Dedekind-infinite

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Defines	Dedekind-finite
Defines	Dedekind finite

A set A is said to be *Dedekind-infinite* if there is an injective function $f \colon \omega \to A$, where ω denotes the set of natural numbers. A set that is not Dedekind-infinite is said to be *Dedekind-finite*.

A Dedekind-infinite set is clearly infinite, and in ZFC it can be shown that a set is Dedekind-infinite if and only if it is infinite.

It is consistent with ZF that there is an infinite set that is not Dedekind-infinite. However, the existence of such a set requires the failure not just of the full Axiom of Choice, but even of the Axiom of Countable Choice.