oscillation of a function

Canonical name	OscillationOfAFunction
Date of creation	2013-03-22 17:45:50
Last modified on	2013-03-22 17:45:50
Owner	perucho (2192)
Last modified by	perucho (2192)
Numerical id	5
Author	perucho (2192)
Entry type	Definition
Classification	msc 26A06
Related topic	TotalVariation

Definition 1. *Let* $f : X \subset \mathbb{R} \to \mathbb{R}$. *The* **oscillation** *of the function* f *on the set* X *is said to be*

$$\omega(f, X) = \sup_{a,b \in X} |f(b) - f(a)|,$$

where a, b *are arbitrary points in* X.

0.1 Examples

- $\omega(x^2, [-1, 2]) = 4$

- $\omega(x, [-1, 2]) = 3$

- $\omega(x, (-1, 2)) = 3$

- $\omega(\operatorname{sgn} x [-1, 2]) = 2$

- $\omega(\operatorname{sgn} x [0, 2]) = 1$

- $\omega(\operatorname{sgn} x (0, 2]) = 0$

Cauchy's criterion can be expressed in terms of this concept.[?]

References

[1] V., Zorich, *Mathematical Analysis I*, pp. 131, First Ed., Springer-Verlag, 2004.