

## Intersecting Planes



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### Summary

Three objects, made by intersecting regular polygons in the most regular way.



4.63 hrs



3 pcs



0.20 mm



0.40 mm



PLA



44 g



Prusa MINI /  
MINI+

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Tags: [dual](#) [planes](#) [regularpolygons](#) [octahedron](#) [dihedral](#)  
[cuboctahedron](#) [icosidodecahedron](#) [greatcircle](#)

These three objects, made by intersecting regular polygons, correspond to the three polyhedrons that result from intersecting each Platonic solid with its dual:

- Tetrahedron  $\cap$  Tetrahedron = Octahedron
- Cube  $\cap$  Octahedron = Cuboctahedron
- Dodecahedron  $\cap$  Icosahedron = Icosidodecahedron

The edges of the Octahedron, the Cuboctahedron and the Icosidodecahedron can be grouped in “great circles” (regular polygons, indeed):

- Octahedron = 3 squares
- Cuboctahedron = 4 hexagons
- Icosidodecahedron = 6 decagons

I wanted to highlight this fact by showing just these regular polygons because this is the most regular way to intersect 3, 4 or 6 planes that share a single point.

I provide the parametric OpenScad files for each object (including a “rounded regular polygon” module) and print files that are scaled so all edges have the same length (2 cm).

The only tricky print is the Icosidodecahedron, because it requires supports for the horizontal plane. The other two files can be printed without supports in the given orientation of the STL files.

## Model files



### **threesquares.stl**

☐ Skeletal Octahedron



### **fourhexagons.stl**

☐ Skeletal Cuboctahedron



### **sixdecagons.stl**

☐ Skeletal Icosidodecahedron



### **threesquares.scad**

☐ Skeletal Octahedron



### **fourhexagons.scad**

☐ Skeletal Cuboctahedron









## sixdecagons.scad

 Skeletal Icosidodecahedron

## Print files









### threesquares\_02mm\_pla\_mini\_15m.gcode

 PLA  0.40 mm  0.20 mm  0.25 hrs  1 g  Prusa MINI / MINI+









### fourhexagons\_02mm\_pla\_mini\_42m.gcode

 PLA  0.40 mm  0.20 mm  0.70 hrs  6 g  Prusa MINI / MINI+



### sixdecagons\_02mm\_pla\_mini\_3h41m.gcode






 PLA  0.40 mm  0.20 mm  3.68 hrs  37 g  Prusa MINI / MINI+

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