DO NOW

If $f(1) = 3$ and $f(n) = -2f(n - 1) + 1$, find $f(5)$.

$f(2) = -2f(2-1)+1$
$f(2) = -2f(1)+1$
$f(2) = -2(3)+1$
$f(2) = -6+1$
$f(2) = -5$

$f(3) = -2f(3-1)+1$
$f(3) = -2f(2)+1$
$f(3) = -2(-5)+1$
$f(3) = 11$

$f(4) = -2f(4-1)+1$
$f(4) = -2f(3)+1$
$f(4) = -2(11)+1$
$f(4) = -22+1$
$f(4) = -21$

$f(5) = -2f(5-1)+1$
$f(5) = -2f(4)+1$
$f(5) = -2(-21)+1$
$\boxed{f(5) = 43}$

8) b) $a_n = a_1 + d(n-1)$
$a_1 = -5$ $a_n = -5 + 6(n-1)$
$d = 6$

5) $f(k+1) = 2f(k) - 1$
$f(1) = 3$

$f(2)$
$f(k+1) = 2f(k) - 1$
$f(1+1) = 2f(1) - 1$
$f(2) = 2(3) - 1$
$f(2) = 5$

$f(3)$
$f(2+1) = 2f(2) - 1$
$f(3) = 2(5) - 1$
$f(3) = 9$

Feb 24-10:36 AM

Geometric Sequences - Explicit Form

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

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

3. Create an explicit formula using:

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

$a_n = f(n)$ = the nth term in the sequence

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

n = the term number

r = the common ratio

Feb 22-10:06 AM

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

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

Explicit Formula

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

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

Feb 22-10:13 AM

Write an explicit rule for each sequence:

1) 1, 10, 100, 1000, ...

2) $\left\{1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \ldots\right\}$

3)

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

$a_1 = 2$ $r = 2$

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

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

$a_1 = 54$
$r = \frac{1}{3}$

$a_n = 54\left(\frac{1}{3}\right)^{n-1}$

Feb 24-10:48 AM

Finding the nth term of a Geometric Sequence

5) Find the 9th term given $a_1 = -15$ and $r = 3$

$a_n = -15(3)^{n-1}$
$a_9 = -15(3)^{9-1}$
$a_9 = -15(3)^8$
$\boxed{a_9 = -98,415}$

6) Find the 10th term of the geometric sequence with $a_1 = \frac{1}{2}$ and $r = 4$

Feb 25-7:26 AM

Geometric Sequences - Recursive Form

Subscript notation

a_1 = first term ; $a_n = r \cdot a_{n-1}$

Function notation

$f(1)$ = first term ; $f(n) = r \cdot f(n - 1)$

Feb 25-10:43 AM

Write a recursive function for each sequence:

1) 8, 24, 72, 216, ... $a_1 = 8;\ a_n = 3 \cdot a_{n-1}$

$a_1 = 8 \quad r = 3$

2)

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

$f(1) = 2 \quad r = 2$ $\boxed{f(1) = 2;\ f(n) = 2 \cdot f(n-1)}$

3) 54, 18, 6, 2, ...

$a_1 = 54$

$r = \frac{1}{3}$

$\boxed{a_1 = 54;\ a_n = \frac{1}{3} \cdot a_{n-1}}$

Feb 25-10:47 AM

A geometric sequence is shown in the table below, where an represents the nth term of the sequence. What is the recursive formula for the geometric sequence?

a) $a_{n+1} = a_n^2$

b) $a_{n+1} = a_n + 3$

c) $a_{n+1} = 2a_n$

d) $a_{n+1} = 4a_n$

a_n	Value
a_1	1
a_2	4
a_3	16
a_4	64
a_5	216

Feb 25-10:48 AM

HOMEWORK

Workbook

p. 499 #1 - 3

p. 501 # 1 - 10

Feb 25-7:37 AM

7) Write a rule for the nth term of the geometric sequence 2, -8, 32, -128,.... Then find a_8.

8) What is the fifteenth term of the sequence 5, -10, 20, -40, 80,...?

a) -163, 840 c) 81,920
b) -81,920 d) 327,680

Feb 25-7:31 AM

9) In a geometric sequence $r = -2$ and $a_3 = 16$.
a. Find the value of a_1
b. Write the rule for the nth term of this sequence.

10) In a geometric sequence $r = 3$ and $a_2 = 12$.
a. Find the value of a_1
b. Write the rule for the nth term of this sequence.

Jan 27-2:29 PM