gains 5 oz. each week.

8. The balance of a car loan starts at $4,500 and decreases $150 each month.

9. Find the second, fourth, and eighth terms of the sequence.

$$A(n) = \frac{1}{5} + (n-1)\left(\frac{4}{5}\right)$$

10. The Fibonacci Sequence is 1, 1, 2, 3, 5, 8, 13, … Find the next two terms in the sequence, explain if it is an arithmetic sequence or not. If the sequence is arithmetic, write the function. If is not arithmetic, describe the pattern.

Use inductive reasoning to describe each pattern, and then find the next two numbers in each pattern.

11. -8, -4, -2, -1, _____, _____

Find the common ratio of the geometric sequence and then find the next two numbers in sequence.

12. 3, 6, 12, 24, _____, _____

Write the function rule for the geometric sequence.

13. 8, 20, 50, 125, …

_____

Find the first, second, fifth, and ninth terms of the sequence.

14. $A(n)=5\cdot(3)^{n-1}$

For 15 & 16:
Determine whether each sequence is arithmetic or geometric. Determine the next two terms. Write the function rule.

15. 20, 5, $\frac{5}{4}$, $\frac{5}{16}$, _____, _____

16. 10, 7, 4, 1, _____, _____

17. Find the second, fourth, and eighth terms of the sequence.

$A(n) = -1.1\,(-4)^{n-1}$

18. On the first swing, a pendulum swings through an arc of length 36cm. On each successive swing, the length of the arc is 90% of the previous arc. Write a function rule to model the situation. What is the length of the arc on the sixth swing to the nearest cm?

19. Complete the tables below, and write a function rule for each exponential function.

Investment increases by 1.5 times every 5 yr.

Time	Value of Investment
Initial	$800
5 yr	$1200
10 yr	$1800
15 yr	$2700
20 yr	
25 yr	

Function rule: _____

The amount of matter halves every year.

Time	Amount of Matter
Initial	3200 g
1 yr	1600 g
2 yr	800 g
3 yr	

Function rule: _____

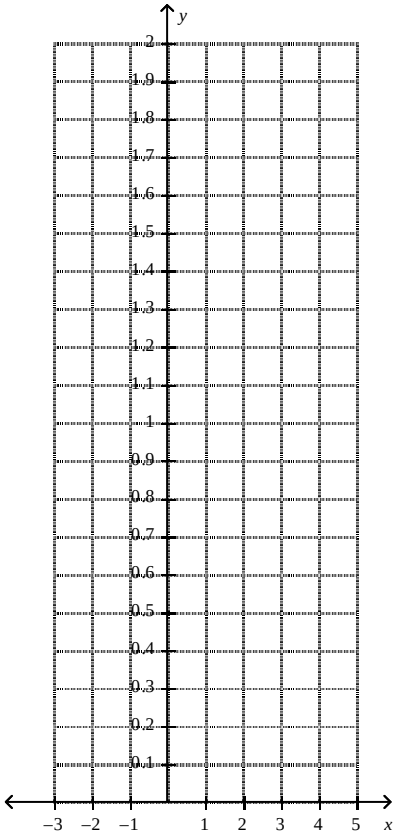
20. Suppose two mice live in a barn. The number of mice quadruples every 3 months. The function $f(x) = 2 \cdot 4^x$ models this situation. How many mice will be in the barn after 2 years?

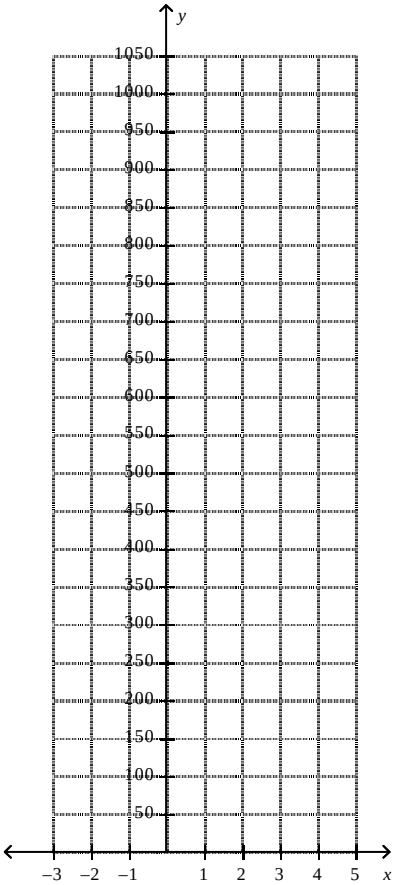
For questions 21 & 22, graph each function over the domain $\{-2 \le x < 4\}$.

Determine if the function represents growth or decay.

21. $y = 0.8^x$

22. $y = \frac{1}{4} \cdot 8^x$





For questions 23-26, write an exponential function to model each situation. Find each amount after the specified time.

23. The tax revenue that a small city receives increases by 3.5% per year. In 1990, the city received $250,000 in tax revenue. Determine the tax revenue in 1995 and in 2006.

24. A $25,000 purchase decreases 12% in value per year. Determine the value of the purchase after 3 years and after 7 years.

25. A car cost $25,000 new and the rate of depreciation is 8%. How long will it take for the car to lose half its value?

26. You deposit $200 into an account earning 5%, compounded monthly. How much will be in the account after 7 years?