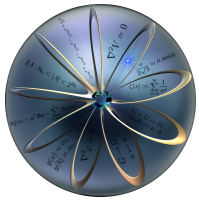

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extension of valuation from complete base field

Canonical name	ExtensionOfValuationFromCompleteBaseField
Date of creation	2013-03-22 15:01:01
Last modified on	2013-03-22 15:01:01
Owner	pahio (2872)
Last modified by	pahio (2872)
Numerical id	9
Author	pahio (2872)
Entry type	Theorem
Classification	msc 13F30
Classification	msc 13A18
Classification	msc 12J20
Classification	msc 11R99
Related topic	CompleteUltrametricField
Related topic	ValueGroupOfCompletion
Related topic	NthRoot

Here the valuations are of rank one, and it may be supposed that the values are real numbers.

- Assume a finite field extension K/k and a valuation of K. If the base field is `http://planetmath.org/Complete`complete with regard to this valuation, so is also the extension field.

- If K/k is an algebraic field extension and if the base field k is `http://planetmath.org/Comple` with regard to its valuation $|\cdot|$, then this valuation has one and only one extension to the field K. This extension is determined by

$$|\alpha| = \sqrt[n]{|N(\alpha)|} \quad (\alpha \in K),$$

  where $N(\alpha)$ is the norm of the element α in the simple field extension $k(\alpha)/k$ and n is the degree of this field extension.

These theorems concern also Archimedean valuations.