Sequences

- A function $f : N \to R$
- Often convenient to use $f : N^+ \to R$
- Write $(a_n)_{n\geq 1}$, where $a_n = f(n)$
- We may write a_n or $a_1, a_2, a_3, \ldots$
- **Every convergent sequence in R with a limit in R is bounded**

Increasing Sequence

A sequence $(a_n)_{n\geq 1}$ is increasing if $a_{n+1} \geq a_n$ for $n \geq 1$

Decreasing Sequence

A sequence $(a_n)_{n\geq 1}$ is decreasing if $a_{n+1} \leq a_n$ for $n \geq 1$

Monotonic Sequence

A sequence is monotonic if it is either increasing or decreasing.

Strictly Increasing Sequence

A sequence $(a_n)_{n\geq 1}$ is strictly increasing if $a_{n+1} > a_n$ for $n \geq 1$

Strictly Decreasing Sequence

A sequence $(a_n)_{n\geq 1}$ is strictly decreasing if $a_{n+1} < a_n$ for $n \geq 1$