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## 论广泛平均值和双变量同构凸函数

Theory of Extensive Average and Dual-Variable-Isomorphic Convex Function

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**摘要：**本文将凸函数、几何凸函数、平方凸函数等理论统一为双变量同构凸函数理论，给出了其统一的微分判别法则（定理6）及其满足的相应的詹森型不等式（定理8），引入了平面双同构坐标系来解释其几何意义，并把双变量同构凸函数推广到高维的情形。本文还给出了不同类型的广泛平均值间不等关系的两套判定法则，并讨论了函数的四类广泛平均值。

**关键词：**加权广泛平均值、平面双同构直角坐标系、双变量同构凸函数、n维全变量同构凸函数、函数的广泛平均值

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**Abstract :** In this paper, Some common types of Average are unified into Weighted Extensive Average, whereby the Dual-Variable-Isomorphic(DVI) Convex Function is defined to unify the theories of Convex Function, Geometrical Convex Function, Square Convex Functions, Harmonic Convex Functions, etc. The corresponding Jensen-type inequality for the DVI-Convex Function and the law of differential discrimination of DVI-Convex Function are put forward. A special type of coordinate system: Planar Dual-Axis-Isomorphic Rectangular Coordinate System is incorporated to elucidate the geometrical meaning of the DVI-Convex Function. The DVI-Convex function is then generalized to a multi-dimensional category. The relationships among DVI-Convex Function and a special type function: DVI Function and Extensive Average are explored, whereby two sets of laws for discrimination of inequations between different types of Extensive Average are put forth. Also discussed are four types of Extensive Average of Function derived from DVI function.

**Keywords :** Weighted Extensive Average, Planar Dual-Axis-Isomorphic Rectangular Coordinate System, Dual-Variable-Isomorphic Convex (DVI-Convex) Function, n-D All-Variable-Isomorphic Convex Function, Extensive Average of Function

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