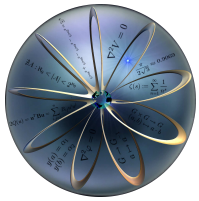

planetmath.org

Math for the people, by the people.

closure

Canonical name	Closure
Date of creation	2013-03-22 12:05:40
Last modified on	2013-03-22 12:05:40
Owner	mathwizard (128)
Last modified by	mathwizard (128)
Numerical id	9
Author	mathwizard (128)
Entry type	Definition
Classification	msc 54A99
Related topic	ClosureAxioms
Related topic	Interior

The *closure* $\overline{A}$ of a subset A of a topological space X is the intersection of all closed sets containing A.

Equivalently, $\overline{A}$ consists of A together with all limit points of A in X or equivalently $x \in \overline{A}$ if and only if every neighborhood of x intersects A. Sometimes the notation $\mathrm{cl}(A)$ is used.

If it is not clear, which topological space is used, one writes $\overline{A}^X$. Note that if Y is a subspace of X, then $\overline{A}^X$ may not be the same as $\overline{A}^Y$. For example, if $X = \mathbb{R}$, $Y = (0,1)$ and $A = (0,1)$, then $\overline{A}^X = [0,1]$ while $\overline{A}^Y = (0,1)$.