1 Arithmetic +/- 3+6+9 vs. 2 Geometric ×/÷ 3,6,12,24

initial term 3 constant diff +3 initial term 3 Constant Ratio

Explicit function $f(x)=3x$ Explicit $f(x)=3\cdot2^{x-1}$ Recursive $f(1)$

Recursive $f(x)=f(x-1)+3$
$f(1)=3$

3 Geometric 5,10,20
initial term 5
constant ×2

initial term 7 constant diff +5
Explicit function $f(x)=5\cdot2^{x-1}$

recursive $f(x)=f(x-1\cdot2$
Recursive $f(x)=f(x-1)\cdot2$
$f(1)=5$

explicit $f(x)=5(x-1)$

Initial value = I
Constant difference = D
Recursive function $f(1)=\boxed{I}$ $f(x)=f(x-1)+D$
Explicit function:

General Rules
Initial value
Constant Ratio = R
Recursive Function

Date: September 10th 2015 Arithmetic VS. Geometric

Arithmetic +/-	Geometric ×/÷
#1	#1
initial term 3	initial term 3
Constant difference +3	Constant ratio ·2
Explicit function $f(x)=3x$	Explicit function $f(x)=3\times2^{x-1}$
Recursive function $f(x)=f(x-1)+3$	Recursive function $f(x)=f(x-1)\cdot2$, $f(1)=3$
#2	#2
initial term ___ constant difference ___	initial term 5
Recursive $f(x)=f(x-1)+5$ $f(1)=7$	Constant ratio ·2
Explicit $7+5(x-1$	Explicit $f=5\times2^{x-1}$
Constant Change +5	Recursive $f(x)=f(x-1)\cdot2$
General rules	General rules
Initial Value = I	Initial Value
Constant difference = D	Constant ratio
Recursive function	Recursive function
Explicit Function	Explicit function

Arithmetic vs Geometric

Summary:

Arithmetic:

initial term 3 constant difference +3

Explicit function $f(x)=3x$ recursive function. $f(x)=f(x-1)+3$

$f(1)=3$

I.T.: 7

C.R.: +5

Explicit: $f(x)=7+5(x-1)$

Recursive:

$f(x)=f(x)+5$

$f(1)=7$

General rules:

Inital term I

constant diff. D

Recursive function:

$f(x-1)+d$ explicit: $f(x)=I+D(x-1)$ not always

$f(1)=I$

$f(0)=I \Rightarrow$ if starts at 0 always -1

Geometric:

initial term 3 constant ratio ×2

Explicit functions $f(x)=3\cdot2^{(x-1)}$ recursive function $f(x)=f(x-1)\cdot2$

Initial term: 5

Constant ratio: ×2

Explicit: $f(x)=5\cdot2^{(x-1)}$

recursive: $f(x)=f(x-1)\cdot2$

$f(1)=5$

*Distribute to simplify.

General Rules: check explicit by plugging something in

Inital term I

constant ratio R

Recursive function:

$f(x)=f(x-1)\cdot R$ not always $x-1$

$f(1)=I$

Explicit: $f(x)=I\cdot R^{(x-1)}$

Arithmetic vs Geometric summary

Arithmetic

3, 6, 9, 12 . . .

initial term - 3

Constant difference - +3

Explicit function - $f(x) = 3x$

Recursive function - $f(x) = f(x-1) + 3$

initial term - 7

constant difference - +5

Explicit - $f(x) = 7 + 5(x-1)$

Recursive - $f(x) = f(x-1) + 5$ $f(1) = 7$

Geometric

3, 6, 12, 24 . . .

initial term - 3

constant difference - ×2

Explicit function - $3 \cdot 2^{(x-1)}$

recursive function - $f(x) = f(x-1) \times 2$ $f(1) = 3$

x	y	P	R
1	3	3	$f(1) = 3$
2	6	$3 \cdot 2$	$f(2) = f(1) \times 2$
3	12	$3 \cdot 2 \cdot 2$	$f(3) = f(2) \times 2$
4	24	$3 \cdot 2 \cdot 2 \cdot 2$	$f(4) = f(3) \times 2$

5, 10, 20. . .

initial term - 5

Constant difference - ×2

Explicit - $f(x) = 5 \cdot 2^{x-1}$

Recursive - $f(x) = f(x-1) \cdot 2$ $f(1) = 5$

General Rules

initial terms = I

Constant difference = D

Recursive function = $f(x) = f(x-1) + D$

$f(1) = I$

Explicit function = $f(x) = I + D(x-1)$

not always $x-1$ plug in to check

General Rules

initial term = I

Constant Ratio = R

Recursive function = $f(x) = f(x-1) \cdot R$

$f(1) = I$

Explicit function = $f(x) = I \cdot R^{x-1}$

Not always $x-1$ check by plugging in