Regular Polyhedra

MATH 261 Computational Geometry

1. What regular polyhedra are possible with each of the following types of faces?

Hint: How many of each face could possibly meet at each vertex?

(a) Triangles

(b) Squares

(c) Pentagons

(d) n-gons for $n \geq 6$

2. Suppose you relax the definition of regular polyhedra to allow *different* numbers of faces to meet at each vertex. What new polyhedra will now be possible?

3. Suppose you relax the definition of regular polyhedra to allow nonconvex polyhedra. What polyhedra will result?

Semi-Regular Polyhedra

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4. What semi-regular polyhedra can be obtained by truncating the corners of...

(a) a tetrahedron?

(b) a cube?

(c) an octahedron?

(d) a dodecahedron?

(e) an icosahedron?

Does it matter *how much* you truncate the corners in each case?

5. What prisms are semi-regular polyhedra?

6. Can you think of any other semi-regular polyhedra?