4-2 Finite Geometric Series

Objectives:

- I can write a series using sigma notation
- I can find the sum of a series

Jun 3-1:09 PM

Warm - up

1. Write a ~~recursive rule and~~ an explicit rule for the sequence:
9, 27, 81, 243

$f(n) = 9(3)^{n-1}$

2. Find the stated term of the geometric sequence:
-3, -6, -12, -24, … ; 9th term

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

$f(9) = -3(2)^{9-1}$

$= -3(2)^{8}$

$= -768$

Jan 4-4:52 PM

You have 2 biological parents, 4 biological grandparents, and 8 biological great-grandparents. How many great-great-great-great grandparents (6th generation) do you have?

1 2 3 4 5 6

2, 4, 8, 16, 32, 64

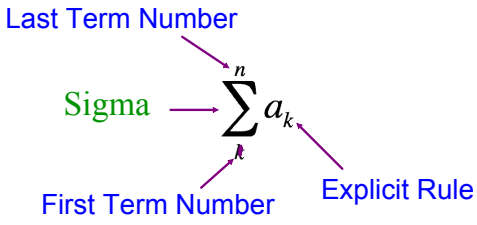
$f(n) = 2(2)^{n-1}$

How many total ancestors do you have if you trace your ancestry back 6 generations?

$2 + 4 + 8 + 16 + 32 + 64 = 126$

Jun 3-1:20 PM

Series: adding together all the numbers in a sequence



Summation notation: $\sum_{k=1}^{n} a_k = a_1 + a_2 + a_3 + \ldots + a_n$

Dec 15-8:53 AM

Find the following sums:

a. $\sum_{k=1}^{5} 3k$ $= 3(1) + 3(2) + 3(3) + 3(4) + 3(5)$
$= 3 + 6 + 9 + 12 + 15$
$= 45$

b. $\sum_{k=5}^{8} k^2$

c. $\sum_{k=3}^{7} 4k+1$

Under math button on the calculator

Jun 3-1:34 PM

Process

- Determine the common ratio
- Write an explicit rule
- Figure out how many total terms
- Write in sigma notation
- Evaluate on calculator

Aug 23-3:21 PM

Write the following in sigma notation and then find the sum

A geometric series that begins with 3, a common factor of 2, with 6 terms

$\sum_{n=1}^{6} 3(2)^{n-1} =$

A geometric series that begins with 5, a common factor of 3, with 7 terms

$\sum_{n=1}^{7} 5(3)^{n-1}$

Jan 7-10:51 AM

Find the sum of the series:

1 2 3 6 4 5
4, 8, 16, ..., 128 32, 64

$\sum_{n=1}^{6} 4(2)^{n-1} = 252$

1 2 3 6 4 5
3, 9, 27,...., 729 81, 243

Jun 3-1:36 PM

Find the sum of the series

2, -8, 32,...., -2048

-3, 6, -12, ..., 96

Aug 23-3:26 PM