**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_ Unit 10: Sequences Practice Quest**

1. What is the common difference, *d*, for the following sequence?

6, 11, 16, 21, …

1. Is the following sequence arithmetic or geometric, and what is the common difference (*d*) or the common ratio (*r*) of the sequence?



1. Arithmetic, *d* = 3
2. Geometric, *r* = 3
3. Geometric, *r* = −
4. Arithmetic, *r* = −
5. What is the common difference, *d*, in the arithmetic sequence defined by the formula *an* = −3*n* − 2?
6. What is the common ratio, *r*, for the geometric sequence represented by the formula ?
7.  3. 
8. 3 4. 
9. Find the 22nd term of the arithmetic sequence with *a*1 = –6 and a common difference of *d* = 3.
10. 54 3. 60
11. −63 4. 57
12. Find the 19th term of the following sequence: −20, −17, −14, …
13. In a geometric sequence, *a*1 = 2.5 and *r* = 1.5. Find *a*20 to the nearest hundredth.
14. Find the 10th term of the sequence:  3, 6, 12, …
15. 512
16. 768
17. 1024
18. 1536
19. A tree is 4 feet tall at week 0 and grows 2 feet each year. Which function(s) shown below can be used to determine the height, f(n), of the tree in n years?
	1. f(n) = 2n + 4
	2. f(n) = f(n - 1) + 2 where f(0) = 4
	3. f(n) = 2n + 4(n - 1)
20. i and iii 3. i and ii
21. ii only 4. i only
22. A. Find the first four terms of the recursive sequence defined by:

*a*1 = 0.5

*an* = 2(*an*–1) + *n*

b. Is this a arithmetic, geometric sequence or neither

c. Find $a\_{7}$

1. Caitlin has a movie rental card. After she rents the first movie, the card’s value is $172.25. After she rents the second movie, its value is $169.50. After she rents the third movie, the card is worth $166.75.
2. Assuming the pattern continues, write a sequence to define A(n), the amount of money on the rental card after n rentals.
3. Caitlin rents a movie every Friday night. How much money will be in Caitlyn’s card after renting 10 movies?
4. The height of water in the city’s reservoir decreases over the years. During the first year the height of the water was 3150 m. Each year after that, the height of the water is three-fourth of the height of the previous year.
	* 1. Find a pattern and list the first 4 terms.
		2. Write the explicit nth term rule determines the height of the water over n number of years.
		3. What is the height of the water during the 7th year? Rounded to the nearest hundredth.
5. The third term in an arithmetic sequence is 10 and the fifth term is 26. If the first term is a1, which is an equation for the nth term of this sequence?
6. If $a\_{1}=1, a\_{2}=3, and a\_{n}=2a\_{n-1}-3a\_{n-2} $
	1. Find the first 5 terms
	2. Identify if this sequence is arithmetic, geometric or neither. Explain your reason.

16. Maxwell is attempting to determine the volume of a penny in cubic centimeters. He does an experiment where he drops pennies into water and records the volume, in milliliters. The data is shown below.

a. Explain why the volume is a discrete function.

* 1. Graph the data from the chart on the grid below.

c. Write a general rule for a sequence V(n) that can represent the volume of the water after dropping (n) pennies, assuming that the first term is the volume of the water after dropping the first penny.



****Blast from the recent past: Review questions:

 **Solving exponential functions graphically**

1. Ryan had purchased a motorcycle for $ 4168. The value of the motorcycle has depreciated by 12% every year and it is now worth $ 2500. Graphically figure out how many years ago did Ryan purchase the motorcycle.



1. The value of Jim’s investment is increasing by 4% each year. If his initial investment is $1200, determine the following. Write an equation which could be used to determine the total value of his investment after x years. Remember: In the exponential equation , a is the starting value and b is the growth/decay ratio.
2. Use your equation to determine the total value of his investment after 50 years algebraically.
3. Graphically determine when his investment will double up. (Notes, Graphically means to provide a sketch with an appropriate window and to find the intersection).