



Math for the people, by the people.

## ultrametric space

Canonical name	UltrametricSpace
Date of creation	2013-03-22 14:55:28
Last modified on	2013-03-22 14:55:28
Owner	pahio (2872)
Last modified by	pahio (2872)
Numerical id	6
Author	pahio (2872)
Entry type	Definition
Classification	msc 54E35
Related topic	UltrametricTriangleInequality
Related topic	Ultrametric

The metric space  $(X, d)$  is called an *ultrametric space*, if its metric  $d$  is an ultrametric, i.e. if

$$d(x, z) \leq \max\{d(x, y), d(y, z)\} \quad \forall x, y, z \in X.$$

**Example.** The field  $\mathbb{Q}$  together with any of its  $p$ -adic metrics

$$d_p(x, y) = |x - y|_p,$$

where  $|\cdot|_p$  is the <http://planetmath.org/PAdicValuation>  $p$ -adic valuation of  $\mathbb{Q}$ , forms an ultrametric space.