SEQUENCES

A NUMERICAL SEQUENCE

Definition Numerical Sequence

A **numerical sequence** is a list of numbers.

- The first number is called the 1^{st} term.
- The second number is called the 2^{nd} term.
- The third number is called the 3^{rd} term.
- And so on.

Ex: What is the 6^{th} term of this sequence?

n	1	2	3	4	5	6
n^{th} **term**	**3**	**5**	**7**	**9**	**11**	**13**

Answer: The 6^{th} term is 13.

B RECURSIVE DEFINITION

Definition Recursive Definition

We can define a sequence **recursively** if we know:

- the **first term** of the sequence,
- the **recursive rule** that tells how to get from one term to the next.

Ex: Find the first five terms in the sequence: start at 5 and add 3 each time.

Answer:

$$5 \xrightarrow{+3} 8 \xrightarrow{+3} 11 \xrightarrow{+3} 14 \xrightarrow{+3} 17$$

The first five terms are: 5, 8, 11, 14, 17.

C ARITHMETIC SEQUENCE

Definition Arithmetic Sequence

An **arithmetic sequence** is a list of numbers in which the same value is added or subtracted each time to get the next term.

Ex: What is the 6^{th} term of this sequence?

n	1	2	3	4	5	6
n^{th} **term**	**3**	**5**	**7**	**9**	**11**	?

Answer: The 6^{th} term is 13, because each term increases by 2.

1	2	3	4	5	6
3	5	7	9	11	13

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D GEOMETRIC SEQUENCE

Definition Geometric Sequence

A **geometric sequence** is a list of numbers in which the same value is multiplied or divided each time to get the next term.

Ex: What is the 5^{th} term of this sequence?

n	**1**	**2**	**3**	**4**	**5**
n^{th} **term**	**2**	**4**	**8**	**16**	?

Answer: The 5^{th} term is 32, because each term is multiplied by 2.

1	2	3	4	5
2	4	8	16	32

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