

Notes 1.6 - Sequences

No Warmup - Quiz today

Lesson

Word	Meaning/Notation	Example
Recursive Equation (Geometric)	Applying a rule to a previous term, you <u>must</u> include the first term	$new = previous \cdot rule$ first term is _____ <hr/> $f(n) = rule \cdot f(n-1)$ $f(1) = value$ or $f(0) = value$
Explicit Equation (Geometric)	An equation that allows you to find any term in a sequence	$f(n) = b(a)^n$ $a = common\ ratio$ $b = value\ at\ n=0$

A scientist is doing an experiment on the growth of cells. At the end of each day she counted the number of cells in the petri dish, she recorded her results in the following table.

Day	Cells	Change	Product
0	$\frac{5}{2}$		
1	5		
2	10	$\cdot 2$	
3	20	$\cdot 2$	
4	40	$\cdot 2$	
5	80	$\cdot 2$	
6	160		
7	320		

Recursive Equation:  
 $new = previous \cdot 2$   
 first term is 5  


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 $f(n) = 2 \cdot f(n-1)$      $f(1) = 5$

Explicit Equation:  
 $f(n) = \frac{5}{2} (2)^n$

How many cells will there be on the 23<sup>rd</sup> day?

$$f(23) = \frac{5}{2} (2)^{23} = 20,971,520 \text{ cells on the } 23^{rd} \text{ day}$$

~~How do you know whether to use n or n-1?~~

Complete each table and then write the equations for the info in the table.

Term	Value	Change	Product
1	3		3
2	12	.4	3.4
3	48	.4	3.4.4
4	192		3.4.4.4
5	768		
6	3072		

0  $\frac{3}{4}$  or .75

Recursive Equation:  
 new = previous  $\cdot 4$   
 first term is 3

$$f(n) = 4 \cdot f(n-1) \quad f(1) = 3$$

Explicit Equation:

$$f(n) = \frac{3}{4} (4)^n$$

Term	Value	Change	Product
1	1701		1701
2	567	$\cdot \frac{1}{3}$	1701 $\cdot \frac{1}{3}$
3	189	$\cdot \frac{1}{3}$	1701 $\cdot \frac{1}{3} \cdot \frac{1}{3}$
4	63		
5	21		
6	7		

0 5103

Recursive Equation:  
 new = previous  $\cdot \frac{1}{3}$   
 first term is 1701

$$f(n) = \frac{1}{3} \cdot f(n-1)$$

Explicit Equation:  $f(1) = 1701$

$$f(n) = 5103 \left(\frac{1}{3}\right)^n$$

Term 2  $\div$  Term 1 = common ratio