ALGEBRA 1 Name: _____
Ch 5 Closure – Sequences

VOCABULARY:

arithmetic sequence	domain	multiplier	term number
common difference	explicit equation	recursive equation	*t(0)*
common ratio	exponential functions	sequence	*t(1)*
continuous	geometric sequence	term	*y*-intercept
discrete	linear functions		

_____ **1.** An organized list of numbers.

_____ **2.** A sequence that is generated by adding or subtracting a constant amount to the previous term to get the next term.

_____ **3.** A sequence that is generated by multiplying or dividing a constant amount to the previous term to get the next term.

_____ **4.** This is the sequence generator in an arithmetic sequence.

_____ **5.** This is the sequence generator in a geometric sequence.

_____ **6.** This is another name for the sequence generator in a geometric sequence.

_____ **7.** This represents where a number is located within a sequence; *n*.

_____ **8.** A number within a sequence; *t(n).*

_____ **9.** The mathematical way of indicating the first number in a sequence.

_____ **10.** The mathematical way of indicating the term before the first term.

_____ **11.** A type of equation for a sequence that allows you to calculate any number in the sequence using *n*.

_____ **12.** A type of equation for a sequence that has two parts. To use it, you need to know the "previous" term to calculate the "next" term.

_____ **13.** The graph of an arithmetic sequence belongs to this family.

_____ **14.** The graph of a geometric sequence belongs to this family.

_____ **15.** When the points on a graph are not connected (like for a sequence), the graph is called this.

_____ **16.** When the points on a graph are connected, the graph is called this.

_____ **17.** This is where a graph crosses the *y*-axis. In a sequence, this value helps us generate the explicit formula, but it does not exist on the graph.

_____ **18.** The set of all input values in a function. In a sequence, it's all Natural numbers.

CONCEPTS:

1. Each of the explicit functions listed defines a sequence. List the first four terms of each sequence and state whether each sequence is arithmetic, geometric or neither.

a. $t(n)=5n+2$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

b. $a_n=3-8n$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

c. $t(n)=n(9-n)$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

d. $t(n)=(-2)^n$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

e. $a_n=\frac{3}{4}n+1$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

f. $a_n=100\left(\frac{1}{4}\right)^n$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

2. Each of the recursive functions listed defines a sequence. List the first four terms of each sequence and state whether each sequence is arithmetic, geometric or neither.

a. $t(1)=5$
$t(n+1)=t(n)+3$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

b. $t(1)=100$
$t(n+1)=t(n)*1.5$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

c. $t(1)=-3$
$t(n+1)=t(n)\cdot(-2)$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

d. $t(1)=12$
$t(n+1)=t(n)-7$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

e. $t(1)=\frac{1}{2}$
$t(n+1)=t(n)+\frac{1}{4}$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

f. $t(1)=1$
$t(n+1)=(t(n))^2+2$

_____ , _____ , _____ , _____

Circle one: arithmetic geometric neither

3. For each of the following sequences, write an explicit equation, a recursive equation, then calculate the 25th term in the sequence. Show all work.

a. 14 , 10 , 6 , 2 , …

explicit:

recursive:

25th term:

b. -16 , -13 , -10 , -7 , …

explicit:

recursive:

25th term:

c. 32 , 64 , 128 , 256 , …

explicit:

recursive:

25th term:

d. 5 , -5 , 5 , -5 , …

explicit:

recursive:

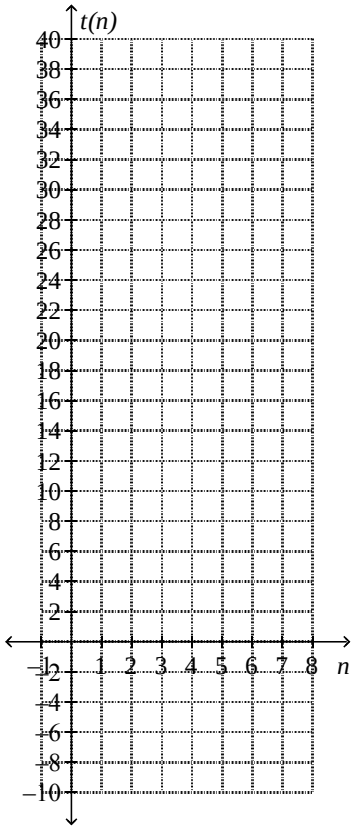
25th term:

4. Create a graph for the following sequences. State whether the sequence is arithmetic or geometric.

a. $t(n) = -3n + 15$

Circle one: arithmetic geometric neither

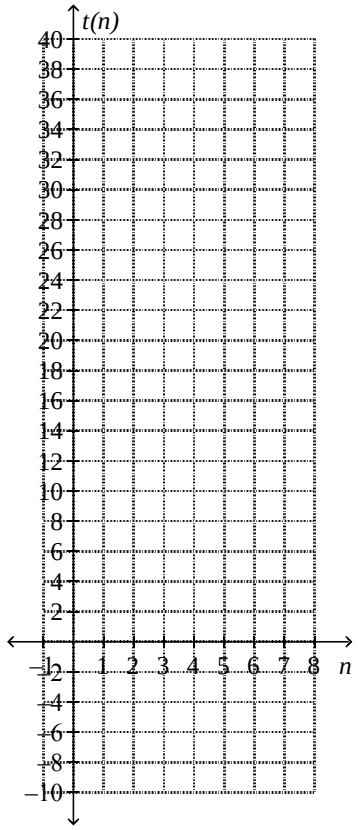
n	t(n)



b. $t(1) = 3.5$
$t(n+1) = t(n) + 1.5$

Circle one: arithmetic geometric neither

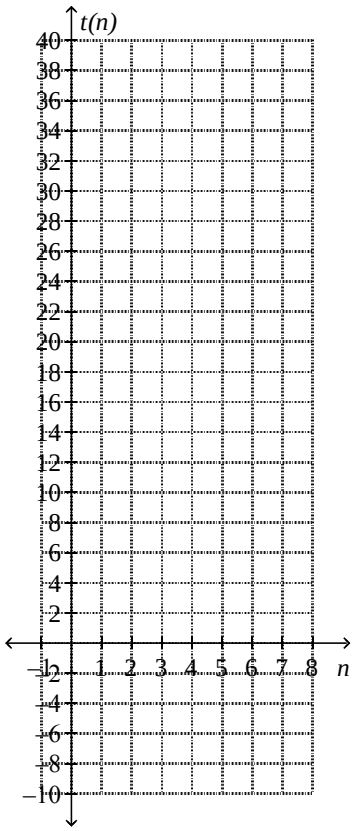
n	t(n)



c. $t(n) = 50(0.8)^n$

Circle one: arithmetic geometric neither

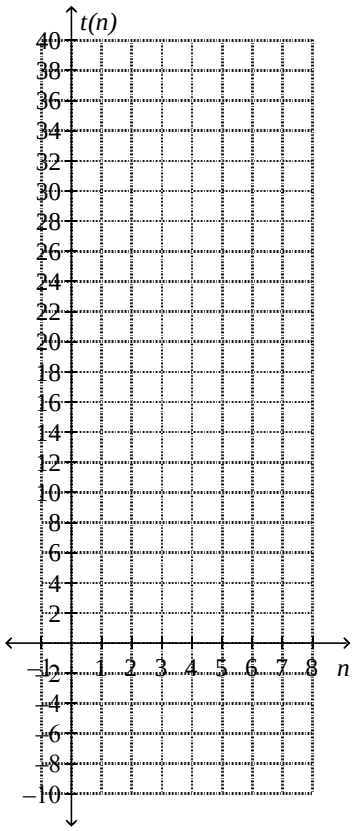
n	t(n)



d. $t(1) = 3$
$t(n+1) = t(n) \cdot 1.2$

Circle one: arithmetic geometric neither

n	t(n)



5. Find the missing terms for this sequence: _____ , 15 , 11 , _____ , 3 , …

Is this sequence arithmetic, geometric, or neither? _____

Is the number – 405 in this sequence? _____ If so, what term is it? _____

If not, explain why not.

6. Find the missing terms for this sequence: _____ , 20 , 40 , _____ , 160 , …

Is this sequence arithmetic, geometric, or neither? _____

Is the number 405 in this sequence? _____ If so, what term is it? _____

If not, explain why not.

7. Find the missing terms for this sequence: _____ , 14 , 18 , 21 , 23 , _____ , …

Is this sequence arithmetic, geometric, or neither? _____

What is the 10^{th} term in this sequence? _____

8. Shannon is buying songs for her ipod. She got a gift card for her birthday and was able to buy 20 songs right away. Each Saturday she uses some of her allowance money to buy 4 more songs.

a. Create a table of values that will show the number of songs Shannon will have on her ipod over time.

n represents _____						
t(n) represents _____						

b. Write an explicit equation for the situation:

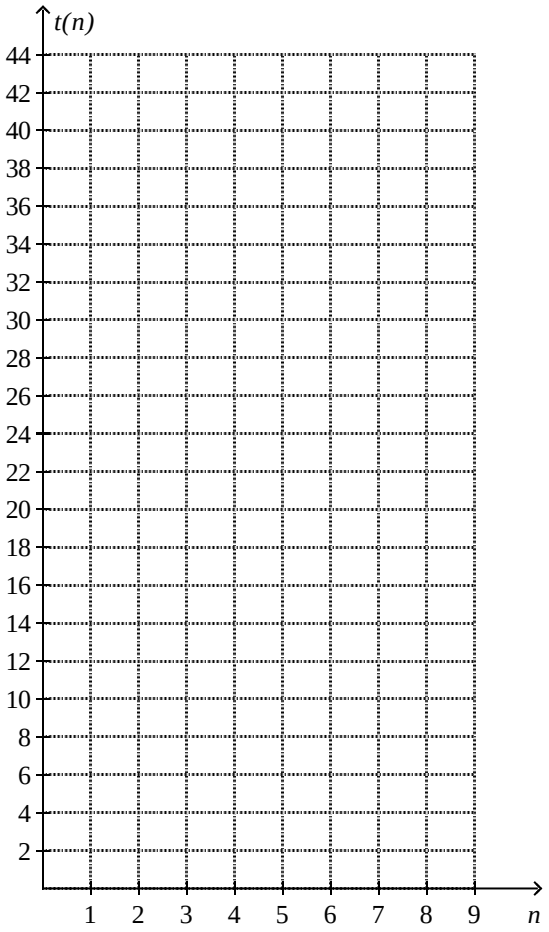
_____

Write a recursive equation for the situation:

_____

_____

c. Create a graph for the situation:



d. At this rate, will Shannon ever have

exactly 354 songs on her ipod? _____
Explain how you know.

e. If the **table** was for a function instead of a sequence, how would it be different?

_____

f. If the **graph** was for a function instead of a sequence, how would it be different?

_____

9. Rosa tripped and fell into a muddy puddle before school (she was so embarrassed!). Students at Rosa's school were only allowed to use their phones between classes and Rosa knew exactly what would happen: after one class, the two girls who saw her fall would **each** send a picture of her to one person; after two classes, those four students would **each** send the picture to one more person. Rosa knew this would continue until the end of the day.

a. Create a table of values that will show how many people received the picture after each class.

n represents _____						
t(n) represents _____						

b. Write an explicit equation for the situation:

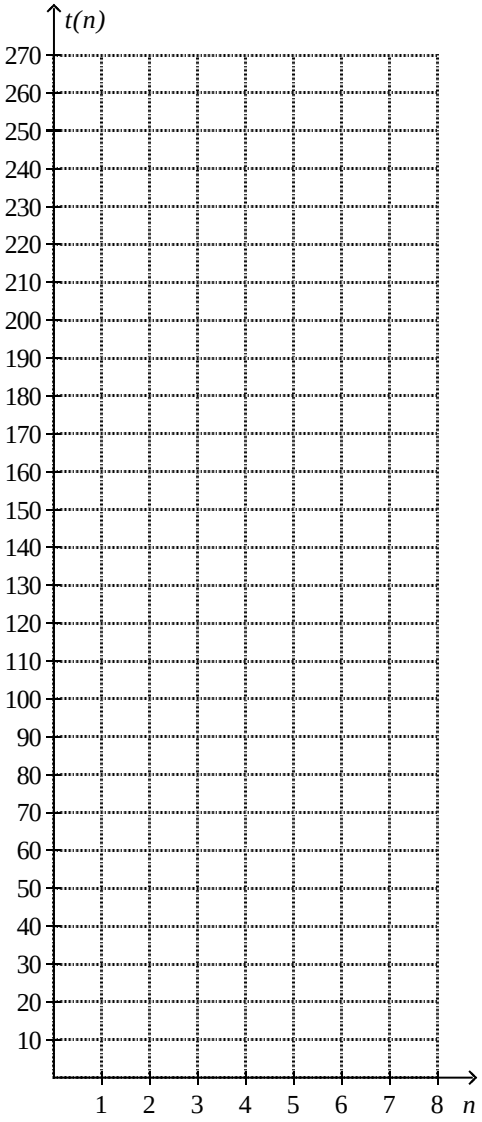
_____

Write a recursive equation for the situation:

_____

_____

c. Create a graph for the situation: (Watch the scale!)



d. At this rate, how many classes would there be in a day if all 2016 students received a copy of the picture by the end of the day?

Show your work.