Formal Definitions

Arithmetic: Add or subtract the same # repeatedly

Common Difference: d

Recursive

$f(0) = \#$ or $f(1) = \#$ ← where to start

$f(n) = f(n-1) + d$ ← how to get to the next term

Ex: $f(1) = 9$ Find $f(300)$

$f(n) = f(n-1) - 2$

9, 7, 5, 3...

Explicit

$f(n) = f(1) + d(n-1)$

or

$f(n) = f(0) + dn$

Ex: $f(n) = 9 - 2(n-1)$

9, 7, 5, 3, ... $f(300) = 9 - 2(300-1)$

$= -589$

Geometric: multiply by the same # repeatedly

Common ratio: r

Recursive

$f(0) = \#$ or $f(1) = \#$

$f(n) = r \cdot f(n-1)$

Ex: $f(1) = 2$

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

2, 3, 4.5, 6.75, ...

Explicit

$f(n) = f(1) \cdot r^{(n-1)}$

or

$f(n) = f(0) \cdot r^{n}$

Ex: $f(n) = 2\left(\frac{3}{2}\right)^{(n-1)}$

2, 3, 4.5, 6.75, ...

$f(20) = 2\left(\frac{3}{2}\right)^{(20-1)}$

$= 4433.67564$