



In geometry, a deltahedron is a polyhedron whose faces are all equilateral triangles.

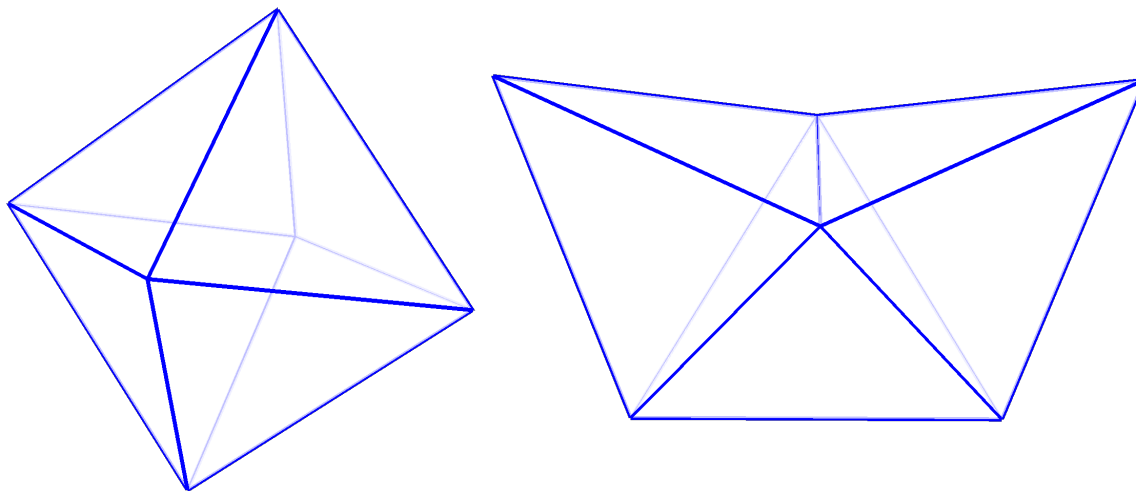


Figure 1: The two deltahedra consisting of eight triangles: the octahedron and the biaugmented tetrahedron.

Question. How many polytopes can you make out of n equilateral triangles?

Related.

1. What if none of the adjacent faces can be coplanar? (e.g. the “scaled-up” tetrahedron is not allowed)
2. How many with some sort of symmetry?
3. What if squares or pentagons are used instead?
4. What if pentagons and triangles are used?
5. How does this generalize to higher dimensions?
6. Which n -cell nets can produce the greatest number of distinct polytopes?
7. How many n -cell nets can form at least one polytope?
8. There is one augmented tetrahedron, one bi-augmented tetrahedron, and three tri-augmented tetrahedra. How many k -augmented tetrahedra?

References.

<https://en.wikipedia.org/wiki/Deltahedron>

Note.

The tetrahedron is the only deltahedron with 4 faces.

The triangular bipyramid is the only deltahedron with 6 faces.

There are at least five examples of deltahedra with 10 faces: the pentagonal dipyramid, the augmented octahedron, and the three ways to augment the biaugmented tetrahedron.