Foundations of Algebra Name_____ ID: 1

Sequences Study Guide

Period____

For each sequence, state if it is arithmetic, geometric, or neither.

1) $-2,\ -8,\ -32,\ -128,\ -512, \ldots$

Geometric

2) $2,\ 10,\ 50,\ 250,\ 1250, \ldots$

Geometric

3) $7,\ 27,\ 127,\ 627,\ 3127, \ldots$

Neither

4) $27,\ 17,\ 7,\ -3,\ -13, \ldots$

Arithmetic

Find the common difference.

5) $4,\ -5,\ -14,\ -23, \ldots$

$d = -9$

6) $13,\ 113,\ 213,\ 313, \ldots$

$d = 100$

Find the explicit formula.

7) $-25,\ -15,\ -5,\ 5, \ldots$

$a_n = -35 + 10n$

8) $-6,\ 3,\ 12,\ 21, \ldots$

$a_n = -15 + 9n$

Given the explicit formula for an arithmetic sequence find the common difference and the first five terms.

9) $a_n = 6 + 7n$

Common Difference: $d = 7$
First Five Terms: $13,\ 20,\ 27,\ 34,\ 41$

10) $a_n = -11 + 7n$

Common Difference: $d = 7$
First Five Terms: $-4,\ 3,\ 10,\ 17,\ 24$

Given the first term and the common difference of an arithmetic sequence find the first five terms and the explicit formula.

11) $a_1 = -26,\ d = 7$

First Five Terms: $-26,\ -19,\ -12,\ -5,\ 2$
Explicit: $a_n = -33 + 7n$

12) $a_1 = 5,\ d = -10$

First Five Terms: $5,\ -5,\ -15,\ -25,\ -35$
Explicit: $a_n = 15 - 10n$

Find the common ratio.

13) $3,\ 18,\ 108,\ 648, \ldots$

$r = 6$

14) $2,\ -8,\ 32,\ -128, \ldots$

$r = -4$

Find the three terms in the geometric sequence after the last one given.

15) $-3,\ -15,\ -75,\ -375, \ldots$

$-1875,\ -9375,\ -46875$

16) $-1,\ -4,\ -16,\ -64, \ldots$

$-256,\ -1024,\ -4096$

Write thexplicit formula for the geometric sequence, then find the 8th term.

17) 1, 4, 16, 64, ...

$a_8 = 16384$

Explicit: $a_n = 4^{n-1}$

18) 2, −8, 32, −128, ...

$a_8 = -32768$

Explicit: $a_n = 2 \cdot (-4)^{n-1}$

Given the first term and the common ratio of a geometric sequence find the first five terms.

19) $a_1 = -2,\ r = 5$

−2, −10, −50, −250, −1250

20) $a_1 = 3,\ r = 2$

3, 6, 12, 24, 48

Given the first term and the common ratio of a geometric sequence find the 8th term and the explicit formula.

21) $a_1 = 2,\ r = 3$

$a_8 = 4374$

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

22) $a_1 = -2,\ r = 3$

$a_8 = -4374$

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

Given the explicit formula for a geometric sequence find the common ratio.

23) $a_n = 6^{n-1}$

$r = 6$

24) $a_n = -4 \cdot 4^{n-1}$

$r = 4$

Given the explicit formula for a geometric sequence find the common ratio and the first five terms.

25) $a_n = (-2)^{n-1}$

Common Ratio: $r = -2$

First Five Terms: 1, −2, 4, −8, 16

26) $a_n = 4^{n-1}$

Common Ratio: $r = 4$

First Five Terms: 1, 4, 16, 64, 256

27) What are similarities between the formula for an arithmetic sequence and the formula for a geometric sequences?

Both of the formulas include the a sub 1 and both formulas include the n-1.

28) What are some differences between an arithmetic and geometric sequence?

In an arithmetic sequence you are either adding or subtracting to get the next term. In a geometric sequence you are multiplying to get the next term.