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An elementary proof of the Knight-Meyer characterization of the Cauchy distribution. (English) Zbl 0655.62007

J. Multivariate Anal. 22, 74-78 (1987).

This paper propounds a short proof of a result previously proved by *F. Knight* and *P. A. Meyer* [Z. Wahrscheinlichkeitstheorie verw. Gebiete 34, 129-134 (1976; Zbl 0353.60020)]. Let X be a random variable in $\mathbb{R}^n$ with the following property: for any matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix}$ in $GL(n+1)$ (where a is an (n,n) matrix) there exist α in GL(n) and β in $\mathbb{R}^n$ so that $(aX+b)/(cX+d)$ and $(\alpha X+\beta)$ have the same distribution. Then X is necessarily Cauchy distributed.

MSC:

62E10 Characterization and structure theory of statistical distributions
60E05 Probability distributions: general theory

Keywords:

Cauchy distribution; characterization; type; projective space; GL(n)

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References:

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