

6. Write a recursive rule and a closed rule for the sequence. *Remember to write the 1st term in the sequence for recursive rule.

Recursive Rule*

$$a_1 = 1$$

$$a_n = a_{n-1} - 4$$

a) 1, -3, -7, -11, ...

$$a_1 = 10$$

$$a_n = a_{n-1} - 2$$

b) 10, 8, 6, 4, ...

$$a_1 = -7$$

$$a_n = a_{n-1} + 5$$

c) -7, -2, 3, 8, ...

$$a_1 = -9$$

$$a_n = a_{n-1} + 4$$

d) -9, -5, -1, 3, ...

$$a_1 = 12$$

$$a_n = a_{n-1} - 7$$

e) 12, 5, -2, -9, ...

Explicit Rule

$$a_n = 1 - 4(n-1)$$

$$a_n = -4n + 3$$

$$a_n = 10 - 2(n-1)$$

$$a_n = -2n + 12$$

$$a_n = -7 + 5(n-1)$$

$$a_n = 5n - 12$$

$$a_n = -9 + 4(n-1)$$

$$a_n = 4n - 13$$

$$a_n = 12 - 7(n-1)$$

$$a_n = -7n + 19$$

7. a) Find the 20th term of the sequence in 5a. _____

b) Find the 30th term of the sequence in 5b. _____

c) Find the 50th term of the sequence in 5c. _____

d) Find the 74th term of the sequence in 5d. _____

e) Find the 38th term of the sequence in 5e. _____

explicit
 $a_n = a_1 + d(n-1)$

recursive
 $a_1 = ?$
 $a_n = a_{n-1} + d$

Name key Date _____ Period _____

Explicit and Recursive Equations From Arithmetic Sequences

Find the next three terms of each arithmetic sequence, write the explicit and recursive formula:

1. 9, 16, 23, 30, 37, 44, 51

Explicit: $a_n = 9 + 7(n-1)$
 $a_n = 7n + 2$

Recursive: $a_1 = 9$
 $a_n = a_{n-1} + 7$

2. 31, 24, 17, 10, 3, -4, -11

Explicit: $a_n = 31 + -7(n-1) \rightarrow -7n + 38 = a_n$

Recursive: $a_1 = 31$
 $a_n = a_{n-1} + 31$

3. -6, -2, 2, 6, 10, 14, 18

Explicit: $a_n = -6 + 4(n-1)$

Recursive: $a_n = 4n - 10$

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

4. -8, -5, -2, 1, 4, 7, 10

$a_n = 3 + 3(n-1)$
 $a_n = 3n - 11$

Explicit:

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

5. 12, 16, 20, 24, 28, 32, 36

$a_n = 12 + 4(n-1)$
 $= 12 + 4n - 4$

$a_n = 4n + 8$

Explicit:

Recursive: $a_1 = 12$
 $a_n = a_{n-1} + 4$

6. 3, 1, -1, -3, -5, -7, -9

$a_n = 3 + -2(n-1)$

$a_n = -2n + 5$

Explicit:

Recursive: $a_1 = 3$
 $a_n = a_{n-1} - 2$

7. 14, 12, 10, 8, 6, 4, 2

$a_n = 14 - 2(n-1)$

$a_n = -2n + 16$

Explicit:

Recursive: $a_1 = 14$
 $a_n = a_{n-1} + -2$

8. 17, 14, 11, 8, 5, 2, -1

$a_n = 17 + -3(n-1)$

$a_n = -3n + 20$

Explicit:

Recursive: $a_1 = 17$
 $a_n = a_{n-1} - 3$