Arithmetic vs. Geometric

	Arithmetic	Geometric
Function	Linear	Exponential
Need to know	d = common difference Adding/Subtracting	r = common ratio Multiplying/Dividing
Recursive	$a_1 =$ first term $a_n = a_{n-1} + d$	$a_1 =$ first term $a_n = a_{n-1} \cdot r$
Explicit	$a_n = a_1 + (n-1)d$	$a_n = a_1(r)^{n-1}$

Is this Arithmetic or Geometric?

-8, -6, -4, ...

+2 +2

Arithmetic: -6 - (-8) = 2; -4 - (-6) = 2

Geometric: -6/-8 = .75 (3/4); -4/-6 = .66 (2/3)

Write the Explicit rule? $a_n = a_1 + (n-1)d$

Step 1: Find first term and common difference.

$a_1 = -8$

d = 2

Step 2: Substitute first term and common difference in to the explicit formula.

$a_n = -8 + (n-1)2$

Step 3: Simplify the equation:

$a_n = -8 + (n-1)2$

$a_n = -8 + 2n - 2$

$a_n = -10 + 2n$ or $a_n = 2n - 10$

Is this Arithmetic or Geometric?

4, 8, 16, ...

Arithmetic: 8 - 4 = 4, 16 - 8 = 8

Geometric: 8/4 = 2, 16/8 = 2

What is the 15th term? (use explicit form): $a_n = a_1(r)^{n-1}$

Step 1: Find the first term and common ratio.

$a_1 = 4$

common ratio: 2

Step 2: substitute the first term and common ration into the formula.

$a_n = 4(2)^{n-1}$

Step 3: substitute the term you are looking for in for n.

$a_{15} = 4(2)^{15-1}$

Answer: $a_{15} = 65,536$