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CAUCHY-RASSIAS STABILITY OF CAUCHY-JENSEN ADDITIVE MAPPINGS IN BANACH SPACES

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摘要

关键词 Cauchy additive mapping   Jensen additive mapping   Cauchy--Rassias stability   isomorphism between Banach algebra

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Abstract Let X, Y be vector spaces. It is shown that if a mapping $f : X \rightarrow Y$ satisfies
$$\begin{aligned} &f\bigg(\frac{x+y}{2}+z\bigg) + f\bigg(\frac{x-y}{2}+z\bigg) = f(x)+2f(z) , \tag{0.1} \\ &f\bigg(\frac{x+y}{2}+z\bigg) - f\bigg(\frac{x-y}{2}+z\bigg) = f(y) , \tag{0.2}\end{aligned}$$
or
$$2f\bigg(\frac{x+y}{2}+z\bigg) = f(x)+f(y)+2f(z) \tag{0.3}$$
for all $x, y, z\in X$, then the mapping $f : X \rightarrow Y$ is Cauchy additive. Furthermore, we prove the Cauchy--Rassias stability of the functional equations $\mathrm{(0.1)}$, $\mathrm{(0.2)}$ and $\mathrm{(0.3)}$ in Banach spaces. The results are applied to investigate isomorphisms between unital Banach algebras.

Key words Cauchy additive mapping   Jensen additive mapping   Cauchy--Rassias stability isomorphism morphism between Banach algebra

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