

What is a Sequence?

A Sequence is a list of things (usually numbers) that are in order.

"term", "element" or "member" mean the same thing)

Infinite or Finite

When the sequence goes on forever it is called an **infinite sequence**, otherwise it is a **finite sequence**

Examples:

{1, 2, 3, 4, ...} is a very simple sequence (and it is an **infinite sequence**)

{20, 25, 30, 35, ...} is also an infinite sequence

{1, 3, 5, 7} is the sequence of the first 4 odd numbers (and is a **finite sequence**)

{4, 3, 2, 1} is 4 to 1 **backwards**

{1, 2, 4, 8, 16, 32, ...} is an infinite sequence where every term doubles

{a, b, c, d, e} is the sequence of the first 5 letters **alphabetically**

{f, r, e, d} is the sequence of letters in the name "fred"

{0, 1, 0, 1, 0, 1, ...} is the sequence of **alternating** 0s and 1s (yes they are in order, it is an alternating order in this case)

In Order

When we say the terms are "in order", we are free to define **what order that is!** They could go forwards, backwards ... or they could alternate ... or any type of order we want!

Like a Set

A Sequence is like a [Set](#), except:

- the terms are **in order** (with Sets the order does not matter)
- the same value can appear many times (only once in Sets)

Example: $\{0, 1, 0, 1, 0, 1, \dots\}$ is the **sequence** of alternating 0s and 1s.

The **set** is just $\{0, 1\}$

Notation

Sequences also use the same **notation** as sets:

list each element, separated by a comma, and then put curly brackets around the whole thing. $\{3, 5, 7, \dots\}$

The curly brackets $\{ \}$ are sometimes called "set brackets" or "braces".

A Rule

A Sequence usually has a **Rule**, which is a way to find the value of each term.

Example: the sequence $\{3, 5, 7, 9, \dots\}$ starts at 3 and jumps 2 every time: