

CONVEX FUNCTIONS

Why

We speak of a function which always bends up.

Definition

A convex real-valued function is a function defined on a convex set of real numbers for which the result of the function on a convex combination of any two points in the domain is smaller than the convex combination of the same length of the value of the function on the endpoints.

Notation

Let R denote the set of real numbers. Let $A \subset R$ be a convex set. The function $f: A \to R$ is convex if, for any $a, b \in A$ and $t \in [0, 1]$,

$$f(ta + (1-t)b) \le tf(a) + (1-t)f(b).$$

