Warm Up

Turn and Talk...

1. What do you think recursion means?
2. What is a sequence?
3. What is a term?
4. What is an Arithmetic Sequence?
5. What is a Geometric Sequence?

Unit 1
Sequences and Series

Recursion

Each step of a pattern is dependent on the previous step

Sequence

An ordered list of numbers (example: 2, 4, 6, ...)

Term

Each member of a sequence is called a term

Notation:

$u_1 = 2$ (1st term)

$u_3 = 6$ (2nd term)

$u_n = n^{th}$ term

Arithmetic Sequence

An adding sequence -- we find the next term by adding (or subtracting) to the previous term.

Notation: u_1 = first term

Geometric Sequence

A multiplication sequence -- we find the next term by multiplying (or dividing) the previous term.

Notation: u_0 = first term

Arithmetic sequences

We talk about the *common difference* or what the pattern is changing by

$u_3 - u_2 = d$ (common difference)

$u_{10} - u_9 = d$

Geometric sequences

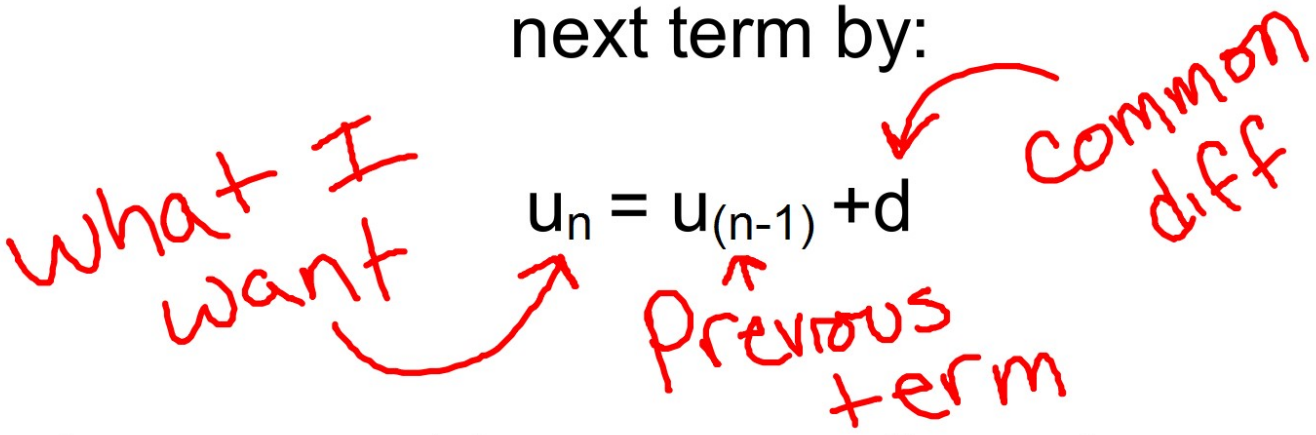
We talk about the *common ratio* or what the pattern is changing by

$u_3/u_2 = r$ (common ratio)

$u_{10}/u_9 = r$

Recursive Rules

In an arithmetic sequence we can find the next term by:



In a geometric sequence the subsequent term is found by:

$$u_n = u_{(n-1)} * r$$

Summary

Geometric Sequence	Arithmetic Sequence
First term is U_0	First term is U_1
Multiplying (or dividing)	Adding (or subracting)
Common ratio (r)	Common difference (d)
Next term: $u_n = u_{(n-1)} * r$	Next term: $u_n = u_{(n-1)} + d$

1) Write the first 4 terms of each sequence.

a) $u_1 = 20$

$u_n = u_{(n-1)} + 6$ ~~where n>2~~

b) $u_1 = 47$

$u_n = u_{(n-1)} - 3$ ~~where n>2~~

c) $u_0 = 32$

$u_n = 1.5 * u_{(n-1)}$ ~~where n>1~~

d) $u_1 = -18$

$u_n = u_{(n-1)} + 4.3$ ~~where n>2~~

$U_n = U_{(n-1)} + 6$

$U_6 = U_5 + 6 = 44 + 6 = 50$

20, 26, 32, 38, (44), ...

1st 2nd 3rd 4th 5th

n = 1 2 3 4 5