

MONOTONE REAL FUNCTIONS

Why

We can interpret a real function as tracing a path as we move from left to right in its domain.¹ We want language for whether this tracing increases or decreases the range values.

Definition

Let $A \subset \mathbf{R}$ and let $f: A \to \mathbf{R}$. A function is monotone increasing if f(x) < f(y) whenever x < y, and monotone nondecreasing if $f(x) \leq f(y)$ whenever $x, y \in \mathbf{R}$ and x < y. Similarly we define monotone decreasing and monotone nonincreasing.

¹Future editions will likely have this interpretation in a separate sheet.

²Unforunately, some authors use "monotone increasing" for "monotone nondecreasing" and use the terminolgy *strictly monotone increasing* for "monotone increasing".

