Name: _____ Date: _____

Sequences Practice

(Fill in the formulas)	Explicit	Recursive
Arithmetic	$a_n = a_1 + d(n-1)$	$a_n = a_{n-1} + d$ when $a_1 = ?$
Geometric	$a_n = a_1 \cdot r^{n-1}$	$a_n = r(a_{n-1})$ when $a_1 = ?$

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

1. 1, 3, 9, 27, … (×3 ×3 ×3) geometric
2. 2, 5, 8, 10, … (+3 +3 +2) neither
3. 2, 4, 6, 8 …
4. 4, 7, 10, 13, …

Write the rule for each arithmetic sequence and find the given term:

Sequence	Common Difference (d)	Explicit Formula	Recursive Formula	Given Term (n^{th})
a_1 (5) 7, 9, 11, 13, … (+2 +2)	$d = 2$	$a_n = 5 + 2(n-1)$ $a_n = 5 + 2n - 2$ $\boxed{a_n = 2n + 3}$	$a_n = a_{n-1} + 2$ when $a_1 = 5$	$a_{10} = 2(10) + 3$ $\boxed{a_{10} = 23}$
-4, -5, -6, -7, -8, …				$a_{12} =$
a_1 (103) 99, 95, … (-4 -4)	$d = -4$	$a_n = 103 - 4(n-1)$ $a_n = 103 - 4n + 4$ $\boxed{a_n = -4n + 107}$	$a_n = a_{n-1} - 4$ when $a_1 = 103$	$a_{38} = -4(38) + 107$ $\boxed{a_{38} = -47}$

Find the nth term for each arithmetic sequence:

8. $a_1 = 3$, $d = -4$, $n = 6$

$a_n = 3 - 4(n-1)$
$a_n = 3 - 4n + 4$
$\boxed{a_n = -4n + 7}$

$a_6 = -4(6) + 7$
$\boxed{a_6 = -17}$

9. $a_1 = -5$, $d = 1/2$, $n = 10$

Complete each statement:

10. 27 is the 9 th term of: -5, -1, 3, 7, …

$a_n = -5 + 4(n-1)$
$a_n = -5 + 4n - 4$
$\boxed{a_n = 4n - 9}$

$27 = 4n - 9$
$+9 \quad +9$
$\frac{36}{4} = \frac{4n}{4}$
$\boxed{n = 9}$

11. -10 is the _____ th term of: 14, 12.5, 11, 9.5, …

Write the rule for each geometric sequence and find the given term:

Sequence	Common Ratio (r)	Explicit Formula	Recursive Formula	Given Term (n^{th})
-4, -12, -36, -108 ... (×3)	$r=3$	$a_n=-4(3)^{n-1}$	$a_n=3(a_{n-1})$ when $a_1=-4$	$a_{10}=-4(3)^{10-1}=-78132$
160, 80, 40, 20, ... (÷2)	$r=\frac{1}{2}$	$a_n=160\left(\frac{1}{2}\right)^{n-1}$	$a_n=\frac{1}{2}(a_{n-1})$ when $a_1=160$	$a_{12}=160\left(\frac{1}{2}\right)^{12-1}=0.078125$
2, 8, 32, 128, ...				$a_{14}=$

Find the nth term for each geometric sequence. Round to 3 decimal places if necessary.

15. $a_1 = 3, r = -4, n = 6$

$a_n=3(-4)^{n-1}$ $\quad a_6=-3072$

16. $a_1 = -500, r = 1/2, n = 10$

17. What are the first four terms in the sequence whose nth term is $a_n=(-2)^n+1$

a. 3, 4, 5, 6
b. -1, 1, -1, 1
c. -1, 5, -7, 17
d. -2, 4, -8, 16

18. The 8th term of an arithmetic sequence is 36. If the common difference is 2, what is the first term in the sequence? (Hint: work backwards!!!)

a. 22
b. 24
c. 38
d. 64

$a_n=a_1+d(n-1)$
$36=a_1+2(8-1)$
$36=a_1+14$
$a_1=22$

19. Look at the sequence in this table. What function represents this sequence?

a. arithmetic; $a_n=a_{n-1}+1$
b. arithmetic; $a_n=a_{n-1}+2$
c. geometric; $a_n=2(a_{n-1})$
d. geometric; $a_n=3(a_{n-1})$

a	1	2	3	4	...
a_n	-1	1	3	5	...

(+2, +2, +2)

20. Look at the sequence in this table. What function represents this sequence?

a. $a_n=n+7$
b. $a_n=n+9$
c. $a_n=2n+5$
d. $a_n=3n+5$

$a_n=8+3(n-1)$
$=8+3n-3$
$a_n=3n+5$

a	1	2	3	4	...
a_n	8	11	14	17	...

(+3, +3)