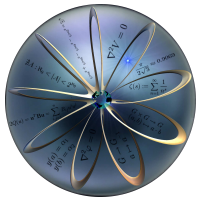

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domain

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A http://planetmath.org/node/4811connected non-empty open set in $\mathbb{C}^n$ is called a *domain*.

The topology considered is the Euclidean one (viewing $\mathbb{C}$ as $\mathbb{R}^2$). So we have that for a domain D being connected is equivalent to being path-connected.

Since we have that every component of a region D will be a domain, we have that every region has at most countably many components.

This definition has no particular relationship to the notion of an http://planetmath.org/Integ domain, used in algebra. In number theory, one sometimes talks about fundamental domains in the upper half-plane, these have a different definition and are not normally open. In set theory, one often talks about the http://planetmath.org/Functiondomain of a function. This is a separate concept. However, when one is interested in complex analysis, it is often reasonable to consider only functions defined on connected open sets in $\mathbb{C}^n$, which we have called domains in this entry. In this context, the two notions coincide.

A *domain* in a metric space (or more generally in a topological space) is a connected open set.

Cf. http://mathworld.wolfram.com/Domain.htmlMathworld, http://en.wikipedia.org/wi