

**DO NOW**

Using the following sequence

 $\{4, -6, -16, -26, \dots\}$ 

A) Identify if it is arithmetic or geometric

Add  $-10 = d$ Common  
difference

B) Find the 9th term

$$a_9 = -76$$

Feb 13-7:47 AM

## HW Answer

1. D

6.  $a_{10} = -100$ 

2. B

7a. C

3. C

7b.  $a_6 = 43$ 

4. A

8. B

5.  $a_1 = 2$ 

9. B

 $a_2 = 5$ 

10. D

 $a_3 = 10$ 

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

$$a_{10} = (-1)^{10-1} \cdot (10)^2$$

$$a_n = (-1)^9 \cdot 100$$

$$a_{10} = -1 \cdot 100$$

$$a_{10} = -100$$

Jan 25-7:24 AM

**Writing an explicit formula for an Arithmetic Sequence:**

1. Determine if the sequence is arithmetic (Do you add the same amount from one term to the next?)

2. Find the common difference (The number you add.)

"d"

→ pattern rule

3. Create an explicit formula using the pattern:

$$a_n = a_1 + d(n - 1) \quad \text{OR} \quad f(n) = f(1) + d(n - 1)$$

$a_n = f(n)$  = the  $n^{\text{th}}$  term in the sequence

$a_1 = f(1)$  = the first term in the sequence

$n$  = the term number

$d$  = the common difference

Arithmetic  
Sequence

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

Feb 22-10:10 AM

**Geometric Sequences - Explicit Form**

1. Determine if the sequence is geometric (Do you multiply the same amount from one term to the next?)

2. Find the common ratio (The number you multiply)

"r"

$$r = \frac{\text{2nd term}}{\text{1st term}}$$

3. Create an explicit formula using:

$$a_n = a_1 \cdot (r)^{n-1} \quad \text{OR} \quad f(n) = f(1) \cdot (r)^{n-1}$$

$a_n = f(n)$  = the  $n^{\text{th}}$  term in the sequence

$a_1 = f(1)$  = the first term in the sequence

$n$  = the term number

$r$  = the common ratio

Geometric  
Sequence

$$a_n = a_1 r^{n-1}$$

Feb 22-10:06 AM

Sequence: {35, 30, 25, 20, 15, 10, ...}. Find an explicit formula.

First term ( $a_1$ ) = 35

Common difference ( $d$ ) = -5

Explicit Formula

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

Subscript Notation:  $a_n = 35 + (n-1)(-5)$

$$a_n = 35 - 5n + 5$$

$$f(n) = f(1) + (n-1)d \quad a_n = -5n + 40$$

Function Notation:  $f(n) = 35 + (n-1)(-5)$

$$f(n) = -5n + 40$$

Use the formula you wrote to find the 100<sup>th</sup> term of this sequence.

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Feb 22-10:13 AM

Sequence: {2, 14, 98 ...}. Find an explicit formula.

First term ( $a_1$ ) = 2

Common ratio ( $r$ ) =  $\frac{14}{2} = 7$

$$a_n = a_1(r)^{n-1}$$

Explicit Formula

Subscript Notation:  $a_n = 2(7)^{n-1}$

$$f(n) = f(1)(r)^{n-1}$$

Function Notation:  $f(n) = 2(7)^{n-1}$

Feb 22-10:13 AM

Sequence:  $\{3, 6, 12, 24, 48, 96, \dots\}$ . Find an explicit formula.

First term ( $a_1$ ) = 3      Common ratio ( $r$ ) = 2

Explicit Formula

Subscript Notation:  $a_n = 3(2)^{n-1}$

$a_n = a_1(r)^{n-1}$

Function Notation:  $f(n) = 3(2)^{n-1}$

$f(n) = f(1)(r)^{n-1}$

What is  
the 15<sup>th</sup> term?

$n = 15$

$A_{15} = 3(2)^{15-1}$

$A_{15} = 49152$

Feb 22-10:13 AM

Write an explicit rule for each sequence:

1) 1, 10, 100, 1000, ...  $a_n = 1(10)^{n-1}$

2)  $\left\{1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \dots\right\}$   $a_n = 1\left(\frac{1}{2}\right)^{n-1}$  or  $a_n = 1(.5)^{n-1}$

3)

$n$	1	2	3	4	...
$f(n)$	2	4	8	16	...

4) 54, 18, 6, 2, ...

Feb 24-10:48 AM