

Formulas of Geometric Sequences

Recursive - uses the **previous term**

Ex: first term $f(1) = 1$
 new = previous $\cdot r$ $f(n) = r \cdot f(n-1)$

sequence: 2, 8, 32, 128 $r = 4$

n	f(n)	expanded
1	2	$2 \cdot 4^0$
2	8	$2 \cdot 4^1$
3	32	$2 \cdot 4 \cdot 4 = 2 \cdot 4^2$
4	128	$2 \cdot 4^3$
n	$2 \cdot 4^{(n-1)}$	

Recursive

$f(1) = 2$
 $f(n) = f(n-1) \cdot 4$

Explicit - defined **in terms of n**

Ex: $f(n) = f(1) \cdot r^{(n-1)}$
 1st term | common ratio | one less than the term

Sequence: 51, 17, $\frac{17}{3}$, $\frac{17}{9}$... $r = \frac{1}{3}$

n	f(n)	expanded
1	51	$51 \cdot \frac{1}{3}^0$
2	17	$51 \cdot \frac{1}{3}^1$
3	$17/3$	$51 \cdot \frac{1}{3}^2$
4	$17/9$	$51 \cdot \frac{1}{3}^3$
n	$51 \cdot \frac{1}{3}^{(n-1)}$	

Explicit

$f(n) = 51 \cdot \frac{1}{3}^{(n-1)}$