

Polytope

URL,

February 2021

1 Introduction

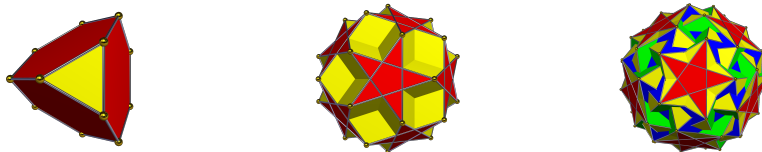
Welcome to the [Polytope Discord!](#) Here we discuss **polytopes**, which is a general term that encompasses polygons (2D), polyhedra (3D), polychora (4D), and so on for any dimension.

2 Regular polytopes

There are multiple definitions for when a polytope is **regular**, but they all require every element (vertices, edges, faces, etc.) to “look the same.”

3 Uniform polytopes

Intuitively, a polytope is **uniform** when all of its facets are regular and all of its vertices “look the same.” To see what we mean, let’s look at a few examples.

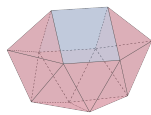


(a) Truncated tetrahedron (b) Dodecadodecahedron (c) Snub icosidodecahedron

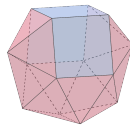
Figure 1: Three examples of uniform polytopes.

4 CRF polytopes

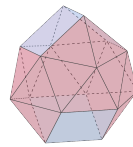
A polytope is called **convex regular-faced**, or **CRF** for short, when it is convex (without dents, holes or self-intersections) and all of its faces are regular. Let’s look at a few examples.



(a) Sphenomegacorona



(b) Hebesphenomegacorona



(c) Disphenocingulum

Figure 2: Test images!