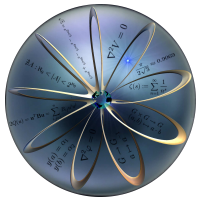

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cell attachment

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Synonym	cell adjunction
Related topic	CWComplex
Defines	cell
Defines	open cell
Defines	closed cell
Defines	attaching map

Let X be a topological space, and let Y be the adjunction $Y := X \cup_\varphi D^k$, where D^k is a closed `http://planetmath.org/StandardNBall`k-ball and $\varphi\colon S^{k-1} \to X$ is a continuous map, with S^{k-1} is the $(k-1)$-sphere considered as the boundary of D^k. Then, we say that Y is obtained from X by the *attachment of a k-cell,* by the *attaching map* φ. The image e^k of D^k in Y is called a *closed k-cell*, and the image $\overset{\circ}{e}{}^k$ of the interior

$$D^\circ := D^k \setminus S^{k-1}$$

of D^k is the corresponding *open k-cell*.

Note that for $k = 0$ the above definition reduces to the statement that Y is the disjoint union of X with a one-point space.

More generally, we say that Y is obtained from X by *cell attachment* if Y is homeomorphic to an adjunction $X \cup_{\{\varphi_i\}} D^{k_i}$, where the maps $\{\varphi_i\}$ into X are defined on the boundary spheres of closed balls $\left\{D^{k_i}\right\}$.