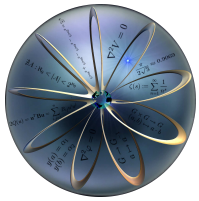

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## separable space

| | |
|---|---|
| Canonical name | SeparableSpace |
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| Related topic | SecondCountable |
| Related topic | Lindelof |
| Related topic | EverySecondCountableSpaceIsSeparable |
| Related topic | HewittMarczewskiPondiczeryTheorem |
| Defines | separable |

# Definition

A topological space is said to be *separable* if it has a countable dense subset.

# Properties

All second-countable spaces are separable. A metric space is separable if and only if it is second-countable.

A continuous image of a separable space is separable.

An open subset of a separable space is separable (in the subspace topology).

A `http://planetmath.org/ProductTopology`product of $2^{\aleph_0}$ or fewer separable spaces is separable. This is a special case of the Hewitt-Marczewski-Pondiczery Theorem.

A Hilbert space is separable if and only if it has a countable orthonormal basis.