

Warm-Up!

- Find the explicit rule for the following sequence

1. $3, -3, -9, -15, -21, -27$

Unit 2

Arithmetic and Geometric Series
Continued

Zero Term

- The following are arithmetic sequences. Find the explicit rule for the sequences. Find a_0 .
 1. $-2, 1, 4, 7, 10, \dots$
 2. $-17, -15, -13, -11, -9, \dots$
 3. $2, 13, 24, 35, 46, \dots$

Practice

- Find the zero term to make an explicit rule.
 1. $-5, 0, 5, 10, 15, 20, \dots$
 2. $-78, -56, -34, -12, \dots$
 3. $7, 11, 15, 19, 23, \dots$



Is this geometric or arithmetic?

- Find the common difference,
- 0, 6, 16, 30, 48, ...

Practice

- Determine the Explicit rule for the following.

1. 9, 18, 33, 54, ...

2. 1, 13, 33, 61, 97, ...

3. 1, -2, -7, -14, ...

Worksheet

Warm Up!

- Given the recursive rule

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

write out the first 4 terms

- Write the first 4 terms for the following,

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

Does it change our first 4 terms?

Unit 2

Understanding Functions

Standard/Objective

- F.IF.A.3-Writing Sequences explicitly and recursively as a function.
- Objective
 - Students will be able to write sequences explicitly and recursively.

Geometric Sequences

- Definition
 - A sequence where the difference between consecutive terms is a common ratio
- Example. Determine if the sequence is Geometric
 1. 2, 4, 8, 16, 32, 64, ...

Recursive Rules

Given the Recursive rule list the first 6 terms.

- $a_1 = -1, a_n = a_{n-1} * 2$
- $a_1 = 2, a_n = a_{n-1} * 3$
- $a_1 = 4, a_n = a_{n-1} * -1$

Recursive Sequences

- Find recursive rules for the following sequences.
 1. 1, -2, 4, -8 ...
 2. 1, 3, 9, 27, 81, ...
 3. 40, -20, 10, -5, ...

Recursive Rules Continued

- Determine the recursive rule for the following sequences, and find the 8th term.

1. 1, -5, 25, -125 ...

2. -2, -4, -8, -16, -32

Name: _____

Find the explicit sequence

① $7, 11, 15, 19, 23, \dots$

② $6, 4, 2, 0, -2, \dots$

③ $2, 8, 14, 20, 26, \dots$

④ $7, 13, 23, 37, \dots$

⑤ $-4, 5, 20, 41, \dots$

Find the recursive sequence

⑥ $3, 12, 48, 192, \dots$

⑦ $-5, 15, -45, 135, \dots$

⑧ $2, 4, 6, 8, 10, \dots$

⑨ $0, -4, -8, -12, \dots$

⑩ $-7, 1, 9, 17, 25, \dots$

⑪ $3, 6, 12, 24, 48, \dots$

4.3 Arithmetic and Geometric Sequences Worksheet

Period _____

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Determine if the sequence is arithmetic. If it is, find the common difference.

1) $-9, -109, -209, -309, \dots$

2) $28, 18, 8, -2, \dots$

3) $28, 26, 24, 22, \dots$

4) $-16, -6, 4, 14, \dots$

5) $-8, -4, 0, 4, \dots$

6) $1, \frac{1}{2}, 0, -\frac{1}{2}, \dots$

Find the common difference and the three terms in the sequence after the last one given.

7) $-39, -33, -27, -21, \dots$

8) $-27, -17, -7, 3, \dots$

9) $17, 13, 9, 5, \dots$

10) $\frac{1}{5}, \frac{23}{15}, \frac{43}{15}, \frac{21}{5}, \dots$

Find the common difference and the recursive formula.

11) $9, 19, 29, 39, \dots$

12) $22, 19, 16, 13, \dots$

13) $-3, 97, 197, 297, \dots$

14) $34, 43, 52, 61, \dots$

Find the common difference, the term named in the problem, and the explicit formula.

15) 17, 11, 5, -1, ...
Find a_{39}

16) 5, -5, -15, -25, ...
Find a_{20}

17) -40, -47, -54, -61, ...
Find a_{29}

18) -32, -132, -232, -332, ...
Find a_{40}

19) -8, 22, 52, 82, ...
Find a_{20}

20) 29, 38, 47, 56, ...
Find a_{29}

21) 36, 29, 22, 15, ...
Find a_{29}

22) -20, -29, -38, -47, ...
Find a_{20}

Determine if the sequence is geometric. If it is, find the common ratio.

23) -2, -10, -50, -250, ...

24) -1, 6, -36, 216, ...

25) -1, -5, -25, -125, ...

26) -2, 10, -50, 250, ...

27) -3, -1, $-\frac{1}{3}$, $-\frac{1}{9}$, ...

28) -2, $\frac{1}{2}$, $-\frac{1}{8}$, $\frac{1}{32}$, ...

Arithmetic Sequences

Date _____ Period _____

Determine if the sequence is arithmetic. If it is, find the common difference.

1) 35, 32, 29, 26, ...

2) -3, -23, -43, -63, ...

3) -34, -64, -94, -124, ...

4) -30, -40, -50, -60, ...

5) -7, -9, -11, -13, ...

6) 9, 14, 19, 24, ...

Given the explicit formula for an arithmetic sequence find the first five terms and the term named in the problem.

7) $a_n = -11 + 7n$
Find a_{34}

8) $a_n = 65 - 100n$
Find a_{39}

9) $a_n = -7.1 - 2.1n$
Find a_{27}

10) $a_n = \frac{11}{8} + \frac{1}{2}n$
Find a_{23}

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

11) $a_1 = 28, d = 10$

12) $a_1 = -38, d = -100$

13) $a_1 = -34, d = -10$

14) $a_1 = 35, d = 4$

Comparing Arithmetic and Geometric Sequences

Date _____ Period _____

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

1) 1, 3, 6, 10, 15, ...

2) 40, 43, 46, 49, 52, ...

3) $4, \frac{13}{3}, \frac{14}{3}, 5, \frac{16}{3}, \dots$

4) -4, 12, -36, 108, -324, ...

5) 4, 16, 36, 64, 100, ...

6) -29, -34, -39, -44, -49, ...

7) 1, 5, 25, 125, 625, ...

8) 1, 4, 9, 16, 25, ...

9) -34, -26, -18, -10, -2, ...

10) 0, 3, 8, 15, 24, ...

11) $a_n = -163 + 200n$

12) $a_n = 16 + 3n$

13) $a_n = -4 \cdot (-3)^{n-1}$

14) $a_n = -\frac{3}{4} + \frac{3}{2}n$

Geometric Sequences

Date _____ Period _____

Determine if the sequence is geometric. If it is, find the common ratio.

1) $-1, 6, -36, 216, \dots$

2) $-1, 1, 4, 8, \dots$

3) $4, 16, 36, 64, \dots$

4) $-3, -15, -75, -375, \dots$

5) $-2, -4, -8, -16, \dots$

6) $1, -5, 25, -125, \dots$

Given the explicit formula for a geometric sequence find the first five terms and the 8th term.

7) $a_n = 3^{n-1}$

8) $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

9) $a_n = -2.5 \cdot 4^{n-1}$

10) $a_n = -4 \cdot 3^{n-1}$

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

11) $a_n = a_{n-1} \cdot 2$
 $a_1 = 2$

12) $a_n = a_{n-1} \cdot -3$
 $a_1 = -3$

13) $a_n = a_{n-1} \cdot 5$
 $a_1 = 2$

14) $a_n = a_{n-1} \cdot 3$
 $a_1 = -3$

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

15) $a_1 = 0.8, r = -5$

16) $a_1 = 1, r = 2$

Given the first term and the common ratio of a geometric sequence find the recursive formula and the three terms in the sequence after the last one given.

17) $a_1 = -4, r = 6$

18) $a_1 = 4, r = 6$

19) $a_1 = 2, r = 6$

20) $a_1 = -4, r = 4$

Given a term in a geometric sequence and the common ratio find the first five terms, the explicit formula, and the recursive formula.

21) $a_4 = 25, r = -5$

22) $a_1 = 4, r = 5$

Given two terms in a geometric sequence find the 8th term and the recursive formula.

23) $a_4 = -12$ and $a_5 = -6$

24) $a_5 = 768$ and $a_2 = 12$

25) $a_1 = -2$ and $a_5 = -512$

26) $a_5 = 3888$ and $a_3 = 108$

