10.1 CA Name: _____

Part 1

1.

Arithmetic Sequence - is a sequence of terms that have a common _____ between them.	**Geometric Sequence** - is a sequence of terms that have a common _____ between them.

2. What are the next three terms in the sequence $13,8,3,-2,\_\_\_,\_\_\_,\_\_\_\_$?
   Geometric or Arithmetic?
   Linear or Exponential?
   Identify the common difference or ratio: _____

3. What are the next three terms in the sequence $3,12,48,192,\_\_\_,\_\_\_,\_\_\_\_$?
   Geometric or Arithmetic?
   Linear or Exponential?
   Identify the common difference or ratio: _____

Part 2

1. Are the following sequences arithmetic, geometric, or neither? If they are arithmetic, state the value of d. If they are geometric, state r.

   a) 6, 12, 18, 24, ... _____

   b) 6, 11, 17, ... _____

   c) 2, 14, 98, 686, ... _____

   d) 160, 80, 40, 20, ... _____

   e) -40, -25, -10, 5, ... _____

   f) 7, -21, 63, -189, ... _____

2. For the following arithmetic sequences, find a and d and state the formula for the general term. Don't forget to simplify!

a) - 10, - 4, 2, 8, 14, ... b) 10, 8, 6, 4, ... c) 36, 31, 25, 21, ...

3. Use your formula from question 2c to find the values of t_7 and t_{20}.

4. For the following geometric sequences, find a and r and state the formula for the general term.

a) 1, 3, 9, 27, ... b) 12, 6, 3, 1.5, ... c) 9, -3, 1, ...

5. Use your formula from question 4c) to find the values of the t_4 and t_{12}

Part 2 Answers

Answers:

1a) arithmetic d = 6 b) neither c) geometric r = 7 d) geometric r = 0.5 or r = ½ e) arithmetic d = 15 f) geometric r = -3 2a) a = -10; d=6; t_n=6n-16 b) a = 10; d=-2; t_n=-2n+12 c) a = 36; d=-5; t_n= - 5n+41 3. t_7=6; t_{20} = -59 4. a) a = 1; r = 3; $t_n = 1(3)^{n-1}$ b) a = 12; r = $\frac{1}{2}$; $t_n = 12\left(\frac{1}{2}\right)^{n-1}$ c) a = 9; r = - 3; $t_n = 9(-3)^{n-1}$ 5. t_4 = -243 t_{12} = -177147

Part 3

State whether the sequence is arithmetic or geoemtric. Then find the next three terms in each sequence.

1) 2, 8, 32, 128, 512, ...

2) 3, 12, 48, 192, 768, ...

3) −35, −32, −29, −26, −23, ...

4) −24, −14, −4, 6, 16, ...

5) 3, −9, 27, −81, 243, ...

6) −1, −4, −16, −64, −256, ...

7) 1, 2, 4, 8, 16, ...

8) −12, −3, 6, 15, 24, ...

9) −8, −6, −4, −2, 0, ...

10) 3, 11, 19, 27, 35, ...

11) Check your answers with Mrs. Urquhart. Then, determine a formula to represent any of the arithmetic or geometric sequences above. If it neither you don't have to do anything with it.

Part 4

State if the tables below are linear or exponential. Then write an equation for each.

1.

x	−3	−2	−1	0	1	2	3
y	−16	−13	−10	−7	−4	−1	2

2.

x	−3	−2	−1	0	1	2	3
y	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

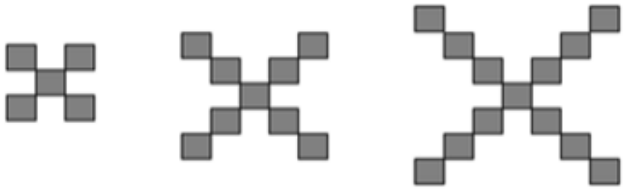
3.

x	-3	-2	-1	0	1	2	3
Y	11	9	7	5	3	1	-1

4.

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

5. Use the pattern below to answer the following questions.



a) Arithmetic (linear) or Geometric (Exponential)?

b) How many squares are being added for each step?

c) How many squares will be in the next term?

d) Write a formula to represent this sequence.

e) Sketch a graph of what is happening.

6. In the fiction novel, *Dante's Inferno* by Dan Brown, there is an extremist who is concerned about the world's population growth. This villain bombards the head of the world health organization (the woman heard in the audio clip) by unexpectedly showing up in her office and continuously mocks her line of work.

The world health organization is concerned with population growth, disease control, and general international public health.

During this impromptu meeting, he condescendingly explains to her why her life's work is pointless and counterproductive. In the audio clip you will see him trying to explain why we need to stop working on cures for diseases by comparing the world population growth to continuously ripping a stack of papers in half.

(Go to my website to hear audio recording of this mentioned in the book)

a) Fill in the table below

Number of times we repeat the process		Height of the stack
0		
1		
2		
3		
4		
5		
10		
n		

b) Arithmetic (linear) or Geometric (Exponential)?

c) Draw a general sketch of what is happening.

d) What will the stack be on the 50^{th} time we repeat this process?

e) Why is this mad man using this as an example of population growth? Why does he think it's a bad idea to cure world diseases?