

Warm Up 11/(The average age you graduate from high school)

GET A CALCULATOR!

1) The fourth term of a sequence is 108.
Each term after the first is 3 times the previous term.
Write an explicit formula for the sequence.

$$\text{Explicit: } a_n = 4(3)^{n-1}$$

Check Homework

Find the explicit formula for the sequence.
Then find the indicated term of the sequence.

10, 16, 22, 28, ... 15th term

$$\text{Explicit: } a_n = 10 + 6(n - 1)$$

94

Find the explicit formula for the sequence.
Then find the indicated term of the sequence.

$a_4 = 37$ $d = 10$ 100th term:

$$\text{Explicit: } a_n = 7 + 10(n - 1)$$

997

Find the explicit formula for the sequence.
Then find the indicated term of the sequence.

$a_3 = 32$ $r = 2$; 12th term

$$\text{Explicit: } a_n = 8(2)^{n-1}$$

16,384

Find the explicit formula for the sequence.
Then find the indicated term of the sequence.

16, 80, 400, 2000, ...10th term

$$\text{Explicit: } a_n = 16(5)^{n-1}$$

31, 250, 000

Write an Explicit Rule for this Sequence
(The Fibonacci Sequence)

1, 1, 2, 3, 5, 8, ...

I am thinking of a sequence...

- The first term is 8.
- Can you tell me the sequence?

I am thinking of a sequence...

- With each term, I am adding 4.
- Can you tell me the sequence?

I am thinking of a sequence...

- The first term is 13. I multiply the previous term by 2 to get the next term.
- Can you tell me the sequence?

Recursive Rules

- An explicit rule tells you how to get a specific term in a sequence.
- A **recursive rule** is a different way of describing the sequence. It focuses less on finding specific terms and focuses more on the general pattern of the sequence. **It tells you where the sequence starts, and how it changes from term to term.**

Recursive Rules

- **10, 16, 22, 28, ...**
- **FIRST TERM = 10**
- **ANY TERM = PREVIOUS TERM + 6**
- How do we write "first term"?
- How do we write "any term"?
- How could we write "previous term"?

Recursive Rules

- 10, 16, 22, 28, ...
 - **FIRST TERM** = 10
 - **ANY TERM** = **PREVIOUS TERM** + 6
- $a_1 = 10$
- $a_n = a_{n-1} + 6$ Why do we need both parts of this?

You can also do it this way...

- 10, 16, 22, 28, ...
 - **FIRST TERM** = 10
 - **NEXT TERM** = **CURRENT TERM** + 6
- $a_1 = 10$
- $a_{n+1} = a_n + 6$

What are the first four terms of the sequence defined by the Recursive Rule?

$$a_1 = 4$$

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

4, 9, 14, 19

What are the first four terms of the sequence defined by the Recursive Rule?

$$a_1 = 4$$

$$a_n = 5 \cdot a_{n-1}$$

4, 20, 100, 500

What are the first four terms of the sequence defined by the Recursive Rule?

$$a_1 = 4$$

$$a_{n+1} = a_n + 8$$

4, 12, 20, 28

What are the first four terms of the sequence defined by the Recursive Rule?

$$a_1 = 4$$

$$a_{n+1} = 3 \cdot a_n$$

4, 12, 36, 108

Write a recursive rule for the sequence.

8, 6.6, 5.2, 3.8, ...

$$a_1 = 8$$

$$a_n = a_{n-1} - 1.4$$

Write a recursive rule for the sequence.

3, 15, 75, 375, ...

$$a_1 = 3$$

$$a_n = 5 \cdot a_{n-1}$$

Write the explicit rule AND the recursive rule for the sequence.

15, 26, 37, 48, ...

Explicit: $a_n = 15 + 11(n - 1)$

Recursive: $a_1 = 15$

$$a_n = a_{n-1} + 11$$

Write the explicit rule AND the recursive rule for the sequence.

3, 12, 48, 192, ...

Explicit: $a_n = 3(4)^{n-1}$

Recursive: $a_1 = 3;$

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

Alternate notation for sequences...

- Although sequence notation is the most common way to write sequences, you can also use function notation.

- a_n can also be written as $f(n)$

- a_{n-1} can also be written as $f(n - 1)$

- a_{12} can also be written as $f(12)$

- etc.

Write the explicit rule AND the recursive rule for the sequence. Use function notation!

3, 23, 43, 63, ...

Explicit: $f(n) = 3 + 20(n - 1)$

Recursive: $f(1) = 3;$

$$f(n) = f(n - 1) + 20$$

Write the explicit rule AND the recursive rule for the sequence. Use function notation.

6, 12, 24, 48, ...

Explicit: $f(n) = 6(2)^{n-1}$

Recursive: $f(1) = 6;$

$f(n) = 2 \cdot f(n - 1)$

Homework

• Worksheet

• **PLEASE CHANGE #1 TO:**

• **-12, -17, -22, -27, ...**