Name: _____
CC Algebra

Sequences Quiz Review

1) What are the first four terms in the sequence whose general term is $f(n) = 3(-2)^{n-1}$?

A) 0, -6, 12, -24
B) 1, -6, 12, -24
C) 3, -6, 12, -24
D) 3, 6, 12, 24

2) What are the first three terms in the sequence whose general term is $f(n) = \frac{2n}{n+1}$?

A) $1, \frac{4}{3}, \frac{3}{2}$
B) $0, 1, \frac{4}{3}$
C) $1, \frac{1}{2}, \frac{1}{3}$
D) $\frac{4}{3}, \frac{5}{4}, \frac{6}{5}$

3) The sequence 1, -3, 9, -27 is *best* described as

A) both arithmetic and geometric
B) geometric
C) arithmetic
D) neither arithmetic nor geometric

4) The common ratio for the geometric sequence $6, -2, \frac{2}{3}, \ldots$ is

A) $-\frac{1}{3}$
B) $\frac{1}{3}$
C) 1
D) -3

5) Find a formula for $f(n)$ of the following geometric sequence: 10, 50, 250, 1,250, ...

A) $f(n) = 10 \times 2^{n-1}$
B) $f(n) = 2 \times 5^{n-1}$
C) $f(n) = 10 \times 5^{n-1}$
D) $f(n) = 5 \times 2^{n-1}$

6) What is the next term in the arithmetic sequence -10, -17, -24, -31, ...?

A) 15
B) -45
C) -20
D) -38

7) Find an explicit form, $f(n)$, for the following arithmetic sequence: 2, 5, 8, 11, ...

A) $f(n) = 3(n - 1)$
B) $f(n) = 3n - 1$
C) $f(n) = 2n$
D) $f(n) = -9\left(\frac{1}{3}\right)^{n-1}$

8) What is the third term of the sequence defined by $f(1) = \frac{1}{2}$ and $f(n) = 2f(n - 1) + 1$ when $n > 1$?

A) 4
B) 7
C) 5
D) 11

9) Suppose you put $1.50 in a jar at the end of one week. One week later you put in $2.00. At the end of the third week you deposit $2.50, and continue to add 50¢ to the previous week's deposit thereafter. What is your weekly deposit at the end of the 27th week?

A) $15.00
B) $14.50
C) $15.50
D) $231.00

10) A sequence has the following terms: f(1) = 4, f(2)= 10, f(3) = 25, f(4) = 62.5. Which formula represents the n^{th} term in this sequence?

A) $f(n) = 4 + 2.5n$
B) $f(n) = 4(2.5)^{n-1}$
C) $f(n) = 4 + 2.5(n - 1)$
D) $f(n) = 4(2.5)^n$

11) Find the sixth term of the geometric sequence when f(4) = -8 and $r = 0.5$.

A) -2
B) 2
C) -4
D) 4

12) For the given arithmetic sequence, write an explicit formula for f(n). Assume the initial value of n to be 1.

10, 9.75, 9.5, 9.25, ...

Show your work.

Answer: _____

13) For the sequence -5, 4, 13, 22, ... assume the pattern does not change.

Part A

Determine if the sequence is arithmetic, geometric, or neither.

Answer: _____

Part B

If geometric, state the common ratio. If arithmetic, state the common difference.

Answer: _____

Part C

Write a formula to represent the n^{th} term when $n \geq 1$ for the sequence.

Answer: _____

14) Find the first 6 terms of the sequence with f(1) = 2 and f(n) = 3f($n - 1$) + 3 for $n \geq 2$.

Show your work.

Answer: _____

15) ***Part A***

Write the first five terms of the sequence for which f(n) = $2(3^{n-1})$.

Show your work.

Answer: _____

Part B

Is this sequence arithmetic, geometric, or neither?

Answer: _____

16) Given the following geometric sequence: 6, 9, 13.5, 20.25, ...

Part A

What is the common ratio for this sequence?

Answer: _____

Part B

Write an explicit formula, f(*n*), for the sequence.

Show your work.

Answer: _____

Part C

Find the 10th term to the nearest hundredth.

Show your work.

Answer: _____

17) For the sequence -9, -3, -1, $-\frac{1}{3}$, ... assume the pattern does not change.

Part A

Determine if the sequence is arithmetic, geometric, or neither.

Answer: _____

Part B

If geometric, state the common ratio. If arithmetic, state the common difference.

Answer: _____

Part C

Write a formula to represent the n^{th} term when $n \geq 1$ for the sequence.

Answer: _____

18) A ball is dropped from a height of 27 feet. On each rebound the ball rises to a height of two-thirds that from which it fell.

Part A

Write a formula to determine how high the ball rises on n rebounds when $n \geq 0$.

Answer: _____

Part B

How far will the ball rise on the fourth rebound?

Show your work.

Answer: _____ feet

19) During a flu outbreak, a hospital recorded 8 cases the first week, 20 cases the second week, and 50 cases the third week.

Part A

Write an explicit formula for a geometric sequence to model the flu outbreak when $n \geq 1$.

Answer: _____

Part B

Use the formula written for Part A to determine the total number of infected people after 5 weeks, rounded to the nearest person.

Show your work.

Answer: _____ people

20) Gil is planning on adding a deck on the corner of his home. He is using the plan below to study the relationship between increasing the size of the deck and its resulting perimeter.

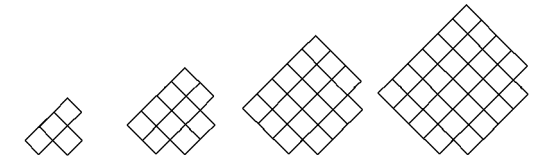

Figure 1 Figure 2 Figure 3 Figure 4

Deck Plan

Figure	1	2	3	4
Perimeter	10	14	18	22

Part A

Write an explicit formula to represents the perimeter, P(n), of the n^{th} figure in the sequence?

Show your work.

Answer: _____

Part B

Use the formula written for Part A to determine the number of boxes needed to form the 10th figure in the sequence?

Show your work.

Answer: _____ boxes

1) C 2) A 3) B 4) A 5) C

6) D 7) B 8) C 9) A 10) B

11) A

12) f(n) = -0.25n + 10.25
WORK SHOWN: a = 10, d = 9.75 − 10 = -0.25, f(n) = a + (n − 1)d, f(n) = 10 + (n − 1)(-0.25) = 10 − 0.25n + 0.25 = -0.25n + 10.25

13) Part A: arithmetic; Part B: d = 9; Part C: f(n)= 9n − 14

14) 2, 9, 30, 93, 282, 849
WORK SHOWN: f(1) = **2** and f(n) = 3f(n − 1) + 3; f(2) = 3f(2 − 1) + 3 = 6 + 3 = **9**, f(3) = 3f(3 − 1) + 3 = 27 + 3 = **30**,
f(4) = 3f(4 − 1) + 3 = 90 + 3 = **93**, f(5) = 3f(5 − 1) + 3 = 279 + 3 = **282**, f(6) = 3f(6 − 1) + 3 = 846 + 3 = **849**

15) Part A: 2, 6, 18, 54, 162; Part B: geometric

16) Part A: $r = \frac{3}{2}$;
Part B: f(n) = $6(\frac{3}{2})^{n-1}$
WORK SHOWN: $r = \frac{f(2)}{f(1)}$, $r = \frac{9}{6} = \frac{3}{2}$, f($n$) = $6(\frac{3}{2})^{n-1}$;
Part C: f(10) = 230.66
WORK SHOWN: f(10) = $6(\frac{3}{2})^{10-1}$, f(10) = $6(\frac{3}{2})^{9} = 6(\frac{19,683}{512}) \approx 230.66$

17) Part A: geometric; Part B: $r = \frac{1}{3}$;
Part C: $f(n) = -9\left(\frac{1}{3}\right)^{n-1}$

18) Part A: h(n) = $27(\frac{2}{3})^{n}$;
Part B: $\frac{16}{3}$ feet OR 5.3 feet
WORK SHOWN: h(4) = $27(\frac{2}{3})^{4} = 27(\frac{16}{81}) = \frac{16}{3}$

19) Part A: f(n) = $8(2.5)^{n-1}$;
Part B: 313 people
WORK SHOWN: f(5) = $8(2.5)^{5-1}$, f(5) = $8(2.5)^{4}$ = 313

20) Part A: P(n) = 4n + 6
WORK SHOWN: P(1) = a = 10, P(2) = a + d, 14 = 10 + d,
d = 4; P(n) = a + (n − 1)d, P(n) = 10 + (n − 1)4, P(n) = 4n + 6;
Part B: 46
WORK SHOWN: P(10) = 4(10) + 6 = 46