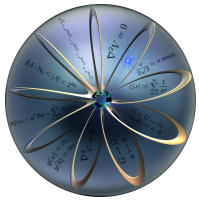

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discrete valuation ring

Canonical name	DiscreteValuationRing
Date of creation	2013-03-22 12:16:40
Last modified on	2013-03-22 12:16:40
Owner	djao (24)
Last modified by	djao (24)
Numerical id	9
Author	djao (24)
Entry type	Definition
Classification	msc 13F30
Classification	msc 13H10
Synonym	DVR
Related topic	LocalRing
Related topic	DiscreteValuation
Related topic	Valuation
Defines	uniformizer
Defines	uniformizing element
Defines	order

A *discrete valuation ring* R is a principal ideal domain with exactly one **nonzero** maximal ideal M. Any generator t of M is called a *uniformizer* or *uniformizing element* of R; in other words, a uniformizer of R is an element $t \in R$ such that $t \in M$ but $t \notin M^2$.

Given a discrete valuation ring R and a uniformizer $t \in R$, every element $z \in R$ can be written uniquely in the form $u \cdot t^n$ for some unit $u \in R$ and some nonnegative integer $n \in \mathbb{Z}$. The integer n is called the *order* of z, and its value is independent of the choice of uniformizing element $t \in R$.