limit point

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Related topic	AlternateStatementOfBolzanoWeierstrassTheorem

Let X be a topological space, and let $A \subseteq X$. An element $x \in X$ is said to be a *limit point* of A if every open set containing x also contains at least one point of A distinct from x. Note that we can often take a nested sequence of open such sets, and can thereby construct a sequence of points which converge to x, partially motivating the terminology "limit" in this case.

Equivalently:

- x is a limit point of A if and only if there is a net in A converging to x which is not residually constant.

- x is a limit point of A if and only if there is a filter on A http://planetmath.org/filterconve to x.

- If X is a metric (or first countable) space, x is a limit point of A if and only if there is a sequence of points in $A \setminus \{x\}$ converging to x.