Bell Ringer

Wednesday 12/4

Determine whether each recursive rule represents an arithmetic or geometric sequence.

$a_1 = 18, a_n = a_{n-1} + 1$

Arith

18, 19, 20, ...

$a_1 = 3, a_n = -6a_{n-1}$

Geo

3, -18, 108, ...

Write a recursive rule for each sequence

n	1	2	3	4
a_n	8	24	72	216

×3

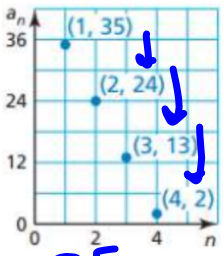
$a_1 = 8$,
$a_n = 3a_{n-1}$

$r = 3$

3, 11, 19, 27, 35, ... +8

$d = 8$

$a_1 = 3$
$a_n = a_{n-1} + 8$



Arith

$a_1 = 35$
$a_n = a_{n-1} - 11$

6.5 online hw due today

6.6 online hw due tomorrow

Ch 6 Test Friday

Pass back Ch 6 Quiz

Chapter 6 Quiz (Sections 6.1-6.3)

Name_____ Date_____ Hour _____ Score:

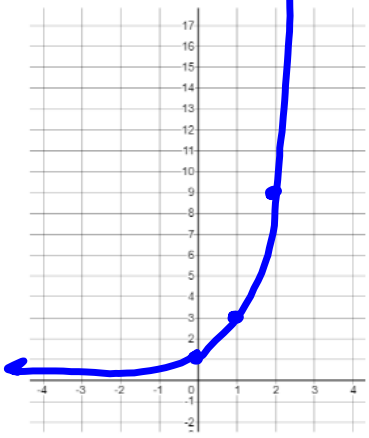
1. Compare the graph of $f(x) = 2^{x+1} - 3$ to the graph of the parent function $g(x) = 2^x$. Describe the domain and range of f.

2-7. Identify the initial amount *a* and the rate of growth *r* (as a percent) of the exponential function. Evaluate the function when $t = 5$. Round to the nearest tenth.

2. $y = 50(1 + 0.63)^t$ **3.** $y = 3.75(2)^t$ **4.** $y = 1(1 + 0.04)^t$

5. $f(t) = 4(1.65)^t$ **6.** $g(t) = \frac{1}{4}(1.2)^t$ **7.** $h(t) = 70\left(1 - \frac{4}{5}\right)^t$

8. Graph $y = 3^x$. Describe the domain and range.



Determine whether the table represents an *exponential growth function*, an *exponential decay function*, or *neither*. Explain.

9.

x	0	1	2	3
y	4	8	12	16

10.

x	1	2	3	4
y	28,561	2197	169	13

Answers

1. _____
2. a = _____ r = _____ t = 5: _____
3. a = _____ r = _____ t = 5: _____
4. a = _____ r = _____ t = 5: _____
5. a = _____ r = _____ t = 5: _____
6. a = _____ r = _____ t = 5: _____
7. a = _____ r = _____ t = 5: _____
8. GRAPH Domain: _____ Range: _____
9. _____
10. _____

11. The function $f(t) = 16(1.4)^t$ represents the number of deer in a forest after t years.

a. Does the function represent exponential growth or exponential decay?

b. Graph the function on a calculator. Describe the domain and range.

c. What is the yearly percent change?

d. How many deer are in the forest after 6 years?

Answers

11.a. growth

b. Domain: $(-\infty, \infty)$ $[0, \infty)$

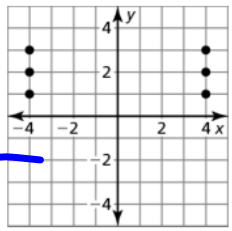
Range: $(0, \infty)$ $[16, \infty)$

c. 40%

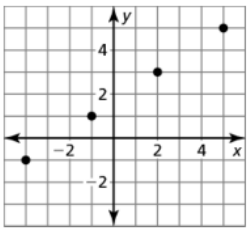
d. _____

Determine whether the points appear to represent a *linear function*, an *exponential function*, or *neither*.

12.



13.



12. _____

13. _____

How long until the zombies take over?

On the TV show The Walking Dead, a disease was contracted that turns people into zombies (or Walkers). If the Walkers bite a human, the human is turned in to a Walker. Assume that the each Walker turns one person a week into a zombie and that none of the Walkers are killed.

1. The diagram below represents a town with 150 people. Each box represents a human; each filled in box represents a Walker. Keep track of the Walker and human populations over time.

Weeks	1	2	3	4	5	6	7	8	9	10	11
■ Walkers	1	2	4	8	16	32	64	128	150	150	150
□ Humans	149	148	146	142	134	118	86	22	0	0	0

a. How does the Walker population change each week, and how long will it take before everyone in town is a Walker?

8- 9 weeks

b. List the number of Walkers as a sequence for the first 5 weeks.

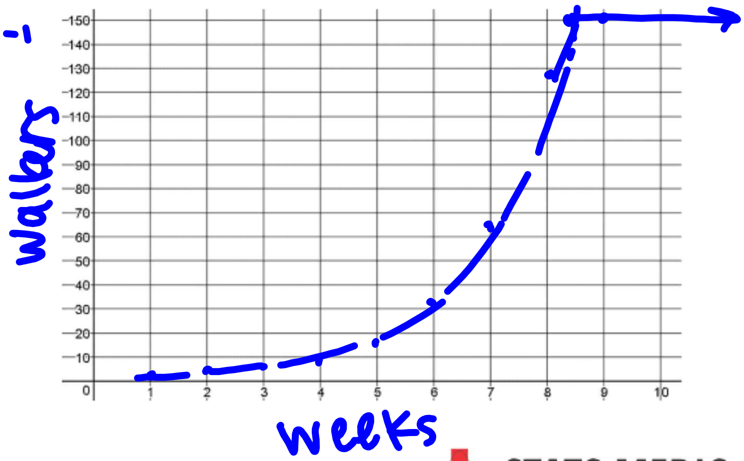
1, 2, 4, 8, 16, ...

c. Write a **recursive and explicit** formula for the sequence.

R: $a_1 = 1, \quad a_n = 2a_{n-1}$

E: $a_n = 1 \cdot 2^{n-1}$

d. Graph the sequence.



e. What *x* values are used?

1-9

f. What *y* values are used?

1-150

STATS MEDIC

2. A different town of 150 people started with 3 Walkers. Complete the table below.

Weeks	1	2	3	4	5	6	7	8	9	10	11
■ Walkers	3	6	12	24	48	96	150				
□ Humans	147	144	138	126	102	54	0				

a. How long will it take for everyone in that town to become a Walker?

6-7 weeks

b. List the number of Walkers as a sequence for the first 5 weeks.

3, 6, 12, 24, 48, ...

c. Write a **recursive and explicit** formula for the sequence.

R: $a_1 = 3, \quad a_n = 2a_{n-1}$

E: $a_n = 3 \cdot 2^{n-1}$

3. Imagine there is an infinite number of people who can be infected by the Walkers.

a. Create a sequence showing how many people are infected if there are 4 Walkers to start at week 0. Show weeks 0 to 5.

wks	0	1	2	3	4	5
walkers	4	8	16	32	64	128

b. ~~Write a recursive formula for the sequence.~~

$a_1 = 8, \quad a_n = 2a_{n-1}$

$a_0 = 4$

$a_n = 8 \cdot 2^{n-1}$

c. How many Walkers will there be in…

Week 8?

$8 \cdot 2^{8-1}$

$8 \cdot 2^7$

1,024

Week 13?

$8 \cdot 2^{12}$

32,768

Week 24?

$8 \cdot 2^{23}$

33,554,432

67,109,864

due Friday

Name _____ Date _____ Hour _____ Score

do ODDS on front
do both on back

Geometric Sequences – Recursive and Explicit Formulas

Fill in the blanks so the values fit the geometric sequence. Write the explicit and the recursive formula.

1)

1	2
2	4
3	8
4	16
5	

2)

1	1
2	3
3	9
4	27
5	

3)

1	-5
2	-25
3	-125
4	-625
5	

4)

1	2
2	6
3	18
4	54
5	

5)

1	16
2	8
3	4
4	2
5	

6)

1	-36
2	-6
3	-1
4	-1/6
5	

7)

1	-2
2	-4
3	-8
4	-16
5	

8)

1	48
2	24
3	12
4	6
5	

9)

1	
2	5
3	15
4	45
5	

10)

1	
2	4
3	16
4	64
5	

11)

1	
2	6,561
3	2,187
4	729
5	

12)

1	
2	-8
3	-32
4	-128
5	

13) Tearing: Begin with 1 piece of paper at stage 1. For stage 2, tear it in half. For each succeeding stage tear each piece of paper in half. Keep track of the total pieces of paper.

Recursive

Sequence Rule: 10^{th} number

_____ _____

Stage (n)	total pieces (a_n)
1	1
2	2

Describe the pattern_____ equation: a_n =_____

Describe what the graph would look like _____

14) Gossip: One student tells three other students a secret. Those three students plus the original student each tell three more students. At each stage, all those who know the secret tell three more people. Keep track of the total people who know the secret.

Recursive

Sequence Rule: 10^{th} number

_____ _____

1 4 ____ ____ ____

stage (n)	total (a_n)
1	1
2	4

Describe the pattern_____