SEQUENCES

A NUMERICAL SEQUENCE
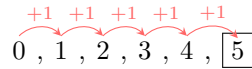
> **Definition Numerical sequence**
>
> A **numerical sequence** is a list of numbers that follow a rule. Each number in the sequence follows this rule, helping us know what the next number will be.

Ex: What do you think the next number in the sequence will be?

$$0, 1, 2, 3, 4, ?$$

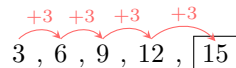*Answer:* The next number is 5, because each number increases by 1.

$$\overset{+1}{\frown}\ \overset{+1}{\frown}\ \overset{+1}{\frown}\ \overset{+1}{\frown}\ \overset{+1}{\frown}$$
$$0\ ,\ 1\ ,\ 2\ ,\ 3\ ,\ 4\ ,\ \boxed{5}$$

> **Definition Arithmetic Sequence**
>
> An **arithmetic sequence** is a list of numbers where the same number is added or subtracted each time to get the next number.

Ex: What is the next number in the sequence?
$$3, 6, 9, 12, ?$$

Answer: The next number is 15, because each number increases by 3.

$$\overset{+3}{\frown}\ \overset{+3}{\frown}\ \overset{+3}{\frown}\ \overset{+3}{\frown}$$
$$3\ ,\ 6\ ,\ 9\ ,\ 12\ ,\ \boxed{15}$$

> **Definition Geometric Sequence**
>
> A **geometric sequence** is a list of numbers where the same number is multiplied or divided each time to get the next number

Ex: What is the next number in the sequence?
$$2, 4, 8, 16, ?$$

Answer: The next number is 32, because each number is multiplied by 2.

$$\overset{\times 2}{\frown}\ \overset{\times 2}{\frown}\ \overset{\times 2}{\frown}\ \overset{\times 2}{\frown}$$
$$2\ ,\ 4\ ,\ 8\ ,\ 16\ ,\ \boxed{32}$$