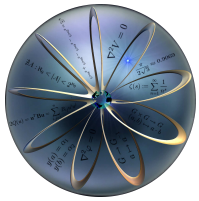

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homogeneous function

Canonical name	HomogeneousFunction
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Synonym	homogeneous function of degree
Synonym	positively homogeneous function
Related topic	HomogeneousPolynomial
Related topic	SubLinear

Definition 1. *Suppose V, W are a vector spaces over $\mathbb{R}$, and $f\colon V \to W$ is a mapping.*

- *If there exists an $r \in \mathbb{R}$, such that*

$$f(\lambda v) = \lambda^r f(v)$$

for all $\lambda \in \mathbb{R}$ and $v \in V$, then f is a .

- *If there exists an $r \in \mathbb{R}$, such that*

$$f(\lambda v) = |\lambda|^r f(v)$$

for all $\lambda \in \mathbb{R}$ and $v \in V$, then f is .

- *If there exists an $r \in \mathbb{R}$, such that*

$$f(\lambda v) = \lambda^r f(v)$$

for all $\lambda \geq 0$ and $v \in V$, then f is a .

Notes

For any homogeneous function as above, $f(0) = 0$.

When the of homegeneity is clear one simply talks about r-homogeneous functions.