definition: absolute extrema

absolute maximum

absolute minimum

the extreme value theorem

definition: absolute extrema

Let $f(x)$ be a function defined on interval I and let $a \in I$

- We say $f(x)$ has an absolute maximum at $x = a$ if $f(a)$ is the maximal value of $f(x)$ on I:

$$f(a) \geq f(x) \text{ for all } x \in I$$

- We say $f(x)$ has an absolute minimum at $x = a$ if $f(a)$ is the minimal value of $f(x)$ on I:

$$f(a) \leq f(x) \text{ for all } x \in I$$

the extreme value theorem

If f is continuous on a closed interval $[a, b]$ then f has both a minimum and a maximum

definition: local extrema