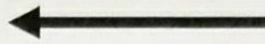


NOTES: Exponential Sequences (Geometric)

Geometric Sequence Formulas

Recursive: $a_n = r(a_{n-1})$

Explicit: $a_n = a_1 \cdot r^{n-1}$



This is STRAIGHT from the EOC formula sheet

What are the variables?

USED IN BOTH:

a_n : THE OUTPUT VARIABLE

r : COMMON RATIO (WHAT IS MULTIPLIED TO EACH TERM)

USED IN RECURSIVE

a_{n-1} : THE PREVIOUS TERM

USED IN EXPLICIT

n : THE TERM IN THE SEQUENCE (FIRST, SECOND, THIRD, ...)

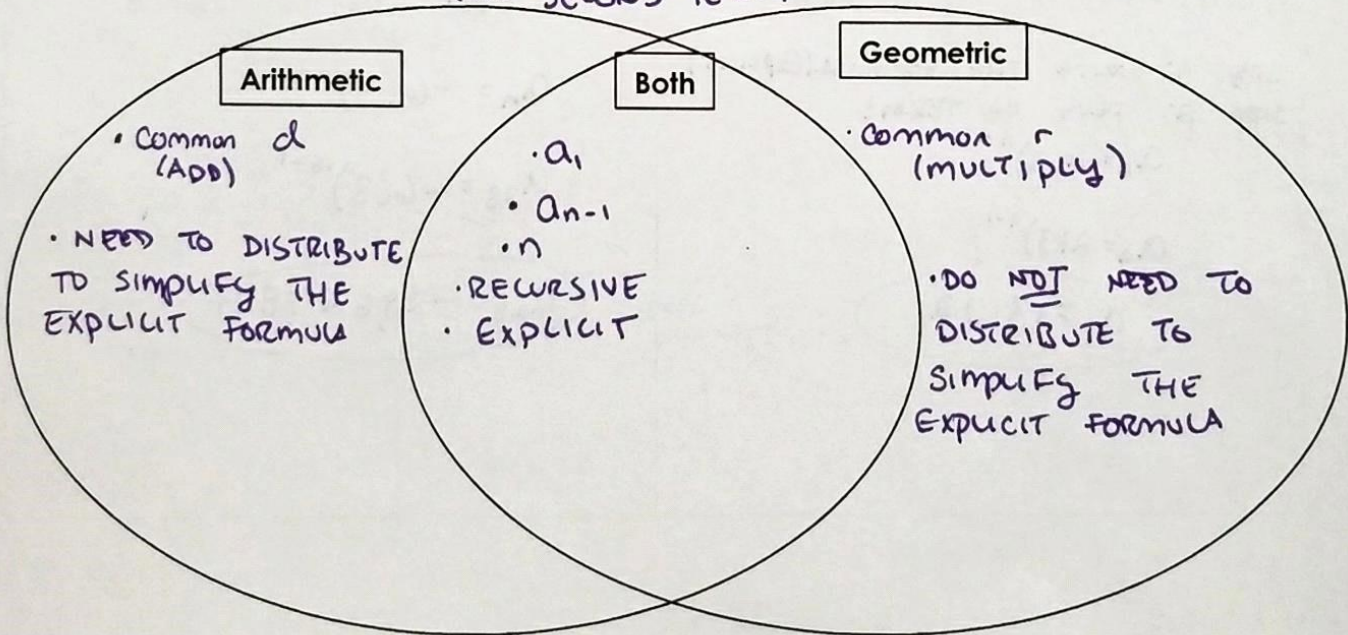
a_1 : THE OUTPUT OF THE FIRST TERM

4, 8, 16, 32,

$a_1 = \underline{4}$ $r = \underline{2}$

What is the 4th term? $a_4 = 32$

8 represents which term? ~~8~~
THE SECOND TERM



Examples

1) Write a recursive rule for the following sequence

5, 50, 500, 5000...

~~$a_n = 5 \cdot 10^{n-1}$~~

$$a_n = 10(a_{n-1}) \text{ or } a_n = 10a_{n-1}$$

2) Write a recursive rule for the following sequence

-4, -24, -144, -864...

$$a_n = 6a_{n-1}$$

3) Write an explicit rule for the following sequence

5, 50, 500, 5000...

$$a_n = 5(10)^{n-1}$$

4) Write an explicit rule for the following sequence

-4, -24, -144, -864...

$$a_n = -4(6)^{n-1}$$

5) What is the twentieth term of the sequence whose nth term is $a_n = -3(2)^{n-1}$

$$a_{20} = -3(2)^{20-1}$$

$$a_{20} = -1,572,864$$

6) What is the sixteenth term of the sequence whose nth term is $a_n = 2(-3)^{n-1}$

$$a_{16} = 2(-3)^{16-1}$$

$$a_{16} = -28,697,814$$

7) Find the 9th term of the sequence

2, 6, 18, 54, ...

STEP 1: WRITE THE FORMULA (EXPLICIT)
STEP 2: PLUG IN TERM!

$$a_n = 2(3)^{n-1}$$

$$a_9 = 2(3)^{9-1}$$

$$a_9 = 13,122$$

8) Find the ~~28~~¹⁶th term of the sequence

-6, -19, -54, -162, ...

$$a_n = -6(3)^{n-1}$$

$$a_{28} = -6(3)^{15-1}$$

$$a_{28} = -28,697,814$$