Facet (geometry)

In geometry, a **facet** is a feature of a polyhedron, polytope, or related geometric structure, generally of dimension one less than the structure itself.

- In three-dimensional geometry a **facet** of a polyhedron is any polygon whose corners are vertices of the polyhedron, and is not a face.[1][2]To **facet** a polyhedron is to find and join such facets to form the faces of a new polyhedron; this is the reciprocal process to stellation and may also be applied to higher-dimensional polytopes.[3]
- In polyhedral combinatorics and in the general theory of polytopes, a **facet** of a polytope of dimension n is a face that has dimension $n - 1$. Facets may also be called $(n - 1)$-faces. In three-dimensional geometry, they are often called "faces" without qualification.[4]
- A **facet** of a simplicial complex is a maximal simplex, that is a simplex that is not a face of another simplex of the complex.[5] For simplicial polytopes this coincides with the meaning from polyhedral combinatorics.

References

1. Bridge, N.J. Facetting the dodecahedron, *Acta crystallographica* **A30** (1974), pp. 548–552.
2. Inchbald, G. Facetting diagrams, *The mathematical gazette*, **90** (2006), pp. 253–261.
3. Coxeter, H. S. M. (1973), *Regular Polytopes*, Dover, p. 95.
4. Matoušek, Jiří (2002), *Lectures in Discrete Geometry*, Graduate Texts in Mathematics **212**, Springer, 5.3 Faces of a Convex Polytope, p. 86.
5. De Loera, Jesús A.; Rambau, Jörg; Santos, Francisco (2010), *Triangulations: Structures for Algorithms and Applications*, Algorithms and Computation in Mathematics **25**, Springer, p. 493, ISBN 9783642129711.

External links

- Weisstein, Eric W., "Facet" (http://mathworld.wolfram.com/Facet.html), *MathWorld*.
- Olshevsky, George, *Facet (http://web.archive.org/web/20070204075028/members.aol.com/Polycell/glossary.html#Facet)* at *Glossary for Hyperspace*.

Categories: Polyhedra | Polyhedral combinatorics | Polychora | Polytopes