Convex Segmentochora

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Abstract

Polytopes with all vertices both (A) on a (hyper-) sphere and (B) on a pair of parallel (hyper-) planes, and further (C) with all edges of equal length l will call segmentotopes. Moreover, in dimensions 2, 3 and 4 names like segmento*gon*, segmento*hedron*, and segmento*choron* could be used. In this article the *convex* segmentotopes up to dimension 4 are listed.

1 Introduction

About 150 years of highdimensional research on polytopes have passed. The regular ones are well-known since those days: in 1852 L. Schlaefli completed his monograph on polyschemes. About 20 years after N. Johnson in 1966 had published the set of convex polyhedra with regular faces, Mrs. R. Blind had done the corresponding research in higher dimensions for polytopes with regular facets. The convex uniform ones of dimension 4 are readily listed on the webpages http://member.aol.com/_ht_b/Polycell/uniform.html, and the complete list of all uniform ones of dimension 4 is still ongoing (J. Bowers and G. Olshevsky).

Sure, polychora, i.e. polytopes of dimension 4, are not so easy to visualize. This is especially due to the fact that for this attempt the 4th dimension has to be projected somehow into the span of the other 3 directions. One possibility, to do this, works rather well for figures with just one edge length. It shows the 4th dimension as a contraction. In this projection especially monostratic figures, i.e. figures with just one layer with respect to (at least) one direction, are easily illustrated by 2 concentric polyhedra, standing for the bottom and the top of the layer. The space inbetween will then be filled accordingly to the projection of the latteral cells.

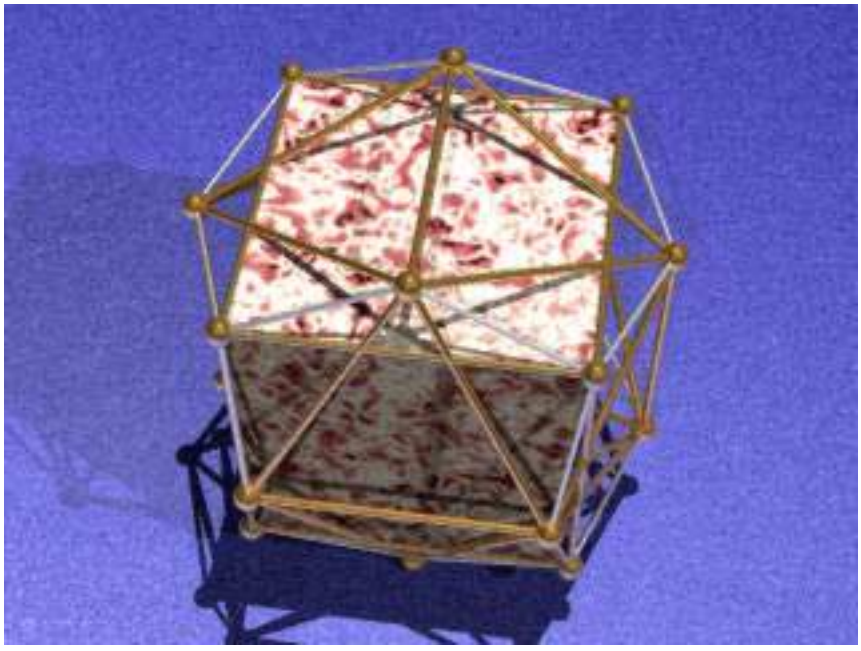

Figure 1: icosahedron atop cube

Figure 1 shows an example of such a projection of a segmentochoron. The 2 parallel polyhedra are a cube (solid) respectively an icosahedron (frame). Those edges of the latter which are parallel to the cube are joined to the faces of the cube by trigonal prisms. The vertices of the cube are joined to 8 of the icosahedral faces by tetrahedra. The remaining 12 icosahedral faces are joined to the still open squares of the trigonal prisms by square pyramids. Thus the cell count of that segmentochoron is: 8 tetrahedra + 12 square pyramids + 6 trigonal prisms + 1 cube + 1 icosahedron. In this Figure the arbitrary relative scaling was chosen such that the edges of cube and icosahedron do intersect in this projection. - Figure 1 was produced by Robert J. MacG. Dawson (robert.dawson@stmarys.ca).

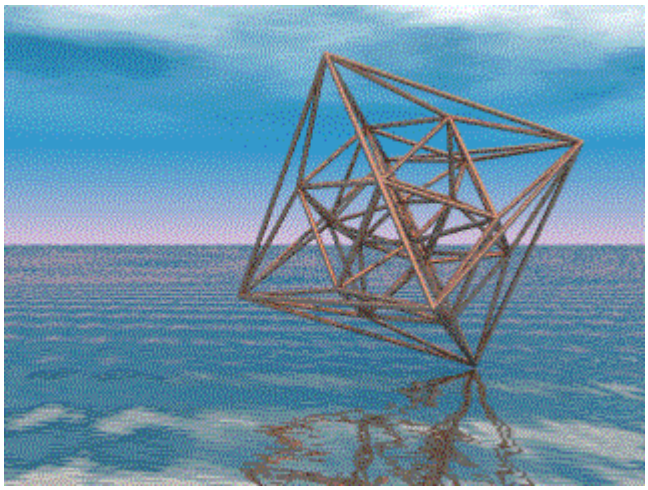

Figure 2: bistratic projection of an icositetrachoron: octahedron atop (pseudo) cuboctahedron atop octahedron

Figure 2 was found on http://www.math.tu-berlin.de/diskregeom/polymake/doc/polytope.gif. It shows the skelleton of the regular icositetrachoron. In this bistratic projection it is visible as octahedron atop (pseudo) cuboctahedron atop octahedron. The equatorial cuboctahedron is marked as pseudo, as it is not a facet of the icositetrachoron; just as the equatorial square is not a face of the octahedron, which alike could be called 'point atop (pseudo) square atop point'. Nevertheless, both the inner and the outer half of the bistratic projected icositetrachoron are projections of valid segmentochora, which are monostratic. Then square faces of the cuboctahedron are joined to the vertices of the parallel octahedra by square pyramids (halves of octahedra) and the trigons of the cuboctahedron to the faces of the parallel octahedra by trigonal antiprisms (i.e. octahedra). Thus those segmentochora consist of 1+8 octahedra + 6 square pyramids + 1 cuboctahedron.

Polychora which are monostratic are the topic of this article. Especially we look at *convex segmentochora*. In general segmentotopes are defined to be polytopes (thereby following all implications thereof) and additionally have

- all vertices on a single hypersphere,
- all vertices on a (not necessarily unique) pair of parallel hyperplanes,
- all edges of unit length.

The first condition shows that the circumradius is well defined. Moreover, in union with condition 3 this implies that all faces have to be regular. Condition 2 implies that all edges, which don't lye completely within one of the hyperplanes, will join both, i.e. having one vertex each in either plane. Thence segmentotopes have to be monostratic. We restrict ourselves to *convex* segmentotopes, as their count grows rather fast with the dimension.

From this definition it follows that the top and bottom figures too are polytopes with all vertices on a single circumsphere. Thus, for convex segmentochora we have as possible top and bottom figures the following set:

Top or bottom figure	Circumradius
Point	0 (shear?)
Line	1/2 (shear?)
Trigon	1/sqrt(3) = 0.577350 (shear?)
Square	1/sqrt(2) = 0.707107 (shear?)
Pentagon	sqrt((5+sqrt(5))/10) = 0.850651 (shear?)
Hexagon	1 (shear?)
Octagon	sqrt(1+1/sqrt(2)) = 1.306563 (shear?)
Decagon	(1+sqrt(5))/2 = 1.618034 (shear?)
N-gon: N>6,not 8,10	1/(2*sin(pi/n)) (shear?)
Tetrahedron	sqrt(3/8) = 0.612372
Octahedron	1/sqrt(2) = 0.707107
Cube	sqrt(3/4) = 0.866025
Icosahedron	sqrt((5+sqrt(5))/8) = 0.951057
Dodecahedron	sqrt((9+3*sqrt(5))/8) = 1.401259
Cuboctahedron	1
Icosidodecahedron	(1+sqrt(5))/2 = 1.618034
Truncated tetrahedron	sqrt(11/8) = 1.172604
Truncated octahedron	sqrt(5/2) = 1.581139
Truncated cube	sqrt(7+4*sqrt(2))/2 = 1.778824
Truncated icosahedron	sqrt((29+9*sqrt(5))/8) = 2.478019
Truncated dodecahedron	sqrt((37+15*sqrt(5))/8) = 2.969445
Rhombicuboctahedron	sqrt((5+sqrt(8))/4) = 1.398966
Rhombicosidodecahedron	sqrt(sqrt(5)+11/4) = 2.232951
Truncated cuboctahedron	sqrt(13+6*sqrt(2))/2 = 2.317611
Truncated icosidodecahedron	sqrt(31+12*sqrt(5))/2 = 3.802394
Snub cuboctahedron	sqrt((1-cos^2(x))/(3-4*cos^2(x))) = 1.343713 [cos(x) = (cbrt(1+sqrt(11/27))+cbrt(1-sqrt(11/27)))/cbrt(sqrt(128)) = 0.842509]
Snub icosidodecahedron	sqrt((1-cos^2(x))/(3-4*cos^2(x))) = 2.155837 [cos(x) = (cbrt(9+9*sqrt(5)+sqrt(102 +162*sqrt(5)))+cbrt(9+9*sqrt(5)-sqrt(102 +162*sqrt(5))))/cbrt(288) = 0.857781]
4-Pyramid (J1)	1/sqrt(2) = 0.707107
5-Pyramid (J2)	sqrt((5+sqrt(5))/8) = 0.951057
3-Cupola (J3)	1
4-Cupola (J4)	sqrt((5+sqrt(8))/4) = 1.398966
5-Cupola (J5)	sqrt(sqrt(5)+11/4) = 2.232951
Rotunda (J6)	(1+sqrt(5))/2 = 1.618034
Gyroelongated 5-pyramid (J11)	sqrt((5+sqrt(5))/8) = 0.951057
Elongated 4-cupola (J19)	sqrt((5+sqrt(8))/4) = 1.398966
Trigonal orthobicupola (J27)	1
Orthobirotunda (J34)	(1+sqrt(5))/2 = 1.618034
Gyrated rhombicuboctahedron (J37)	sqrt((5+sqrt(8))/4) = 1.398966
Metabidiminished icosahedron (J62)	sqrt((5+sqrt(5))/8) = 0.951057
Tridiminished icosahedron (J63)	sqrt((5+sqrt(5))/8) = 0.951057
Gyrated rhombicosidodecahedron (J72)	sqrt(sqrt(5)+11/4) = 2.232951
Parabigyrated rhombicosidodecahedron (J73)	sqrt(sqrt(5)+11/4) = 2.232951
Metabigyrated rhombicosidodecahedron (J74)	sqrt(sqrt(5)+11/4) = 2.232951
Trigyrated rhombicosidodecahedron (J75)	sqrt(sqrt(5)+11/4) = 2.232951
Diminished rhombicosidodecahedron (J76)	sqrt(sqrt(5)+11/4) = 2.232951
Diminished paragyrated rhombicosidodecahedron (J77)	sqrt(sqrt(5)+11/4) = 2.232951
Diminished metagyrated rhombicosidodecahedron (J78)	sqrt(sqrt(5)+11/4) = 2.232951
Diminished bigyrated rhombicosidodecahedron (J79)	sqrt(sqrt(5)+11/4) = 2.232951
Parabidiminished rhombicosidodecahedron (J80)	sqrt(sqrt(5)+11/4) = 2.232951
Metabidiminished rhombicosidodecahedron (J81)	sqrt(sqrt(5)+11/4) = 2.232951
Metabidiminished gyrated rhombicosidodecahedron (J82)	sqrt(sqrt(5)+11/4) = 2.232951
Tridiminished rhombicosidodecahedron (J83)	sqrt(sqrt(5)+11/4) = 2.232951
3-Prism	sqrt(7/12) = 0.763763
5-Prism	sqrt(15+2*sqrt(5))/20) = 0.986715
6-Prism	sqrt(5)/2 = 1.118034

Top or bottom figure	Circumradius
8-Prism	sqrt((5+sqrt(8))/4) = 1.398966
10-Prism	sqrt((7+2*sqrt(5))/4) = 1.693527
N-Prism: N>6, not 8, 10	sqrt(1+csc^2(pi/n))/2
4-Antiprism	sqrt((4+sqrt(2))/8) = 0.822664
5-Antiprism	sqrt((5+sqrt(5))/8) = 0.951057
6-Antiprism	sqrt((3+sqrt(3))/4) = 1.087664
8-Antiprism	sqrt((3-sqrt(2+sqrt(2)))/(8-4*sqrt(2+sqrt(2)))) = 1.375549
10-Antiprism	sqrt((3*sqrt(2)-sqrt(5+sqrt(5)))/(8*sqrt(2)-4*sqrt(5+sqrt(5)))) = 1.674505
N-Antiprism: N>6, not 8, 10	sqrt((3–2*cos(pi/n))/(8–8*cos(pi/n)))

Table 1: list of possible top and bottom facets and their circumradii

Further it follows from the definition that the latterals have to be segmentotopes in turn. So, in order to give a list of all segmentochora one has to look first at the possibilities for segmentogons and segmentohedra. In the convex cases we have (arrow means ‘atop’):

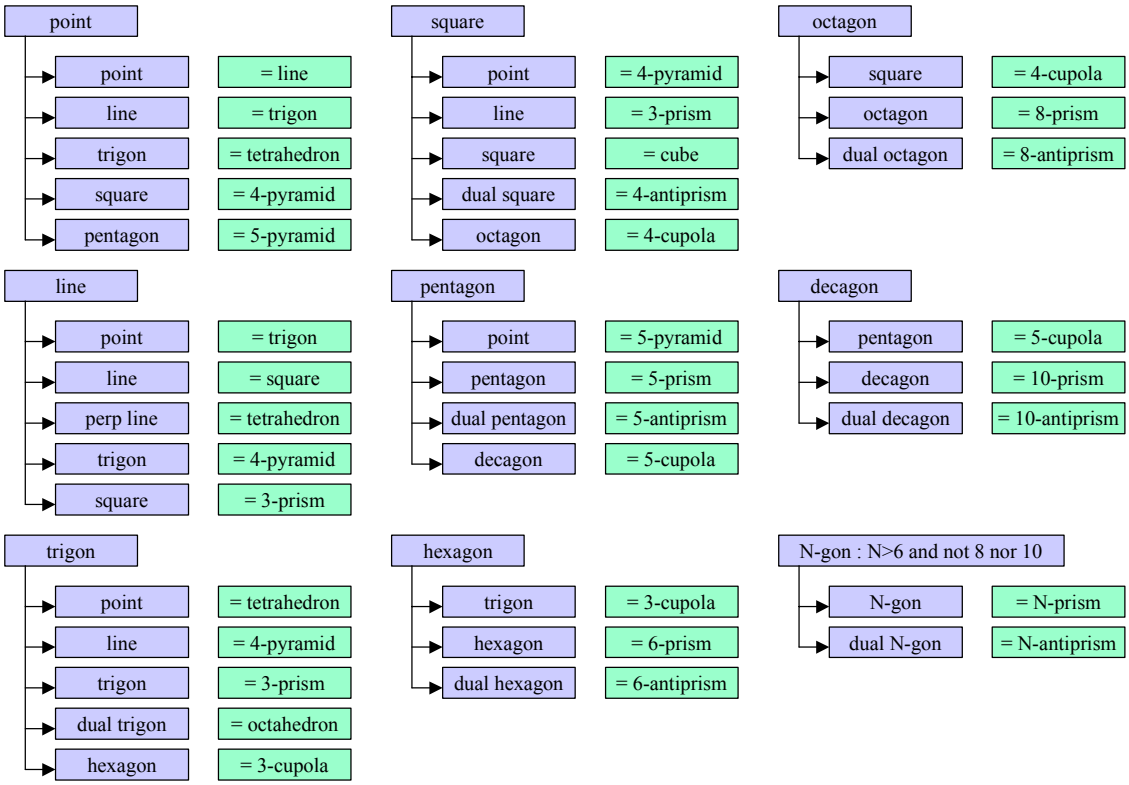

Figure 3: low-dimensional convex segmentotopes: x atop y

Maybe some first intuitive examples are in place. The first set of segmentochora clearly is that of 4D prisms. Take any polyhedron from Table 1, errect on its faces ordinary 3D prisms, bend it into the fourth dimension such that the latteral squares will meet, and close that figure with a second copy of the starting polyhedron: "x || x".

A second set of likewise trivial segmentochora is that of 4D pyramids. Take any polyhedron from Table 1 which has a circumradius < 1, put an additional vertex along the fourth

dimension atop it such that all polyhedral vertices are one unit apart: "point || x". The lateral facets are 3D pyramids ontop of the faces of the bottom polyhedron x.

More interesting segmentochora are constructable from the pyramidal subgroups of symmetry groups [[n,m,2]]. For convexity take (n,m) = (3,3), (3,4) or (3,5) (but table 2 applies to (5/2,3) and (5/2,5) too). Take 2 convex uniform polyhedra of some group [[n,m]], place them symmetrically atop another, and, if their circumradii do not differ too much, the result will be a valid segmentochoron again. - The margin of Table 2 gives the top and bottom polyhedra of the segmentochora in truncation-notation of Coxeter-Schlaefli symbols (numbers behind the 't' are positions of ringed knots in the Coxeter-Dynkin diagram). The body lists the additional, i.e. lateral facets.

	t0{n,m}	t1{n,m}	t2{n,m}	t01{n,m}	t02{n,m}	t12{n,m}	t012{n,m}
t0{n,m}	n-p	n-ap, m-pyr	n-pyr, tet, m-pyr	n-cup, m-pyr	n-p, 3p, m-pyr	n-ap, tet, 2m-pyr	n-cup, 3p, 2m-pyr
t1{n,m}		n-p, m-p	n-pyr, m-ap	n-cup, m-p	n-ap, 4pyr, m-ap	n-p, m-cup	n-cup, 4pyr, m-cup
t2{n,m}			m-p	2n-pyr, tet, m-ap	n-pyr, 3p, m-p	n-pyr, m-cup	2n-pyr, 3p, m-cup
t01{n,m}				2n-p, m-p	n-cup, 3p, m-ap	n-cup, tet, m-cup	2n-p, 3p, m-cup
t02{n,m}					n-p, cube, m-p	n-ap, 3p, m-cup	n-cup, cube, m-cup
t12{n,m}						n-p, 2m-p	n-cup, 3p, 2m-p
t012{n,m}							2n-p, cube, 2m-p

Table 2: lateral facets of segmentochora with axial symmetry from [[n,m]]

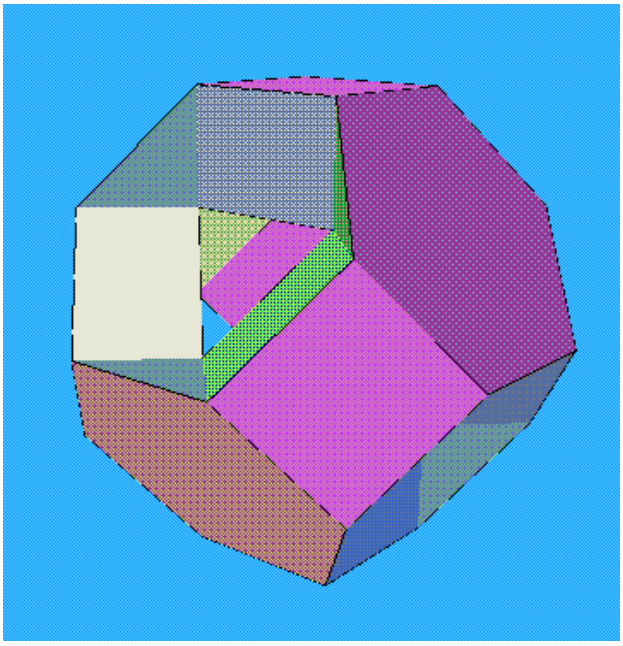

Figure 4: cuboctahedron atop truncated octahedron

Figure 4 shows an projection of the cuboctahedron atop truncated octahedron, which is an example of Table 2 (it visualizes both t1{3,4} || t01{3,4} and t02{3,3} || t012{3,3}). It was produced from data of Alex Doskey, at LSUHSC of the Lousiana State University. Therin half of the triangular cupolae are removed together with the inner cuboctahedron, in order to get the inner structure visible.

Even more generall one will have to take any 2 figures from Table 1 in any possible relative orientation and has to decide whether there would be a convex segmentochoron lying in between, i.e. whether vertices could be joined by unit edges in such a way, that the lateral facets would be from the list of Figure 3 only. This task for the 4 dimensional set has be done by the author manually within the span of summer 2000 to summer 2001. Although he has no firm proof, the author supposes the list to be complete:

The circumradius (R) of a segmentotope is readilly accessible from the circumradii of its top and bottom facets (r1, r2), the height (H) between them and (if those facets would be lower dimensional) the shear (S1, S2) of their centers parallel to those hyperplanes (taken perpendicular to one another), see Figure 5. It is given by 4*R^2*H^2 = ((r2^2 + S2^2) – (r1^2 + S1^2))^2 + 2*((r1^2 + S1^2) + (r2^2 + S2^2))*H^2 + H^4. (The easiest example for a non-vanishing shear is the square pyramid, looked at as a trigonal wedge, i.e. a line atop a trigon: the center of the line is not directly above the center of the trigon.) Clearly, due to the existance of the circum-hypersphere, non-vanishing shears are possible only for subdimensional top or bottom facets.

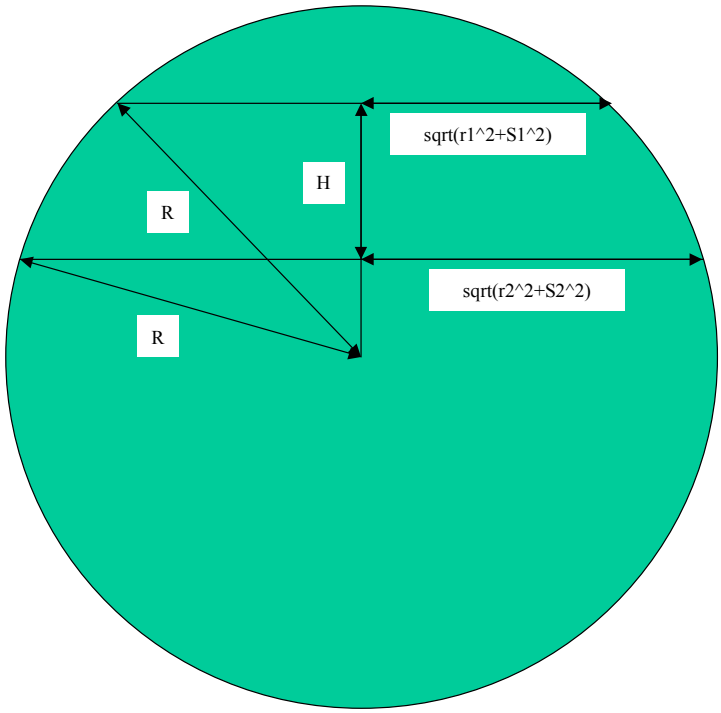

Figure 5: Getting the circumradius R as function of H, r1, r2, S1, S2

For the extrapolation of names of polyhedra to names of polychora some remarks are usefull. The name "**antiprism**" will be used in analogy to the 3D case whenever top and bottom facet

are vice versas duals. Thence only for selfdual top facets (and therefore bottom facets as well) those 2 facets are congruent, as they are for 3D antiprisms. Names will be given like this: <*top-facet* >*-antiprism* or equivalently <*bottom-facet*>*-antiprism*. Those are the cases t0{n,m} || t2{n,m} from Table 2.

The observation, that for 3D cupolas the bottom face is up to scaling the kernel of intersection of a dual pair of the top face, leads to a first extension of this name to polychora: If the top facet is a regular polyhedron (t0{n,m}), the bottom facet ought to be the corresponding quasiregular one (i.e. the rectified polyhedron, t1{n,m}). Note that the corresponding faces {n} of those are relatively rotated, they have to be joined by antiprisms, which in turn generalize the squares of 3D cupolas. Here the name "**cupola**" will further be used within 4D for all those segmentotopes, where the lateral facets are pyramids and antiprisms only. Names will be all like this: <*top-facet*>*-cupola.*

Note that there could be a possible other extrapolation of cupolae as well by generalizing the lateral squares to prisms. This would imply for regular top facets (t0{n,m}) the bottom facets to be the corresponding rhombi forms (i.e. the runcinated polyhedron, t02{n,m}). The lateral elements would then be pyramids, prisms, and trigonal prisms (seen as digonal cupolas). – But such a definition does not even apply to all possible regular top facets, for vertices of the icosahedron cannot be joined to those of the rhombicosidodecahedron using only edges of unit length, even by bending into 4D. But this does extrapolate cupolae from being monostratic cups of uniform polyhedra to monostratic cups of uniform polychora (top facets t0{n,m} imply the sectioned polychoron to be t03{3,m,n}.) Using this last observation, in here those few segmentochora are called <*polychoron*>*-s* <*top-facet*>*-cup*.

Names like "**pyramids**" and "**prisms**" extend unambiguously to higher dimensions, meaning polytopes which are 'point atop facet' resp. 'facet atop (the same ungyrated) facet'. Names will be built like this: <*bottom-facet*>*-pyramid* resp. <*top-facet*>*-prism*. – Note that only those pyramids are selfdual, where their bottom facet is selfdual in turn.

Finally "**wedges**" are defined as those segmentotopes where the top facet is subdimensional and is moreover a facet of the bottom facet. As in 3D the facets of faces are edges only, it is enough to mention the bottom face (a square-wedge is a trigonal prisms, standing on its square; a trigon-wedge is a square-pyramid, standing on its trigon). In 4D the bottom polyhedron might have different faces, thence the names are set up like *[*<*top facet*>*-al]* <*bottom-facet*>*-al wedge*. (Remind that the top facet is subdimensional.)

After these conventions the rest of this article is devoted to the explicit list of convex segmentotopes up to dimension 4. The headers are given each in the form "x || y" which is to be read as "<top facet> atop <bottom facet>". Within each symbol, x and y are in the body of this article chosen to be of ascending dimension, and, if of equal dimension, to be of ascending (facetal) circumradius. The whole list is sorted by ascending (full dimensional) circumradius, i.e polychoral curvature. Within the realm of equal circumradii they are sorted by descending height, and, if equal, the degree of gyration and diminuation is chosen to be ascending. Different views of the same segmentochoron are grouped together, sorted by descending height, and if necessary thereafter by ascending circumradii of the top facets.

Note that we distinguish for polygons, prisms and antiprisms the cases N = (2,) 3, 4, 5, 6, 8, and 10 from the others. This was done because of the possible interference with the other polyhedra of Table 1, respectively its impossibility.

2 Dimensional

2.1 point || line

height: sqrt(3/4) = 0.866025
circumradius: sqrt(1/3) = 0.577350
other names: regular trigon
comments: selfdual, regular

2.2 line || line

height: 1
circumradius: sqrt(1/2) = 0.707107
other names: square
comments: selfdual, regular

3 Dimensional

3.1 point || trigon

height: sqrt(2/3) = 0.816497
shear: 0

3.1.1 line || perpendicular line

height: sqrt(1/2) = 0.707107
shear (top): 0
shear (bottom): 0
circumradius: sqrt(3/8) = 0.612372
other names: tetrahedron, trigonal pyramid, digonal antiprism
comments: selfdual, regular
faces: 4 trigons

3.2 trigon || dual trigon

height: sqrt(2/3) = 0.816497
circumradius: sqrt(1/2) = 0.707107
other names: octahedron, trigonal antiprism
comments: regular
faces: 8 trigons

3.3 line || trigon

height: sqrt(2/3) = 0.816497
shear: 1/sqrt(12) = 0.288675

3.3.1 point || square

height: sqrt(1/2) = 0.707107
shear: 0
circumradius: 1/sqrt(2) = 0.707107
other names: square pyramid, J1, half of octahedron, trigonal wedge
comments: selfdual
faces: 4 trigons + 1 square

3.4 trigon || trigon

height: 1

3.4.1 line || square

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt(7/12) = 0.763763
other names: trigonal prism, digonal cupola, tetragonal wedge
comments: uniform
faces: 2 trigons + 3 squares

3.5 square || dual square

height: 1/sqrt(sqrt(2)) = 0.840896
circumradius: sqrt((4+sqrt(2))/8) = 0.822664
other names: square antiprism
comments: uniform
faces: 8 trigons + 2 squares

3.6 square || square

height: 1
circumradius: sqrt(3/4) = 0.866025
other names: cube, hexahedron, square prism
comments: regular
faces: 6 squares

3.7 pentagon || dual pentagon

height: sqrt((5+sqrt(5))/10) = 0.850651
circumradius: sqrt((5+sqrt(5))/8) = 0.951057
other names: pentagonal antiprism, parabidiminished icosahedron
comments: uniform
faces: 10 trigons + 2 pentagons

3.8 point || pentagon

height: sqrt((5-sqrt(5))/10) = 0.525731
shear: 0
circumradius: sqrt((5+sqrt(5))/8) = 0.951057
other names: pentagonal pyramid, J2
comments: selfdual, kind of diminished icosahedron
faces: 5 trigons + 1 pentagon

3.9 pentagon || pentagon

height: 1
circumradius: sqrt((15+2*sqrt(5))/20) = 0.9867151
other names: pentagonal prism
comments: uniform
faces: 5 squares + 2 pentagons

3.10 trigon || hexagon

height: sqrt(2/3) = 0.816497
circumradius: 1
other names: trigonal cupola, J3, half of cuboctahedron
faces: 1+3 trigons + 3 squares + 1 hexagon

3.11 hexagon || dual hexagon

height: sqrt(sqrt(3)-1) = 0.855600
circumradius: sqrt((3+sqrt(3))/4) = 1.087664
other names: hexagonal antiprism
comments: uniform
faces: 12 trigons + 2 hexagons

3.12 hexagon || hexagon

height: 1
circumradius: sqrt(5)/2 = 1.118034
other names: hexagonal prism
comments: uniform
faces: 6 squares + 2 hexagons

3.13 octagon || dual octagon

height: sqrt((1+sqrt(2+sqrt(2)))/(2+sqrt(2+sqrt(2)))) = 0.860296
circumradius: sqrt((3-sqrt(2+sqrt(2)))/(8-4*sqrt(2+sqrt(2)))) = 1.375549
other names: octagonal antiprism
comments: uniform
faces: 16 trigons + 2 octagons

3.14 octagon || octagon

height: 1
circumradius: sqrt((5+2*sqrt(2))/4) = 1.398966
other names: octagonal prism, bidiminished rhombicuboctahedron
comments: uniform
faces: 8 squares + 2 octagons

3.15 square || octagon

height: sqrt(1/2) = 0.707107
circumradius: sqrt((5+2*sqrt(2))/4) = 1.398966
other names: tetragonal cupola, J4
comments: kind of diminished rhombicuboctahedron
faces: 4 trigons + 1+4 squares + 1 octagon

3.16 decagon || dual decagon

height: sqrt((1+sqrt((5+sqrt(5))/2))/(2+sqrt((5+sqrt(5))/2))) = 0.862397
circumradius: sqrt((3-sqrt((5+sqrt(5))/2))/(8-4*sqrt((5+sqrt(5))/2))) = 1.674505
other names: decagonal antiprism
comments: uniform
faces: 20 trigons + 2 decagons

3.17 decagon || decagon

height: 1
circumradius: sqrt((7+2*sqrt(5))/4) = 1.693527
other names: decagonal prism
comments: uniform
faces: 10 squares + 2 decagons

3.18 pentagon || decagon

height: sqrt((5-sqrt(5))/10) = 0.525731
circumradius: sqrt(sqrt(5)+11/4) = 2.232951
other names: pentagonal cupola, J5
comments: kind of diminished rhombicosidodecahedron
faces: 5 trigons + 5 squares + 1 pentagon + 1 decagon

3.19 n-gon || dual n-gon (n ≠ 2, 3, 4, 5, 6, 8, 10)

height: sqrt(1+2*cos(pi/n))/(2+2*cos(pi/n)))
circumradius: sqrt((3–2*cos(pi/n))/(8–8*cos(pi/n)))
other names: n-gonal antiprism
comments: uniform
faces: 2*n trigons + 2 n-gons

3.20 n-gon || n-gon (n ≠ 3, 4, 5, 6, 8, 10)

height: 1
circumradius: sqrt(1+csc^2(pi/n))/2
other names: general n-gonal prism
comments: uniform
faces: n squares + 2 n-gons

4 Dimensional

4.1 point || tetrahedron

height: sqrt(5/8) = 0.790569
shear: 0

4.1.1 line || perpendicular trigon

height: sqrt(5/12) = 0.645497
shear (top): 0
shear (bottom): 0
circumradius: sqrt(2/5) = 0.632456
other names: pentachoron
comments: regular, selfdual
cells: 5 tetrahedra

4.2 tetrahedron || dual tetrahedron

height: 1/sqrt(2) = 0.707107
circumradius: 1/sqrt(2) = 0.707107
other names: hexadecachoron, tetrahedral antiprism
comments: regular
cells: 16 tetrahedra

4.3 point || octahedron

height: 1/sqrt(2) = 0.707107
shear: 0

4.3.1 trigon || gyrated tetrahedron

height: 1/sqrt(2) = 0.707107
shear: 1/sqrt(24) = 0.204124

circumradius: 1/sqrt(2) = 0.707107
other names: octahedral pyramid, half of hexadecachoron
comments: homohedral
cells: 8 tetrahedra + 1 octahedron

4.4 point || square pyramid

height: 1/sqrt(2) = 0.707107
shear: 0

4.4.1 line || tetrahedron

height: 1/sqrt(2) = 0.707107
shear: 1/sqrt(8) = 0.353553

4.4.2 trigon || inclined trigon

height: 1/sqrt(2) = 0.707107
shear (top): 1/sqrt(24) = 0.204124
shear (bottom): 1/sqrt(24) = 0.204124

4.4.3 line || perpendicular square

height: 1/2
shear (top): 0
shear (bottom): 0
circumradius: 1/sqrt(2) = 0.707107
other names: square-pyramidal pyramid, quarter of hexadecachoron
comments: selfdual
cells: 4 tetrahedra + 2 square pyramids

4.5 tetrahedron || octahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(3/5) = 0.774597
other names: rectified pentachoron, tetrahedral cupola
comments: uniform, homohedral
cells: 5 tetrahedra + 5 octahedra

4.6 tetrahedron || square pyramid

height: sqrt(5/8) = 0.790569

4.6.1 trigon || octahedron

height: sqrt(5/8) = 0.790569
shear: 1/sqrt(24) = 0.204124

4.6.2 trigon || gyrated trigonal prism

height: sqrt(5/12) = 0.645497
shear: 0
circumradius: sqrt(3/5) = 0.774597
other names: octahedral wedge
comments: kind of diminished rectified-pentachoron (trigon as "tetrahedron - tetrahedron" and octahedron as "octahedron - trigon")
cells: 3 tetrahedra + 2 octahedra + 3 square pyramids + 1 trigonal prism

4.7 line || square pyramid

height: sqrt(5/8) = 0.790569
shear: 1/sqrt(8) = 0.353553

4.7.1 trigon || tetrahedron

height: sqrt(5/8) = 0.790569
shear: 1/sqrt(6) = 0.408248

4.7.2 point || trigonal prism

height: sqrt(5/12) = 0.645497
shear: 0

4.7.3 trigon || orthogonal square (2 square-edges parallel to 1 trigon-edge)

height: sqrt(5/12) = 0.645497
shear (top): 0
shear (bottom): 1/sqrt(12) = 0.288675
circumradius: sqrt(3/5) = 0.774597
other names: trigonal-prismatic pyramid, tetrahedral wedge
comments: kind of diminished rectified-pentachoron (tetrahedron as "tetrahedron - trigon" and trigon as „octahedron - octahedron“)
cells: 2 tetrahedra + 3 square pyramids + 1 trigonal prism

4.8 trigon || square pyramid

height: sqrt(5/8) = 0.790569
shear: 1/sqrt(24) = 0.204124

4.8.1 square || tetrahedron

height: sqrt(5/8) = 0.790569
shear: 0

4.8.2 line || orthogonal trigonal prism

height: sqrt(5/12) = 0.645497
shear: 1/sqrt(12) = 0.288675
circumradius: sqrt(3/5) = 0.774597
other names: trigonal square-pyramidal wedge
comments: kind of bidiminished rectified-pentachoron (tetrahedron as "tetrahedron - 2 edges" and square as "octahedron - 2 square pyramids")
cells: 1 tetrahedron + 4 square pyramids + 2 trigonal prisms

4.9 tetrahedron || tetrahedron

height: 1

4.9.1 line || parallel trigonal prism

height: sqrt(2/3) = 0.816497
shear: 0

4.9.2 square || orthogonal square

height: 1/sqrt(2) = 0.707107
shear (top): 0

shear (bottom): 0
circumradius: sqrt(5/8) = 0.790569
other names: tetrahedral prism
comments: uniform
cells: 2 tetrahedra + 4 trigonal prisms

4.10 trigon || trigonal prism

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt(2/3) = 0.816497
other names: trigon-trigon-diprism, direct sum of 2 trigons, trigonal trigonal-prismatic wedge
comments: uniform, isochoric
cells: 6 trigonal prisms

4.11 octahedron || octahedron

height: 1

4.11.1 trigonal prism || gyrated trigonal prism

height: sqrt(2/3) = 0,816497
circumradius: sqrt(3/4) = 0.866025
other names: octahedral prism
comments: uniform
cells: 2 octahedra + 8 trigonal prisms

4.12 square pyramid || square pyramid

height: 1

4.12.1 square || trigonal prism

height: sqrt(2/3) = 0.816497
shear: 1/sqrt(12) = 0.288675

4.12.2 line || cube

height: sqrt(1/2) = 0.707107
shear: 0
circumradius: sqrt(3/4) = 0.866025
other names: square-pyramidal prism, square trigonal-prismatic wedge
comments: diminished octahedral-prism (twice square pyramid as "octahedron - square pyramid")
cells: 2 square pyramids + 4 trigonal prisms + 1 cube

4.13 trigonal prism || reflected orthogonal trigonal prism

height: sqrt(2/3) = 0,816497
circumradius: sqrt(3/4) = 0.866025
other names: -
comments: kind of gyrated octahedral-prism (as 2 square-pyramidal prisms (see 4.12) gyro-joined at a cube)
cells: 4 square pyramids + 4+4 trigonal prisms

4.14 square || square antiprism

height: sqrt(4-sqrt(2))/2 = 0.804019
shear: (sqrt(2)-1)/sqrt(sqrt(32)) = 0.174155

4.14.1 square || gyrated cube

height: sqrt(sqrt(8)-1)/2 = 0.676097
shear: 0
circumradius: sqrt((4+sqrt(2))/7) = 0.879465
other names: square square-antiprismatic wedge
comments: kind of bidiminished cubic-antiprism (square as "octahedron -2 square pyramids" and cube as "cube - 2 squares")
cells: 4 tetrahedra + 4 square pyramids + 2 square antiprisms + 1 cube

4.15 octahedron || cube

height: sqrt(sqrt(8)-1)/2 = 0.676097
circumradius: sqrt((4+sqrt(2))/7) = 0.879465
other names: octahedral antiprism, cubic antiprism
cells: 8+12 tetrahedra + 1 octahedron + 6 square pyramids + 1 cube

4.16 square pyramid || gyrated cube

height: sqrt(sqrt(8)-1)/2 = 0.676097
circumradius: sqrt((4+sqrt(2))/7) = 0.879465
other names: -
comments: kind of diminished cubic-antiprism (square pyramid as "octahedron - square pyramid" and cube as "cube - square")
cells: 4+4+4 tetrahedra + 1+1+4 square pyramids + 1 square antiprism + 1 cube

4.17 square || gyrated square pyramid

height: sqrt(sqrt(8)-1)/2 = 0.676097
shear: 1/2

4.17.1 point || square antiprism

height: sqrt((4-sqrt(2))/8) = 0.568527
shear: 0
circumradius: sqrt((4+sqrt(2))/7) = 0.879465
other names: square-antiprismatic pyramid
comments: kind of diminished cubic-antiprism (square as "cube - cube" and square pyramid as "octahedron - square pyramid")
cells: 8 tetrahedra + 2 square pyramids + 1 square antiprism

4.18 trigonal prism || trigonal prism

height: 1

4.18.1 square || cube

height: sqrt(3/4) = 0.866025
shear: 0

circumradius: sqrt(5/6) = 0.912871
other names: trigon-square-diprism, direct sum of trigon and square, trigonal-prismatic prism, cubic wedge
comments: uniform
cells: 4 trigonal prisms + 3 cubes

4.19 square antiprism || square antiprism

height: 1

4.19.1 cube || gyrated cube

height: sqrt(sqrt(1/2)) = 0.840896
circumradius: sqrt((6+sqrt(2))/8) = 0.962692
other names: square-antiprismatic prism
comments: uniform
cells: 8 trigonal prisms + 2 square antiprisms + 2 cubes

4.20 cube || cube

height: 1
circumradius: 1
other names: tesseract, hypercube, octachoron, square-square-diprism, cubic prism
comments: regular
cells: 8 cubes

4.21 cube || icosahedron

height: (1+sqrt(5))/4 = 0.809017
circumradius: 1
other names: -
cells: 8 tetrahedra + 12 square pyramids + 6 trigonal prisms + 1 cube + 1 icosahedron

4.22 pentagon || pentagonal antiprism

height: (1+sqrt(5))/4 = 0.809017
shear: sqrt((5-2*sqrt(5))/20) = 0.162460

4.22.1 pentagon || gyrated pentagonal prism

height: sqrt((5+2*sqrt(5))/20) = 0.688191
shear: 0
circumradius: 1
other names: pentagonal pentagonal-antiprismatic wedge
cells: 5 tetrahedra + 5 square pyramids + 2 pentagonal antiprisms + 1 pentagonal prism

4.23 tetrahedron || cuboctahedron

height: sqrt(5/8) = 0.790569
circumradius: 1
other names: half of runcinated pentachoron, half of small prismatodecachoron
cells: 1+4 tetrahedra + 4+6 trigonal prisms + 1 cuboctahedron

4.24 tetrahedron || trigonal cupola

height: sqrt(5/8) = 0.790569
circumradius: 1
comments: kind of diminished half-of-runcinated-pentachoron (tetrahedron as "tetrahedron - trigon" and trigonal cupola as "cuboctahedron - trigonal cupola")
cells: 2 tetrahedra + 6 trigonal prisms + 2 trigonal cupolae

4.25 trigon || trigonal cupola

height: sqrt(5/8) = 0.790569
shear: 1/sqrt(24) = 0.204124

4.25.1 hexagon || trigonal prism

height: sqrt(5/12) = 0.645497
shear: 0
circumradius: 1
other names: trigonal trigonal-cupolaic wedge
comments: kind of diminished half-of-runcinated-pentachoron (trigon as "tetrahedron - tetrahedron" and trigonal cupola as "cuboctahedron - trigonal cupola")
cells: 3 tetrahedra + 1+3 trigonal prism + 2 trigonal cupolae

4.26 square || square pyramid

height: 1/sqrt(2) = 0.707107
shear: 1/sqrt(2) = 0.707107

4.26.1 point || cube

height: 1/2
shear: 0
circumradius: 1
other names: cubic pyramid, tetragonal square-pyramidal wedge
comments: kind of diminished octahedral-cupola (square as "cuboctahedron - cuboctahedron" and square pyramid as "octahedron - square pyramid")
cells: 6 square pyramids + 1 cube

4.27 trigon || gyrated trigonal cupola

height: 1/sqrt(2) = 0.707107
shear: 1/sqrt(6) = 0.408248

4.27.1 hexagon || octahedron

height: 1/sqrt(2) = 0.707107
shear: 0
circumradius: 1
other names: -
comments: kind of (bi-)diminished octahedral-cupola (trigon as "octahedron - octahedron" and trigonal cupola as "cuboctahedron - trigonal cupola" -resp.- octahedron as "octahedron - 2 trigons" and hexagon as "cuboctahedron - 2 trigonal cupolae")

cells: 1 octahedron + 6 square pyramids + 2 trigonal cupolae

4.28 square || cuboctahedron

height: 1/sqrt(2) = 0.707107
shear: 0
circumradius: 1
other names: tetragonal cuboctahedral wedge
comments: kind of bidiminished octahedral-cupola (cuboctahedron as "cuboctahedron - 2 squares" and square as "octahedron - 2 square pyramids")
cells: 4+8 square pyramids + 2 cubes + 1 cuboctahedron

4.29 octahedron || cuboctahedron

height: 1/sqrt(2) = 0.707107
circumradius: 1
other names: octahedral cupola, icositetrachoral octahedron-cup, half of icositetrachoron
cells: 1+8 octahedra + 6 square pyramids + 1 cuboctahedron

4.30 octahedron || trigonal cupola

height: 1/sqrt(2) = 0.707107
circumradius: 1
other names: -
comments: kind of diminished octahedral cupola (octahedron as "octahedron - trigon" and trigonal cupola as "cuboctahedron - trigonal cupola")
cells: 2+3 octahedra + 6 square pyramids + 2 trigonal cupolae

4.31 square pyramid || cuboctahedron

height: 1/sqrt(2) = 0.707107
circumradius: 1
other names: -
comments: kind of diminished octahedral cupola (square pyramid as "octahedron - square pyramid" and cuboctahedron as "cuboctahedron - square")
cells: 4 octahedra + 1+1+4+4 square pyramids + 1 cube + 1 cuboctahedron

4.32 square pyramid || trigonal cupola

height: 1/sqrt(2) = 0.707107
circumradius: 1
other names: -
comments: kind of bidiminished octahedral cupola (square pyramid as "octahedron - square pyramid - trigon" and trigonal cupola as "cuboctahedron - trigon - trigonal cupola")
cells: 1 octahedron + 2+2+4 square pyramids + 1 cube + 2 trigonal cupolae

4.33 trigon || tridiminished icosahedron

height: 1/2
shear: (3-sqrt(5))/(4*sqrt(3)) = 0.110264
circumradius: 1
other names: trigonal tridiminished-icosahedral wedge
cells: 3 tetrahedra + 1 octahedron + 3 square pyramids + 1 trigonal prism + 3 pentagonal pyramids + 1 tridiminished icosahedron

4.34 pentagon || pentagonal prism

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt((25+3*sqrt(5))/30) = 1.028076
other names: trigon-pentagon-diprism, direct sum of trigon and pentagon, pentagonal pentagonal-prismatic wedge
comments: uniform
cells: 5 trigonal prisms + 3 pentagonal prisms

4.35 cube || cuboctahedron

height: sqrt(sqrt(2)-3/4) = 0.814993
circumradius: sqrt((16+6*sqrt(2))/23) = 1.031784
other names: cubic cupola
cells: 8 tetrahedra + 6 square antiprisms + 1 cube + 1 cuboctahedron

4.36 icosahedron || icosahedron

height: 1
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: icosahedral prism
comments: uniform
cells: 20 trigonal prisms + 2 icosahedra

4.37 gyroelongated pentagonal pyramid || gyroelongated pentagonal pyramid

height: 1
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: gyroelongated-pentagonal-pyramidal prism
comments: kind of diminished icosahedral-prism (twice: gyroelongated pentagonal pyramid (J11) as "icosahedron - pentagonal pyramid")
cells: 5+5+5 trigonal prisms + 1 pentagonal prism + 2 gyroelongated pentagonal pyramid

4.38 pentagonal pyramid || pentagonal pyramid

height: 1

4.38.1 line || pentagonal prism

height: sqrt((5-sqrt(5))/10) = 0.525731
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: pentagonal-pyramidal prism
comments: kind of diminished icosahedral-prism (twice: pentagonal pyramid as "icosahedron - gyroelongated pentagonal pyramid (J11)")
cells: 5 trigonal prisms + 2 pentagonal pyramids + 1 pentagonal prism

4.39 pentagonal antiprism || pentagonal antiprism

height: 1

4.39.1 pentagonal prism || gyrated pentagonal prism

height: sqrt((5+sqrt(5))/10) = 0.850651
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: pentagonal-antiprismatic prism
comments: uniform, kind of parabidiminished icosahedral-prism (twice: pentagonal antiprism as "icosahedron - 2 pentagonal pyramids")
cells: 10 trigonal prisms + 2 pentagonal antiprisms + 2 pentagonal prisms

4.40 metabidiminished icosahedron || metabidiminished icosahedron

height: 1
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: metabidiminished-icosahedral prism
comments: kind of bidiminished icosahedral-prism (twice: metabidiminished icosahedron (J62) as "icosahedron - 2 pentagonal pyramids")
cells: 2+2+2+4 trigonal prisms + 2 pentagonal prisms + 2 metabidiminished icosahedra

4.41 tridiminished icosahedron || tridiminished icosahedron

height: 1
circumradius: sqrt((7+sqrt(5))/8) = 1.074481
other names: tridiminished-icosahedral prism
comments: kind of tridiminished icosahedral-prism (twice: tridiminished icosahedron (J63) as "icosahedron - 3 pentagonal pyramids")
cells: 1+1+3 trigonal prisms + 3 pentagonal prisms + 2 tridiminished icosahedra

4.42 pentagonal prism || pentagonal prism

height: 1
circumradius: sqrt((10+sqrt(5))/10) = 1.106168
other names: pentagonal-prismatic prism, square-pentagon-diprism, direct sum of square and pentagon
comments: uniform
cells: 5 cubes + 4 pentagonal prisms

4.43 cuboctahedron || cuboctahedron

height: 1
circumradius: sqrt(5)/2 = 1.118034
other names: cuboctahedral prism
comments: uniform
cells: 8 trigonal prisms + 6 cubes + 2 cuboctahedra

4.44 trigonal orthobicupola || trigonal orthobicupola

height: 1
circumradius: sqrt(5)/2 = 1.118034
other names: trigonal-orthobicupolaic prism
comments: kind of gyrated cuboctahedral-prism (as 2 trigonal-cupolaic prisms (see 4.45) joined at the hexagonal prism)
cells: 2+6 trigonal prisms + 6 cubes + 2 trigonal orthobicupolae

4.45 trigonal cupola || trigonal cupola

height: 1

4.45.1 trigonal prism || hexagonal prism

height: sqrt(2/3) = 0.816497
circumradius: sqrt(5)/2 = 1.118034
other names: trigonal-cupolaic prism, half of cuboctahedral prism
cells: 1+3 trigonal prisms + 3 cubes + 2 trigonal cupolae + 1 hexagonal prism

4.46 hexagon || hexagonal antiprism

height: sqrt((7-sqrt(3))/8) = 0.811476
shear: sqrt((sqrt(27)-5)/8) = 0.156586

4.46.1 hexagon || gyrated hexagonal prism

height: sqrt(sqrt(3)-5/4) = 0.694299
shear: 0
circumradius: sqrt((19+6*sqrt(3))/23) = 1.130454
other names: hexagonal hexagonal-antiprismatic wedge
cells: 6 tetrahedra + 6 square pyramids + 2 hexagonal antiprisms + 1 hexagonal prism

4.47 hexagon || hexagonal prism

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt(4/3) = 1.154701
other names: trigon-hexagon-diprism, direct sum of trigon and hexagon, hexagonal hexagonal-

prismatic wedge
comments: uniform
cells: 6 trigonal prisms + 3 hexagonal prisms

4.48 cuboctahedron || truncated tetrahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(7/5) = 1.183216
other names: cuboctahedral monostratic cup of cantellated pentachoron, cuboctahedral monostratic cup of small rhombated pentachoron
comments: kind of diminished cantellated pentachoron (as "cantellated pentachoron - octahedral monostratic cup of cantellated pentachoron (see 4.52)")
cells: 4 octahedra + 6 trigonal prisms + 1 cuboctahedron + 4 trigonal cupolae + 1 truncated tetrahedron

4.49 trigonal orthobicupola || truncated tetrahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(7/5) = 1.183216
other names: -
comments: kind of gyrated cuboctahedral-monostratic-cup-of-cantellated-pentachoron (trigonal orthobicupola (J27) as "2 trigonal cupolae" and truncated tetrahedron as "(truncated tetrahedron - hexahedron) + hexahedron" (see 4.50, 4.51) joined at the hexagonal prism)
cells: 1 octahedron + 3+3 square pyramids + 3+3 trigonal prisms + 1 trigonal orthobicupola + 1+3 trigonal cupolae + 1 truncated tetrahedron

4.50 trigonal cupola || truncated tetrahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(7/5) = 1.183216
other names: -
comments: kind of diminished cuboctahedral-monostratic-cup-of-cantellated-pentachoron (trigonal cupola as "cuboctahedron - trigonal cupola" and truncated tetrahedron as "truncated tetrahedron - hexagon")
cells: 1 octahedron + 3 square pyramids + 3 trigonal prisms + 1+3 trigonal cupolae + 1 hexagonal prism + 1 truncated tetrahedron

4.51 hexagon || trigonal cupola

height: sqrt(5/8) = 0.790569
shear: sqrt(3/8) = 0.612372

4.51.1 trigon || hexagonal prism

height: sqrt(5/12) = 0.645497
shear: 0
circumradius: sqrt(7/5) = 1.183216
other names: hexagonal trigonal-cupolaic wedge
comments: kind of diminished cuboctahedral-monostratic-cup-of-cantellated-pentachoron (trigonal cupola as "cuboctahedron - trigonal cupola" and hexagon as "truncated tetrahedron - truncated tetrahedron")
cells: 3 square pyramids + 3 trigonal prisms + 2 trigonal cupolae + 1 hexagonal prism

4.52 octahedron || truncated tetrahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(7/5) = 1.183216
other names: octahedral monostratic cup of cantellated pentachoron, octahedral monostratic cup of small rhombated pentachoron
comments: kind of diminished cantellated-pentachoron (as "cantellated pentachoron - cuboctahedral monostratic cup of cantellated pentachoron (see 4.48)")
cells: 1 octahedron + 4 trigonal prisms + 4 trigonal cupolae + 1 truncated tetrahedron

4.53 hexagonal antiprism || hexagonal antiprism

height: 1

4.53.1 hexagonal prism || gyrated hexagonal prism

height: sqrt(sqrt(3)-1) = 0.855600
circumradius: sqrt((4+sqrt(3))/4) = 1.197085
other names: hexagonal-antiprismatic prism
comments: uniform
cells: 12 trigonal prisms + 2 hexagonal antiprisms + 2 hexagonal prisms

4.54 hexagonal prism || hexagonal prism

height: 1
circumradius: sqrt(3/2) = 1.224745
other names: hexagonal-prismatic prism, square-hexagon-diprism, direct sum of square and hexagon
comments: uniform
cells: 6 cubes + 4 hexagonal prisms

4.55 truncated tetrahedron || inverse truncated tetrahedron

height: sqrt(1/2) = 0.707107
circumradius: sqrt(3/2) = 1.224745
other names: equatorial tetrahedral segment of rectified tesseract
comments: weakly uniform
cells: 6 tetrahedra + 8 trigonal cupola + 2 truncated tetrahedra

4.56 tetrahedron || truncated tetrahedron

height: sqrt(1/2) = 0.707107
circumradius: sqrt(3/2) = 1.224745
other names: tetrahedral monostratic cup of rectified tesseract
cells: 1+4 tetrahedra + 4 trigonal cupolae + 1 truncated tetrahedron

4.57 truncated tetrahedron || truncated tetrahedron

height: 1
circumradius: sqrt(13/8) = 1.274755
other names: truncated-tetrahedral prism
comments: uniform
cells: 4 trigonal prisms + 4 hexagonal prisms + 2 truncated tetrahedra

4.58 octagon || octagonal antiprism

height:
sqrt((2+3*sqrt(2+sqrt(2)))/(4+4*sqrt(2+sqrt(2)))) = 0.813764
shear:
1/sqrt(16+4*sqrt(2)+12*sqrt(2+sqrt(2))) = 0.151048

4.58.1 octagon || gyrated octagonal prism

height:
sqrt((2+3*sqrt(2+sqrt(2)))/(8+4*sqrt(2+sqrt(2)))) = 0.700077
shear: 0
circumradius: sqrt((2*sqrt(2+sqrt(2))-sqrt(2))/(4*sqrt(2+sqrt(2))-3*sqrt(2)-2)) = 1.409438
other names: octagonal octagonal-antiprismatic wedge
cells: 8 tetrahedra + 8 square pyramids + 2 octagonal antiprisms + 1 octagonal prism

4.59 octagon || octagonal prism

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt((8+3*sqrt(2))/6) = 1.428440
other names: trigon-octagon-diprism, direct sum of trigon and octagon, octagonal octagonal-prismatic wedge
comments: uniform
cells: 8 trigonal prisms + 3 octagonal prisms

4.60 snub cube || snub cube

height: 1
circumradius: sqrt((7-8*cos^2(x))/(12-16*cos^2(x))) = 1.433724
other names: snub-cubic prism
comments: uniform, x is half of the centriangle underneeth an edge of length 1 in the vertex figure of the snub cube: cos(x) = (cbrt(1+sqrt(11/27))+cbrt(1-sqrt(11/27)))/cbrt(sqrt(128)) = 0.842509
cells: 8+24 trigonal prisms + 6 cubes + 2 snub cubes

4.61 cuboctahedron || rhombicuboctahedron

height: sqrt((sqrt(8)-1)/4) = 0.676097
circumradius: (1+sqrt(8))/sqrt(7) = 1.447009
other names: cuboctahedral cupola
cells: 8 octahedra + 12 square pyramids + 6 square antiprisms + 1 cuboctahedron + 1 rhombicuboctahedron

4.62 cuboctahedron || elongated square cupola

height: sqrt((sqrt(8)-1)/4) = 0.676097
circumradius: (1+sqrt(8))/sqrt(7) = 1.447009
other names: -
comments: kind of diminished cuboctahedral-cupola (cuboctahedron as "cuboctahedron - square" and elongated square cupola (J19) as "rhombicuboctahedron - square cupola")
cells: 4 octahedra + 4+4+4 square pyramids + 1+4 square antiprisms + 1 cuboctahedron + 1 elongated square cupola + 1 square cupola

4.63 cuboctahedron || octagonal prism

height: sqrt((sqrt(8)-1)/4) = 0.676097
circumradius: (1+sqrt(8))/sqrt(7) = 1.447009
other names: -
comments: kind of bidiminished cuboctahedral-cupola (cuboctahedron as "cuboctahedron - 2 squares" and octagonal prism as "rhombicuboctahedron - 2 square cupolae")
cells: 4+8 square pyramids + 4 square antiprisms + 1 cuboctahedron + 2 square cupolae + 1 octagonal prism

4.64 square || gyrated square cupola

height: sqrt((sqrt(8)-1)/4) = 0.676097
shear: 1/sqrt(2) = 0.707107

4.64.1 octagon || square antiprism

height: sqrt((4-sqrt(2))/8) = 0.568527
shear: 0
circumradius: (1+sqrt(8))/sqrt(7) = 1.447009
other names: -
comments: kind of diminished cuboctahedral-cupola (square as "cuboctahedron - cuboctahedron" and square cupola as "rhombicuboctahedron - elongated square cupola")
cells: 8 square pyramids + 1 square antiprism + 2 square cupolae

4.65 octagonal antiprism || octagonal antiprism

height: 1

4.65.1 octagonal prism || gyrated octagonal prism

height: sqrt((1+sqrt(2+sqrt(2)))/(2+sqrt(2+sqrt(2)))) = 0.860296
circumradius: sqrt((5-2*sqrt(2+sqrt(2)))/(8-4*sqrt(2+sqrt(2)))) = 1.463603
other names: octagonal-antiprismatic prism
comments: uniform
cells: 16 trigonal prisms + 2 octagonal antiprisms + 2 octagonal prisms

4.66 rhombicuboctahedron || rhombicuboctahedron

height: 1
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: rhombicuboctahedral prism, equatorial monostratic segment of runcinated tesseract, equatorial monostratic segment of runcinated octachoron, equatorial monostratic segment of runcinated hexadecachoron, equatorial monostratic segment of small diprismatotesseractihexadecachoron
comments: uniform, kind of parabidiminished runcinated-tesseract (as "runcinated tesseract - 2 cubic monostratic cups of runcinated tesseract (see 4.71)")
cells: 8 trigonal prisms + 6+12 cubes + 2 rhombicuboctahedra

4.67 elongated square gyrobicupola || elongated square gyrobicupola

height: 1
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: elongated-square-gyrobicupolaic prism
comments: kind of gyrated rhombicuboctahedral-prism (twice: elongated square gyrobicupola (J37) as "elongated square cupola (J19) + square cupola" (see 4.68, 4.69) joined at the octagonal prism)
cells: 8 trigonal prisms + 2+8+8 cubes + 2 elongated square gyrobicupolae

4.68 elongated square cupola || elongated square cupola

height: 1
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: elongated-square-cupolaic prism
comments: kind of diminished rhombicuboctahedral-prism (twice: elongated square cupola (J19) as "rhombicuboctahedron - square cupola")
cells: 4 trigonal prisms + 1+4+4+4 cubes + 2 elongated square cupolae + 1 octagonal prism

4.69 square cupola || square cupola

height: 1

4.69.1 cube || octagonal prism

height: 1/sqrt(2) = 0.707107
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: square-cupolaic prism
comments: kind of bidiminished cubic-monostratic-cup-of-small-diprismatotesseractihexadecachoron (cube as "cube - 2 squares" and octagonal prism as "rhombicuboctahedron - 2 square cupolae") -resp.- kind of diminished rhombicuboctahedral-prism (twice: square cupola as "rhombicuboctahedron - elongated square cupola (J19)")
cells: 4 trigonal prisms + 1+4 cubes + 2 square cupolae + 1 octagonal prism

4.70 octagonal prism || octagonal prism

height: 1
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: octagonal-prismatic prism
comments: uniform, kind of parabidiminished rhombicuboctahedral-prism (twice: octagonal prism as "rhombicuboctahedron - 2 square cupolae")
cells: 8 cubes + 4 octagonal prisms

4.71 cube || rhombicuboctahedron

height: 1/sqrt(2) = 0.707107
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: cubic monostratic cup of runcinated tesseract, cubic monostratic cup of runcinated octachoron, cubic monostratic cup of runcinated hexadecachoron, cubic monostratic cup of small diprismatotesseractihexadecachoron
cells: 8 tetrahedra + 12 trigonal prisms + 1+6 cubes + 1 rhombicuboctahedron

4.72 cube || elongated square cupola

height: 1/sqrt(2) = 0.707107
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: -
comments: kind of diminished cubic-monostratic-cup-of-runcinated-tesseract (cube as "cube - square" and elongated square cupola (J19) as "rhombicuboctahedron - square cupola")
cells: 4 tetrahedra + 4+4 trigonal prisms + 1+1+4 cubes + 1 elongated square cupola + 1 square cupola

4.73 square || square cupola

height: 1/sqrt(2) = 0.707107
shear: 1/2

4.73.1 octagon || cube

height: 1/2
shear: 0
circumradius: sqrt((3+sqrt(2))/2) = 1.485634
other names: tetragonal square-cupolaic wedge
comments: kind of diminished cubic-monostratic-cup-of-small-diprismatotesseractihexadecachoron (square as "cube - cube" and square cupola as "rhombicuboctahedron - elongated square cupola")
cells: 4 tetrahedra + 2 square pyramids + 4 trigonal prisms + 1 cube

4.74 dodecahedron || dodecahedron

height: 1
circumradius: sqrt((11+3*sqrt(5))/8) = 1.487792
other names: dodecahedral prism
comments: uniform
cells: 12 pentagonal prisms + 2 dodecahedra

4.75 rhombicuboctahedron || truncated octahedron

height: sqrt(sqrt(2)-3/4) = 0.814993
circumradius: sqrt((35+16*sqrt(2))/23) = 1.582890
other names: -
cells: 12 trigonal prisms + 6 square antiprisms + 8 trigonal cupolae + 1 rhombicuboctahedron + 1 truncated octahedron

4.76 truncated tetrahedron || truncated octahedron

height: sqrt(5/8) = 0.790569
circumradius: sqrt(13/5) = 1.612452
other names: truncated-tetrahedral monostratic cup of runcinated pentachoron, truncated-tetrahedral monostratic cup of prismatorhombated pentachoron
cells: 6 trigonal prisms + 4 trigonal cupolae + 4 hexagonal prisms + 1 truncated tetrahedron + 1 truncated octahedron

4.77 dodecahedron || icosidodecahedron

height: (1+sqrt(5))/4 = 0.809017
circumradius: (1+sqrt(5))/2 = 1.618034
other names: dodecahedral cupola
cells: 20 tetrahedra + 12 pentagonal antiprisms + 1 dodecahedron + 1 icosidodecahedron

4.78 icosahedron || dodecahedron

height: 1/2
circumradius: (1+sqrt(5))/2 = 1.618034
other names: icosahedral antiprism, dodecahedral antiprism
cells: 20+30 tetrahedra + 1 icosahedron + 12 pentagonal pyramids + 1 dodecahedron

4.79 gyroelongated pentagonal pyramid || dodecahedron

height: 1/2
circumradius: (1+sqrt(5))/2 = 1.618034
other names: -
comments: kind of diminished dodecahedral-antiprism (gyroelongated pentagonal pyramid (J11) as "icosahedron - pentagonal pyramid" and dodecahedron as "dodecahedron - pentagon")
cells: 5+5+5+5+5+5+10 tetrahedra + 1 gyroelongated pentagonal pyramid + 1+5+5 pentagonal pyramids + 1 pentagonal antiprism + 1 dodecahedron

4.80 pentagon || gyrated pentagonal pyramid

height: 1/2
shear: sqrt((25+11*sqrt(5))/40) = 1.113516

4.80.1 point || pentagonal antiprism

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: pentagonal-antiprismatic pyramid
comments: parabidiminished icosahedral pyramid, kind of diminished dodecahedral-antiprism (pentagonal pyramid as "icosahedron - gyroelongated pentagonal pyramid (J11)" and pentagon as "dodecahedron - dodecahedron")
cells: 10 tetrahedra + 2 pentagonal pyramids + 1 pentagonal antiprism

4.81 pentagonal antiprism || dodecahedron

height: 1/2
circumradius: (1+sqrt(5))/2 = 1.618034
other names: -
comments: pentagonal-antiprismal monostratic cup of great antiprism, kind of bidiminished dodecahedral-antiprism (pentagonal antiprism as "icosahedron - 2 pentagonal pyramids" and dodecahedron " as dodecahedron - 2 pentagons")
cells: 10+10+10 tetrahedra + 10 pentagonal pyramids + 1+2 pentagonal antiprisms + 1 dodecahedron

4.82 metabidiminished icosahedron || dodecahedron

height: 1/2
circumradius: (1+sqrt(5))/2 = 1.618034

other names: -
comments: kind of bidiminished dodecahedral-antiprism (metabidiminished icosahedron (J62) as "icosahedron - 2 pentagonal pyramids" and dodecahedron " as dodecahedron - 2 pentagons")
cells: 1+1+2+2+2+2+4+4+4+4+4 tetrahedra + 2+2+2+4 pentagonal pyramids + 2 pentagonal antiprisms + 1 metabidiminished icosahedron + 1 dodecahedron

4.83 tridiminished icosahedron || dodecahedron

height: 1/2
circumradius: (1+sqrt(5))/2 = 1.618034
other names: -
comments: kind of tridiminished dodecahedral-antiprism (tridiminished icosahedron (J63) as "icosahedron - 3 pentagonal pyramids" and dodecahedron " as dodecahedron - 3 pentagons")
cells: 1+1+3+3+3+3+6 tetrahedra + 3+3+3 pentagonal pyramids + 3 pentagonal antiprisms + 1 tridiminished icosahedron + 1 dodecahedron

4.84 point || icosahedron

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: icosahedral pyramid
comments: homohedral
cells: 20 tetrahedra + 1 icosahedron

4.85 point || gyroelongated pentagonal pyramid

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: gyroelongated-pentagonal-pyramidal pyramid
comments: kind of diminished icosahedral-pyramid (point as "point - point" and gyroelongated pentagonal pyramid (J11) as "icosahedron - pentagonal pyramid")
cells: 5+5+5 tetrahedra + 1 gyroelongated pentagonal pyramid + 1 pentagonal pyramid

4.86 point || pentagonal pyramid

height: (sqrt(5)-1)/4 = 0.309017
shear: 0

4.86.1 line || perpendicular pentagon

height: sqrt((5-2*sqrt(5))/20) = 0.162460
shear (top): 0
shear (bottom): 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: pentagonal-pyramidal pyramid
comments: selfdual, kind of diminished icosahedral-pyramid (point as "point - point" and pentagonal pyramid as "icosahedron - gyroelongated pentagonal pyramid (J11)")
cells: 5 tetrahedra + 2 pentagonal pyramids

4.87 point || metabidiminished icosahedron

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: metabidiminished-icosahedral pyramid
comments: kind of bidiminished icosahedral-pyramid (point as "point - 2 points" and metabidiminished icosahedron (J62) as "icosahedron - 2 pentagonal pyramids")
cells: 2+2+2+4 tetrahedra + 2 pentagonal pyramids + 1 metabidiminished icosahedron

4.88 point || tridiminished icosahedron

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: (1+sqrt(5))/2 = 1.618034
other names: tridiminished-icosahedral pyramid
comments: kind of tridiminished icosahedral-pyramid (point as "point - 3 points" and metabidiminished icosahedron (J63) as "icosahedron - 3 pentagonal pyramids")
cells: 1+1+3 tetrahedra + 3 pentagonal pyramids + tridiminished icosahedron

4.89 truncated octahedron || truncated octahedron

height: 1
circumradius: sqrt(11/4) = 1.658312
other names: truncated-octahedral prism
comments: uniform
cells: 6 cubes + 8 hexahedral prisms + 2 truncated octahedra

4.90 icosidodecahedron || icosidodecahedron

height: 1
circumradius: sqrt(7+2*sqrt(5))/2 = 1.693527
other names: icosidodecahedral prism
comments: uniform
cells: 20 trigonal prisms + 12 pentagonal prisms + 2 icosidodecahedra

4.91 orthobirotunda || orthobirotunda

height: 1
circumradius: sqrt(7+2*sqrt(5))/2 = 1.693527
other names: orthobirotundaic prism

comments: kind of gyrated icosidodecahedral-prism (twice: orthobirotunda as "rotunda + rotunda" (see 4.92) joined at the decagonal prism)
cells: 10+10 trigonal prisms + 2+10 pentagonal prisms + 2 orthobirotundae

4.92 rotunda || rotunda

height: 1
circumradius: sqrt(7+2*sqrt(5))/2 = 1.693527
other names: rotundaic prism, half of icosidodecahedral prism
cells: 5+5 trigonal prisms + 1+5 pentagonal prisms + 2 rotundae + 1 decagonal prism

4.93 decagon || decagonal antiprism

height:
sqrt((sqrt(8)+3*sqrt(5+sqrt(5)))/(2*sqrt(8)+4*sqrt(5+sqrt(5)))) = 0.814774
shear:
1/sqrt(18+2*sqrt(5)+3*sqrt(8)*sqrt(5+sqrt(5))) = 0.148581

4.93.1 decagon || gyrated decagonal prism

height:
sqrt((sqrt(8)+3*sqrt(5+sqrt(5)))/(4*sqrt(8)+4*sqrt(5+sqrt(5)))) = 0.702658
shear: 0
circumradius: sqrt((sqrt(8)*sqrt(5+sqrt(5))-1-sqrt(5))/(2*sqrt(8)*sqrt(5+sqrt(5))-7-3*sqrt(5))) = 1.702385
other names: decagonal decagonal-antiprismatic wedge
cells: 10 tetrahedra + 10 square pyramids + 2 decagonal antiprisms + 1 decagonal prism

4.94 decagon || decagonal prism

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt((11+3*sqrt(5))/6) = 1.717954
other names: trigon-decagon-diprism, direct sum of trigon and decagon, decagonal decagonal-prismatic wedge
comments: uniform
cells: 10 trigonal prisms + 3 decagonal prisms

4.95 cuboctahedron || truncated octahedron

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(3) = 1.732051
other names: cuboctahedral monostratic cup of rectified icositetrachoron
cells: 6 cube + 1 cuboctahedron + 8 trigonal cupolae + 1 truncated octahedron

4.96 decagonal antiprism || decagonal antiprism

height: 1

4.96.1 decagonal prism || gyrated decagonal prism

height:
sqrt((sqrt(2)+sqrt(5+sqrt(5)))/(2*sqrt(2)+sqrt(5+sqrt(5)))) = 0.862397
circumradius: sqrt((5*sqrt(2)-2*sqrt(5+sqrt(5)))/(8*sqrt(2)-4*sqrt(5+sqrt(5)))) = 1.747560
other names: decagonal-antiprismatic prism
comments: uniform
cells: 20 trigonal prisms + 2 decagonal antiprisms + 2 decagonal prisms

4.97 decagonal prism || decagonal prism

height: 1
circumradius: sqrt((4+sqrt(5))/4) = 1.765796
other names: decagonal-prismatic prism, square-decagon-diprism, direct sum of square and decagon
comments: uniform
cells: 10 cubes + 4 decagonal prisms

4.98 truncated octahedron || truncated cube

height: sqrt((sqrt(8)-1)/4) = 0.676097
circumradius: sqrt((11+8*sqrt(2))/7/ = 1.785406
other names: -
cells: 12 tetrahedra + 8 trigonal cupolae + 6 square cupolae + 1 truncated octahedron + 1 truncated cube

4.99 truncated cube || truncated cube

height: 1
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: truncated-cubic prism, equatorial rhombicuboctahedral segment of small rhombated tesseract, equatorial rhombicuboctahedral segment of cantellated tesseract
comments: uniform
cells: 8 trigonal prisms + 6 octagonal prisms + 2 truncated cubes

4.100 rhombicuboctahedron || truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: rhombicuboctahedral monostratic cup of cantellated octachoron, rhombicuboctahedral monostratic cup of cantellated tesseract, rhombicuboctahedral monostratic cup of small rhombated tesseract

cells: 8 octahedra + 12 trigonal prisms + 1 rhombicuboctahedron + 6 square cupolae + 1 truncated cube

4.101 elongated square gyrobicupola || truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: 2 kinds of gyrated rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (elongated square gyrobicupola (J37) as "elongated square cupola (J19) + square cupola" (depending on which being gyrated) and truncated cube as "truncated cube + octagon" (see 4.103 resp. 4.104, and 4.105) joined at the octagonal prism)
cells: 4 octahedra + 4+4 square pyramids + 4+4+4 trigonal prisms + 1 elongated square gyrobicupola + 1+1+4 square cupolae + 1 truncated cube

4.102 rhombicuboctahedron || gyrated truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of bigyrated rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (rhombicuboctahedron as "octagonal prism + 2 square cupolae" and truncated cube as "truncated cube + 2 octagons" (see 4.104, 4.105) joined at the octagonal prisms)
cells: 8+8 square pyramids + 4+8 trigonal prisms + 1 rhombicuboctahedron + 2+4 square cupolae + 1 truncated cube

4.103 elongated square cupola || truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of diminished rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (elongated square cupola (J19) as "rhombicuboctahedron - square cupola" and truncated cube as "truncated cube - octagon")
cells: 4 octahedra + 4 square pyramids + 4+4 triangular prisms + 1 elongated square cupola + 1+4 square cupolae + 1 octagonal prism + 1 truncated cube

4.104 elongated square cupola || gyrated truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of diminished gyrated rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (elongated square cupola (J19) as "rhombicuboctahedron - 2 square cupolae + square cupola " and truncated cube as "truncated cube - 2 octagons + octagon": diminishing 4.102 resp. gyrating 4.103 as "4.106 + 4.105" joining at an octagonal prism)
cells: 4+4+4 square pyramids + 4+4 trigonal prisms + 1 elongated square cupola + 1+4 square cupolae + 1 octagonal prism + 1 truncated cube

4.105 octagon || square cupola

height: 1/sqrt(2) = 0.707107
shear: (1+sqrt(2))/2 = 1.207107

4.105.1 square || octagonal prism

height: 1/2
shear: 0
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of diminished gyrated rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (square cupola as "rhombicuboctahedron - elongated square cupola (J19)" and octagon as "truncated cube - truncated cube") -resp.- kind of bidiminished octahedral-monostratic-cup-of-runcinated-icositetrachoron (square as "octahedron - 2 square pyramids" and octagonal prism as "rhombicuboctahedron - 2 square cupolae")
cells: 4 square pyramids + 4 trigonal prisms + 2 square cupolae + 1 octagonal prism

4.106 octagonal prism || truncated cube

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of bidiminished gyrated rhombicuboctahedral-monostratic-cup-of-cantellated-octachoron (octagonal prism as "rhombicuboctahedron - 2 square cupolae" and truncated cube as "truncated cube - 2 octagons")
cells: 8 square pyramids + 4 trigonal prisms + 4 square cupolae + 1+2 octagonal prisms + 1 truncated cube

4.107 octahedron || rhombicuboctahedron

height: 1/2
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: octahedral monostratic cup of runcinated icositetrachoron, octahedral monostratic cup of small prismatotetracontaoctachoron
cells: 1 octachoron + 6 square pyramids + 8+12 trigonal prisms + 1 rhombicuboctahedron

4.108 square pyramid || elongated square cupola

height: 1/2
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of diminished octahedral-monostratic-cup-of-runcinated-icositetrachoron (square pyramid as "octahedron - square pyramid" and elongated square cupola (J19) as "rhombicuboctahedron - square cupola")
cells: 1+1+4 square pyramids + 4+4+4 trigonal prisms + 1 elongated square cupola + 1 square cupola

4.109 square pyramid || square cupola

height: 1/2
circumradius: sqrt(2+sqrt(2)) = 1.847759
other names: -
comments: kind of diminished octahedral-monostratic-cup-of-runcinated-icositetrachoron (square pyramid as "octahedron - square pyramid" and square cupola as "rhombicuboctahedron - elongated square cupola (J19) ")
cells: 8 square pyramids + 2 trigonal prisms + 2 square cupolae

4.110 snub dodecahedron || snub dodecahedron

height: 1
circumradius: sqrt((7-8*cos^2(x))/(12-16*cos^2(x))) = 2.213060
other names: snub-dodecahedral prism
comments: uniform, x is half of the centriangle underneeth an edge of length 1 in the vertex figure of the snub dodecahedron: cos(x) = (cbrt(9+9*sqrt(5)+sqrt(102+162*sqrt(5)))+cbrt(9+9*sqrt(5)-sqrt(102+162*sqrt(5))))/cbrt(288) = 0.857781
cells: 20+60 trigonal prisms + 12 pentagonal prisms + 2 snub dodecahedra

4.111 rhombicosidodecahedron || rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: rhombicosidodecahedral prism
comments: uniform
cells: 20 trigonal prisms + 30 cubes + 12 pentagonal prisms + 2 rhombicosidodecahedra

4.112 gyrated rhombicosidodecahedron || gyrated rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: gyrated-rhombicosidodecahedral prism
comments: kind of gyrated rhombicosidodecahedral-prism (twice: gyrated rhombicosidodecahedron (J72) as "diminished rhombicosidodecahedron (J76) + pentagonal cupola" (see 4.116, 4.117) joined at the decagonal prism)
cells: 5+5+5+5 trigonal prisms + 5+5+5+5+10 cubes + 1+1+5+5 pentagonal prisms + 2 gyrated rhombicosidodecahedra

4.113 parabigyrated rhombicosidodecahedron || parbigyrated rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: parabigyrated-rhombicosidodecahedral prism
comments: kind of parabigyrated rhombicosidodecahedral-prism (twice: parabigyrated rhombicosidodecahedron (J73) as "parabidiminished rhombicosidodecahedron (J80) + 2 pentagonal cupolae" (see 4.121, 4.117) joined at the decagonal prisms)
cells: 10+10 trigonal prisms + 10+10+10 cubes + 2+10 pentagonal prisms + 2 parabigyrated rhombicosidodecahedra

4.114 metabigyrated rhombicosidodecahedron || metabigyrated rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: metabigyrated-rhombicosidodecahedral prism
comments: kind of metabigyrated rhombicosidodecahedral-prism (twice: metabigyrated rhombicosidodecahedron (J74) as "metabidiminished rhombicosidodecahedron (J81) + 2 pentagonal cupolae" (see 4.122, 4.117) joined at the decagonal prisms)
cells: 2+2+2+2+4+4+4 trigonal prisms + 1+1+2+2+4+4+4+4+4+4 cubes + 2+2+2+2+4 pentagonal prisms + 2 metabigyrated rhombicosidodecahedra

4.115 trigyrated rhombicosidodecahedron || trigyrated rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: trigyrated-rhombicosidodecahedral prism
comments: kind of trigyrated rhombicosidodecahedral-prism (twice: trigyrated

rhombicosidodecahedron (J75) as "tridiminished rhombicosidodecahedron (J83) + 3 pentagonal cupolae" (see xxx, 4.117) joined at the decagonal prisms)
cells: 1+1+3+3+6+6 trigonal prisms + 3+3+3+3+6+6+6 cubes + 3+3+3+3 pentagonal prisms + 2 trigyrated rhombicosidodecahedra

4.116 diminished rhombicosidodecahedron || diminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: diminished-rhombicosidodecahedral prism
comments: kind of diminished rhombicosidodecahedral-prism (twice: diminished rhombicosidodecahedron (J76) as "rhombicosidodecahedron - pentagonal cupola")
cells: 5+5+5 trigonal prisms + 5+5+5+10 cubes + 1+5+5 pentagonal prisms + 1 decagonal prism + 2 diminished rhombicosidodecahedra

4.117 pentagonal cupola || pentagonal cupola

height: 1

4.117.1 pentagonal prism || decagonal prism

height: sqrt((5-sqrt(5))/10) = 0.525731
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: pentagonal-cupolaic prism
comments: kind of diminished rhombicosidodecahedral-prism (twice: pentagonal cupola as "rhombicosidodecahedron - diminished rhombicosidodecahedron (J76)")
cells: 5 trigonal prisms + 5 cubes + 1 pentagonal prism + 1 decagonal prism + 2 pentagonal cupolae

4.118 gyrated paradiminished rhombicosidodecahedron || gyrated paradiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: gyrated-paradiminished-rhombicosidodecahedral prism
comments: kind of diminished gyrated-rhombicosidodecahedral-prism (twice: gyrated paradiminished rhombicosidodecahedron (J77) as "gyrated rhombicosidodecahedron (J72) - pentagonal cupola") -resp.- kind of gyrated diminished-rhombicosidodecahedral-prism (twice: gyrated paradiminished rhombicosidodecahedron (J77) as "parabidiminished rhombicosidodecahedron (J80) + pentagonal cupola" (see 4.121, 4.117) joined at the decagonal prisms)
cells: 5+5+5 trigonal prisms + 5+5+5+10 cubes + 1+5+5 pentagonal prisms + 1 decagonal prism + 2 gyrated paradiminished rhombicosidodecahedra

4.119 gyrated metadiminished rhombicosidodecahedron || gyrated metadiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: gyrated-metadiminished-rhombicosidodecahedral prism
comments: kind of diminished gyrated-rhombicosidodecahedral-prism (twice: gyrated metadiminished rhombicosidodecahedron (J78) as "gyrated rhombicosidodecahedron (J72) - pentagonal cupola") -resp.- kind of gyrated diminished-rhombicosidodecahedral-prism (twice: gyrated metadiminished rhombicosidodecahedron (J78) as "metabidiminished rhombicosidodecahedron (J81) + pentagonal cupola" (see 4.122, 4.117) joined at the decagonal prisms)
cells: 1+1+1+2+2+2+2+2+2 trigonal prisms + 1+1+1+2+2+2+2+2+2+2+2+2+2 cubes + 1+1+1+2+2+2+2 pentagonal prisms + 1 decagonal prism + 2 gyrated metadiminished rhombicosidodecahedra

4.120 bigyrated diminished rhombicosidodecahedron || bigyrated diminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: bigyrated-diminished-rhombicosidodecahedral prism
comments: kind of diminished bigyrated-rhombicosidodecahedral-prism (twice: bigyrated diminished rhombicosidodecahedron (J79) as "metabigyrated rhombicosidodecahedron (J74) - pentagonal cupola") -resp.- kind of gyrated gyrated-metadiminished-rhombicosidodecahedral-prism (twice: bigyrated diminished rhombicosidodecahedron (J79) as "gyrated metabidiminished rhombicosidodecahedron (J82) + pentagonal cupola" (see 4.123, 4.117) joined at the decagonal prism) -resp.- kind of bigyrated diminished-rhombicosidodecahedral-prism (twice bigyrated diminished rhombicosidodecahedron (J79) as "tridiminished rhombicosidodecahedron (J83) + 2 pentagonal cupolaa" (see 4.124, 4.117) joined at the decagonal prisms)
cells: 1+1+1+2+2+2+2+2+2 trigonal prisms + 1+1+1+2+2+2+2+2+2+2+2+2+2 cubes

+ 1+1+1+2+2+2+2 pentagonal prisms + 1 decagonal prism + 2 gyrated bidiminished rhombicosidodecahedra

4.121 parabidiminished rhombicosidodecahedron || parabidiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: parabidiminished-rhombicosidodecahedral prism
comments: kind of parabidiminished rhombicosidodecahedral-prism (twice: parabidiminished rhombicosidodecahedron (J80) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 10 trigonal prisms + 10+10 cubes + 10 pentagonal prisms + 2 decagonal prisms + 2 parabidiminished rhombicosidodecahedra

4.122 metabidiminished rhombicosidodecahedron || metabidiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: metabidiminished-rhombicosidodecahedral prism
comments: kind of metabidiminished rhombicosidodecahedral-prism (twice: metabidiminished rhombicosidodecahedron (J81) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 2+2+2+4 trigonal prisms + 1+1+2+4+4+4+4 cubes + 2+2+2+4 pentagonal prisms + 2 decagonal prisms + 2 metabidiminished rhombicosidodecahedra

4.123 gyrated bidiminished rhombicosidodecahedron || gyrated bidiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: gyrated-bidiminished-rhombicosidodecahedral prism
comments: kind of bidiminished gyrated-rhombicosidodecahedral-prism (twice: gyrated bidiminished rhombicosidodecahedron (J82) as "gyrated rhombicosidodecahedron (J72) - 2 pentagonal cupolae") -resp.- kind of gyrated metabidiminished-rhombicosidodecahedral-prism (twice: gyrated bidiminished rhombicosidodecahedron (J82) as "tridiminished rhombicosidodecahedron (J83) + pentagonal cupola" (see 4.124, 4.117) joined at the decagonal prism)
cells: 1+1+1+1+2+2+2 trigonal prisms + 1+1+1+1+2+2+2+2+2+2+2+2+2 cube + 1+1+1+1+2+2+2 pentagonal prisms + 2 decagonal prisms + 2 gyrated bidiminished rhombicosidodecahedra

4.124 tridiminished rhombicosidodecahedron || tridiminished rhombicosidodecahedron

height: 1
circumradius: sqrt(3+sqrt(5)) = 2.288246
other names: tridiminished-rhombicosidodecahedral prism
comments: kind of tridiminished rhombicosidodecahedral-prism (twice: tridiminished rhombicosidodecahedron (J83) as "rhombicosidodecahedron - 3 pentagonal cupolae")
cells: 1+1+3 trigonal prisms + 3+3+3+6 cubes + 3+3+3 pentagonal prisms + 3 decagonal prisms + 2 tridiminished rhombicosidodecahedra

4.125 truncated cuboctahedron || truncated cuboctahedron

height: 1
circumradius: sqrt((7+3*sqrt(2))/2) = 2.370932
other names: truncated-cuboctahedral prism, great-rhombicosidodecahedral prism
comments: uniform
cells: 12 cubes + 8 hexagonal prisms + 6 octagonal prisms + 2 truncated cuboctahedra

4.126 rhombicosidodecahedron || truncated icosahedron

height: (1+sqrt(5))/4 = 0.809017
circumradius: sqrt((106+41*sqrt(5))/32) = 2.485450
other names: -
cells: 30 trigonal prisms + 12 pentagonal antiprisms + 20 trigonal cupolae + 1 rhombicosidodecahedron + 1 truncated icosahedron

4.127 truncated icosahedron || truncated icosahedron

height: 1
circumradius: sqrt((31+9*sqrt(5))/8) = 2.527959
other names: truncated-icosahedral prism
comments: uniform
cells: 12 pentagonal prisms + 20 hexagonal prisms + 2 truncated dodecahedra

4.128 truncated cube || truncated cuboctahedron

height: 1/sqrt(2) = 0.707107
circumradius: sqrt(4+sqrt(8)) = 2.613126
other names: truncated-cubical monostratic cup of runcinated tesseract, truncated-cubical monostratic cup of runcinated octachoron,

truncated-cubical monostratic cup of prismatorhombated hexadecachoron
cells: 12 trigonal prisms + 8 trigonal cupolae + 6 octagonal prisms + 1 truncated cube + 1 truncated cuboctahedron

4.129 cuboctahedron || truncated cube

height: 1/2
circumradius: sqrt(4+sqrt(8)) = 2.613126
other names: cuboctahedral monostratic cup of cantellated icositetrachoron, cuboctahedral monostratic cup of small rhombated icositetrachoron
cells: 8 trigonal prisms + 1 cuboctahedron + 6 square cupolae + 1 truncated cube

4.130 truncated dodecahedron || truncated dodecahedron

height: 1
circumradius: sqrt((39+15*sqrt(5))/8) = 3.011250
other names: truncated-dodecahedral prism
comments: uniform
cells: 20 trigonal prisms + 12 decagonal prisms + 2 truncated dodecahedra

4.131 icosidodecahedron || rhombicosidodecahedron

height: 1/2
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: icosidodecahedral cupola, second icosahedral monostratic segment of rectified hexacosichoron
cells: 20 octahedra + 30 square pyramids + 12 pentagonal antiprisms + 1 icosidodecahedron + 1 rhombicosidodecahedron

4.132 icosidodecahedron || diminished rhombicosidodecahedron

height: 1/2
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of diminished icosidodecahedral-cupola (icosidodecahedron as "icosidodecahedron - pentagon" and diminished rhombicosidodecahedron (J76) as "rhombicosidodecahedron - pentagonal cupola")
cells: 5+5+5 octahedra + 5+5+5+5+10 square pyramids + 1+5+5 pentagonal antiprisms + 1 icosidodecahedron + 1 diminished rhombicosidodecahedron + 1 pentagonal cupola

4.133 pentagon || gyrated pentagonal cupola

height: 1/2
shear: sqrt((5+2*sqrt(5))/5) = 1.376382

4.133.1 decagon || pentagonal antiprism

height: (sqrt(5)-1)/4 = 0.309017
shear: 0
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of diminished icosidodecahedral-cupola (pentagon as "icosidodecahedron - icosidodecahedron" and pentagonal cupola as "rhombicosidodecahedron - diminished rhombicosidodecahedron") -resp.- kind of bidiminished icosahedral-cupola (decagon as "icosidodecahedra - 2 rotunda" and pentagonal antiprism as "icosahedron - 2 pentagonal pyramids")
cells: 10 square pyramids + 1 pentagonal antiprism + 2 pentagonal cupolae

4.134 icosidodecahedron || parabidiminished rhombicosidodecahedron

height: 1/2
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosidodecahedral-cupola (icosidodecahedron as "icosidodecahedron - 2 pentagons" and parabidiminished rhombicosidodecahedron (J80) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 10 octahedra + 10+10+10 square pyramids + 10 pentagonal antiprisms + 1 icosidodecahedron + 2 pentagonal cupolae + 1 parabidiminished rhombicosidodecahedron

4.135 icosidodecahedron || metabidiminished rhombicosidodecahedron

height: 1/2
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosidodecahedral-cupola (icosidodecahedron as "icosidodecahedron - 2 pentagons" and metabidiminished rhombicosidodecahedron (J81) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 2+2+2+4 octahedra + 1+1+2+2+4+4+4+4+4+4 square pyramids + 2+2+2+4 pentagonal antiprisms + 1 icosidodecahedron + 2 pentagonal cupolae + 1 metabidiminished rhombicosidodecahedron

4.136 icosidodecahedron || tridiminished rhombicosidodecahedron

height: 1/2
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of tridiminished icosidodecahedral-cupola (icosidodecahedron as "icosidodecahedron - 3 pentagons" and tridiminished rhombicosidodecahedron (J83) as "rhombicosidodecahedron - 3 pentagonal cupolae")
cells: 1+1+3 octahedra + 3+3+3+3+6+6+6 square pyramids + 3+3+3 pentagonal antiprisms + 1 icosidodecahedron + 3 pentagonal cupolae + 1 tridiminished rhombicosidodecahedron

4.137 icosahedron || icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: icosahedral cupola, icosahedral monostratic cup of rectified hexacosichoron
cells: 20 octahedra + 1 icosahedron + 12 pentagonal pyramids + 1 icosidodecahedron

4.138 gyroelongated pentagonal pyramid || icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of diminished icosahedral-cupola (gyroelongated pentagonal pyramid (J11) as "icosahedron - pentagonal pyramid" and icosidodecahedron as "icosidodecahedron - pentagon")
cells: 5+5+5 octahedra + 5 square pyramids + 1 gyroelongated pentagonal pyramid + 1+5+5 pentagonal pyramids + 1 pentagonal prism + 1 icosidodecahedron

4.139 pentagonal pyramid || rotunda

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of diminished icosahedral-cupola (pentagonal pyramid as "icosahedron - gyroelongated pentagonal pyramid (J11)" and rotunda as "icosidodecahedron - rotunda")
cells: 5 octahedra + 5 square pyramids + 1+1+5 pentagonal pyramids + 1 rotunda + 1 pentagonal cupola

4.140 gyroelongated pentagonal pyramid || rotunda

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of diminished icosahedral-cupola (gyroelongated pentagonal pyramid (J11) as "icosahedron - pentagonal pyramid" and rotunda as "icosidodecahedron - rotunda")
cells: 5+5 octahedra + 5 square pyramids + 1 gyroelongated pentagonal pyramid + 1+5 pentagonal pyramids + 1 rotunda + 1 pentagonal cupola

4.141 pentagon || pentagonal pyramid

height: (sqrt(5)-1)/4 = 0.309017
shear: sqrt((5+2*sqrt(5))/5) = 1.376382

4.141.1 point || pentagonal prism

height: sqrt((5-2*sqrt(5))/20) = 0.162460
shear: 0
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: pentagonal-prismatic pyramid, pentagonal pentagonal-pyramidal wedge
comments: kind of diminished icosahedral cupola (pentagonal pyramid as "icosahedron - gyroelongated pentagonal pyramid (J11)" and pentagon as "icosidodecahedron - icosidodecahedron")
cells: 5 square pyramids + 2 pentagonal pyramids + 1 pentagonal prism

4.142 pentagonal antiprism || icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosahedral-cupola (pentagonal antiprism as "icosahedron - 2 pentagonal pyramids" and icosidodecahedron as "icosidodecahedron - 2 pentagons")
cells: 10 octahedra + 10 square pyramids + 10 pentagonal pyramids + 1 pentagonal antiprism + 2 pentagonal prisms + 1 icosidodecahedron

4.143 metabidiminished icosahedron || icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosahedral-cupola (metabidiminished icosahedron (J62) as "icosahedron - 2 pentagonal pyramids" and icosidodecahedron as "icosidodecahedron - 2 pentagons")
cells: 2+2+2+4 octahedra + 2+4+4 square pyramids + 2+2+2+4 pentagonal pyramids + 1 metabidiminished icosahedron + 1 pentagonal prism + 1 icosidodecahedron

4.144 pentagonal antiprism || rotunda

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosahedral-cupola (pentagonal antiprism as "icosahedron - 2 pentagonal pyramids" and rotunda as "icosidodecahedron - rotunda - pentagon")
cells: 5 octahedra + 5+5 square pyramids + 5 pentagonal pyramids + 1 pentagonal antiprism + 1 pentagonal prism + 1 rotunda + 1 pentagonal cupola

4.145 metabidiminished icosahedron || rotunda

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of bidiminished icosahedral-cupola (metabidiminished icosahedron (J62) as "icosahedron - 2 pentagonal pyramids" and rotunda as "icosidodecahedron - rotunda - pentagon")
cells: 1+1+2+2 octahedra + 2+2+2+2 square pyramids + 1+2+2 pentagonal pyramids + 1 metabidiminished icosahedron + 1 pentagonal prism + 1 rotunda + 1 pentagonal cupola

4.146 pentagon || rotunda

height: (sqrt(5)-1)/4 = 0.309017
shear: sqrt((5+sqrt(5))/40) = 0.425325
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: pentagonal rotundaic wedge
comments: kind of bidiminished icosahedral-cupola (pentagon as "icosahedron - gyroelongated pentagonal pyramid - pentagonal pyramid" and rotunda as "icosidodecahedron - rotunda - pentagon")
cells: 5+5 square pyramids + 5 pentagonal pyramids + 1 pentagonal prism + 1 rotunda + 1 pentagonal cupola

4.147 tridiminished icosahedron || icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of tridiminished icosahedral-cupola (tridiminished icosahedron (J63) as "icosahedron - 3 pentagonal pyramids" and icosidodecahedron as "icosidodecahedron - 3 pentagons")
cells: 1+1+3 octahedra + 3+6+6 square pyramids + 3+3+3 pentagonal pyramids + 1 tridiminished icosahedron + 3 pentagonal prisms + 1 icosidodecahedron

4.148 tridiminished icosahedron || rotunda

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(5+2*sqrt(5)) = 3.077684
other names: -
comments: kind of tridiminished icosahedral-cupola (tridiminished icosahedron (J63) as "icosahedron - 3 pentagonal pyramids" and rotunda as "icosidodecahedron - rotunda - 2 pentagons")
cells: 1+1 octahedra + 1+2+2+2+2+2 square pyramids + 1+1+2 pentagonal pyramids + 1 tridiminished icosahedron + 2 pentagonal prisms + 1 rotunda + 1 pentagonal cupola

4.149 truncated octahedron || truncated cuboctahedron

height: 1/2
circumradius: sqrt(8+3*sqrt(2)) = 3.498949
other names: truncated-octahedral monostratic cup of runcitruncated icositetrachoron, truncated-octahedral monostratic cup of prismatorhombated icositetrachoron
cells: 12 trigonal prisms + 8 hexagonal prisms + 6 square cupolae + 1 truncated octahedron + 1 truncated cuboctahedron

4.150 truncated icosidodecahedron || truncated icosidodecahedron

height: 1
circumradius: sqrt(8+3*sqrt(5)) = 3.835128
other names: truncated-icosidodecahedral prism, great-rhombicosidodecahedral prism
comments: uniform
cells: 30 cubes + 20 hexagonal prisms + 12 decagonal prisms + 2 truncated icosidodecahedra

4.151 truncated icosahedron || truncated dodecahedron

height: 1/2
circumradius: sqrt(8+3*sqrt(5)) = 3.835128
other names: -
cells: 30 tetrahedra + 20 trigonal cupolae + 12 pentagonal cupolae + 1 truncated icosahedron + 1 truncated dodecahedron

4.152 dodecahedron || rhombicosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: 3+sqrt(5) = 5.236068
other names: dodecahedral monostratic cup of runcinated hecatonicosachoron, dodecahedral monostratic cup of runcinated hexacosichoron, dodecahedral monostratic cup of small diprismatohexacosihecatonicosachoron
cells: 20 tetrahedra + 30 trigonal prisms + 12 pentagonal prisms + 1 dodecahedron + 1 rhombicosidodecahedron

4.153 dodecahedron || diminished rhombicosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: 3+sqrt(5) = 5.236068
other names: -
comments: kind of diminished dodecahedronal-monostratic-cup-of-runcinated-hecatonicosachoron (dodecahedron as "dodecahedron - pentagon" and diminished rhombicosidodecahedron (J76) as "rhombicosidodecahedron - pentagonal cupola")
cells: 5+5+5 tetrahedra + 5+5+5+10 trigonal prisms + 1+5+5+5 pentagonal prisms + 1 dodecahedron + 1 diminished rhombicosidodecahedron + 1 pentagonal cupola

4.154 pentagon || pentagonal cupola

height: (sqrt(5)-1)/4 = 0.309017
shear: sqrt((25+11*sqrt(5))/40) = 1.113516

4.154.1 decagon || pentagonal prism

height: sqrt((5-2*sqrt(5))/20) = 0.162460
shear: 0
circumradius: 3+sqrt(5) = 5.236068
other names: pentagonal pentagonal-cupolaic wedge
comments: kind of diminished dodecahedronal-monostratic-cup-of-runcinated-hecatonicosachoron (pentagon as "dodecahedron - dodecahedron" and pentagonal cupola as "rhombicosidodecahedron - diminished rhombicosidodecahedron (J76)")
cells: 5 tetrahedra + 5 trigonal prisms + 1 pentagonal prism + 2 pentagonal cupolae

4.155 dodecahedron || parabidiminished rhombicosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: 3+sqrt(5) = 5.236068
other names: -
comments: kind of bidiminished dodecahedronal-monostratic-cup-of-runcinated-hecatonicosachoron (dodecahedron as "dodecahedron - 2 pentagons" and parabidiminished rhombicosidodecahedron (J80) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 10 tetrahedra + 10+10 trigonal prisms + 10 pentagonal prisms + 1 dodecahedron + 2 pentagonal cupolae + 1 parabidiminished rhombicosidodecahedron

4.156 dodecahedron || metabidiminished rhombicosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: 3+sqrt(5) = 5.236068
other names: -
comments: kind of bidiminished dodecahedronal-monostratic-cup-of-runcinated-hecatonicosachoron (dodecahedron as "dodecahedron - 2 pentagons" and metabidiminished rhombicosidodecahedron (J81) as "rhombicosidodecahedron - 2 pentagonal cupolae")
cells: 2+2+2+4 tetrahedra + 1+1+2+4+4+4+4 trigonal prisms + 2+2+2+4 pentagonal prisms + 1 dodecahedron + 2 pentagonal cupolae + 1 metabidiminished rhombicosidodecahedron

4.157 dodecahedron || tridiminished rhombicosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: 3+sqrt(5) = 5.236068
other names: -
comments: kind of tridiminished dodecahedronal-monostratic-cup-of-runcinated-hecatonicosachoron (dodecahedron as "dodecahedron - 3 pentagons" and tridiminished rhombicosidodecahedron (J83) as "rhombicosidodecahedron - 3 pentagonal cupolae")
cells: 1+1+3 tetrahedra + 3+3+3+6 trigonal prisms + 3+3+3 pentagonal prisms + 1 dodecahedron + 3 pentagonal cupolae + 1 tridiminished rhombicosidodecahedron

4.158 icosidodecahedron || truncated icosahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(19+8*sqrt(5)) = 6.073594
other names: icosidodecahedral monostratic cup of cantellated hexacosichoron, icosidodecahedral monostratic cup of small rhombated hexacosichoron
cells: 12 pentagonal prisms + 20 trigonal cupolae + 1 icosidodecahedron + 1 truncated icosahedron

4.159 rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: rhombicosidodecahedral monostratic cup of cantellated hecatonicosachoron, rhombicosidodecahedral monostratic cup of small rhombated hecatonicosachoron
cells: 20 octahedra + 30 trigonal prisms + 1 rhombicosidodecahedron + 12 pentagonal cupolae + 1 truncated dodecahedron

4.160 gyrated rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of gyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated rhombicosidodecahedron (J72) as "diminished rhombicosidodecahedron (J76) + pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron + decagon" (see 4.164, 4.165) joining at the decagonal prism)
cells: 5+5+5 octahedra + 5+5 square pyramids + 5+5+5+5+10 trigonal prisms + 1 gyrated rhombicosidodecahedron + 1+1+5+5 pentagonal cupolae + 1 truncated dodecahedron

4.161 parabigyrated rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of bigyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (parabigyrated rhombicosidodecahedron (J73) as "parabidiminished rhombicosidodecahedron (J80) + 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron + 2 decagons" (see 4.169, 4.165) joining at the decagonal prism)
cells: 10 octahedra + 10+10 square pyramids + 10+10+10 trigonal prisms + 1 parabigyrated rhombicosidodecahedron + 2+10 pentagonal cupolae + 1 truncated dodecahedron

4.162 metabigyrated rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of bigyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (metabigyrated rhombicosidodecahedron (J74) as "metabidiminished rhombicosidodecahedron (J81) + 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron + 2 decagons" (see 4.170, 4.165) joining at the decagonal prism)
cells: 2+2+2+4 octahedra + 2+2+4+4+4+4 square pyramids + 1+1+2+2+4+4+4+4+4+4 trigonal prisms + 1 metabigyrated rhombicosidodecahedron + 2+2+2+2+4 pentagonal cupolae + 1 truncated dodecahedron

4.163 trigyrated rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of trigyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (trigyrated rhombicosidodecahedron (J75) as "tridiminished rhombicosidodecahedron (J83) + 3 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron + 3 decagons" (see 4.172, 4.165) joining at the decagonal prism)
cells: 1+1+3 octahedra + 3+3+6+6+6+6 square pyramids + 3+3+3+3+6+6+6 trigonal prisms + 1 trigyrated rhombicosidodecahedron + 3+3+3+3 pentagonal cupolae + 1 truncated dodecahedron

4.164 diminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of diminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (diminished rhombicosidodecahedron (J76) as "rhombicosidodecahedron - pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron - decagon")
cells: 5+5+5 octahedra + 5 square pyramids + 5+5+5+10 trigonal prisms + 1 decagonal prism + 1 diminished rhombicosidodecahedron + 1+5+5 pentagonal cupolae + 1 truncated dodecahedron

4.165 decagon || pentagonal cupola

height: (sqrt(5)-1)/4 = 0.309017
shear: sqrt((25+11*sqrt(5))/8) = 2.489893

4.165.1 pentagon || decagonal prism

height: sqrt((5-2*sqrt(5))/20) = 0.162460
shear: 0
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: decagonal pentagonal-cupolaic wedge
comments: kind of diminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (pentagonal cupola as "rhombicosidodecahedron - diminished rhombicosidodecahedron (J76)" and decagon as "truncated dodecahedron - truncated dodecahedron")
cells: 5 square pyramids + 5 trigonal prisms + 1 decagonal prism + 2 pentagonal cupolae

4.166 gyrated paradiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of gyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated paradiminished rhombicosidodecahedron (J77) as "parabidiminished rhombicosidodecahedron (J80) + pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron + decagon" (see 4.169, 4.165) joining at a decagonal prism) -resp.- kind of diminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated paradiminished rhombicosidodecahedron (J77) as "gyrated rhombicosidodecahedron (J72) - pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron - decagon")
cells: 5+5 octahedra + 5+5+5 square pyramids + 5+5+5+10 trigonal prisms + 1+1+5 pentagonal cupolae + 1 gyrated paradiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.167 gyrated metadiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of gyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated metadiminished rhombicosidodecahedron (J78) as "metabidiminished rhombicosidodecahedron (J81) + pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron + decagon" (see 4.170, 4.165) joining at a decagonal prism) -resp.- kind of diminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated metadiminished rhombicosidodecahedron (J78) as "gyrated rhombicosidodecahedron (J72) - pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron - decagon")
cells: 1+1+2+2+2+2 octahedra + 1+1+1+2+2+2+2+2+2 square pyramids + 1+1+1+2+2+2+2+2+2+2+2+2+2 trigonal prisms + 1+1+1+2+2+2+2 pentagonal cupolae + 1 gyrated metadiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.168 bigyrated diminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of bigyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (bigyrated diminished rhombicosidodecahedron (J79) as "tridiminished rhombicosidodecahedron (J83) + 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron + 2 decagons" (see 4.172, 4.165) joining at decagonal prisms) -resp.- kind of diminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (bigyrated diminished rhombicosidodecahedron (J79) as "metabigyrated rhombicosidodecahedron (J74) - pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron - decagon")
cells: 1+1+1+2 octahedra + 1+2+2+2+2+2+2+2+2+2+2+2+2 square pyramids + 1+1+1+2+2+2+2+2+2+2+2+2+2+2 trigonal prisms + 1+1+1+2+2+2+2 pentagonal cupolae + 1 bigyrated diminished rhombicosidodecahedron + 1 truncated dodecahedron

4.169 parabidiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of bidiminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (parabidiminished rhombicosidodecahedron (J80) as "rhombicosidodecahedron - 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron - 2 decagons")
cells: 10 octahedra + 10 square pyramids + 10+10 trigonal prisms + 2 decagonal prisms + 10 pentagonal cupolae + 1 parabidiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.170 metabidiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of bidiminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (metabidiminished rhombicosidodecahedron (J81) as "rhombicosidodecahedron - 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron - 2 decagons")
cells: 2+2+2+4 octahedra + 2+4+4 square pyramids + 1+1+2+4+4+4+4 trigonal prisms + 2 decagonal prisms + 2+2+2+4 pentagonal cupolae + 1 metabidiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.171 gyrated bidiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of gyrated rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated bidiminished rhombicosidodecahedron (J82) as "tridiminished rhombicosidodecahedron (J83) + pentagonal cupola" and truncated dodecahedron as "truncated dodecahedron + decagon" (see 4.172, 4.165) joining at a decagonal prism) -resp.- kind of bidiminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (gyrated bidiminished rhombicosidodecahedron (J82) as "gyrated rhombicosidodecahedron (J72) - 2 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron - 2 decagons")
cells: 1+1+1+2 octahedra + 1+1+2+2+2+2+2+2+2+2+2 square pyramids + 1+1+1+2+2+2+2+2+2+2+2+2+2+2 trigonal prisms + 2 decagonal prisms + 1+1+1+1+2+2+2 pentagonal cupolae + 1 gyrated bidiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.172 tridiminished rhombicosidodecahedron || truncated dodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(23+10*sqrt(5)) = 6.735034
other names: -
comments: kind of tridiminished rhombicosidodecahedral-monostratic-cup-of-cantellated-hecatonicosachoron (tridiminished rhombicosidodecahedron (J83) as "rhombicosidodecahedron - 3 pentagonal cupolae" and truncated dodecahedron as "truncated dodecahedron - 3 decagons")
cells: 1+1+3 octahedra + 3+3+6 square pyramids + 3+3+3+6 trigonal prisms + 3 decagonal prisms + 3+3+3 pentagonal cupolae + 1 tridiminished rhombicosidodecahedron + 1 truncated dodecahedron

4.173 truncated dodecahedron || truncated icosidodecahedron

height: (sqrt(5)-1)/4 = 0.309017
circumradius: sqrt(48+21*sqrt(5)) = 9.744610
other names: truncated-dodecahedral monostratic cup of runcitruncated hecatonicosachoron, truncated-dodecahedral monostratic cup of prismatorhombated hexacosichoron
cells: 30 trigonal prisms + 20 trigonal cupolae + 12 decagonal prisms + 1 truncated dodecahedron + 1 truncated icosidodecahedron

4.174 n-gon || n-antiprism (n =/= 2, 3, 4, 5, 6, 8, 10)

height:
sqrt((1+3*cos(pi/n))/(2+4*cos(pi/n)))
shear:
1/sqrt(8+24*cos(pi/n)+16*cos^2(pi/n))

4.174.1 n-gon || gyrated n-prism (n =/= 3, 4, 5, 6, 8, 10)

height:
sqrt((1+3*cos(pi/n))/(4+4*cos(pi/n)))
shear: 0
circumradius: sqrt((1+2*cos(pi/n)-2*cos^2(pi/n))/(2+4*cos(pi/n)-6*cos^2(pi/n)))
other names: general n-gonal n-antiprismatic wedge
cells: n tetrahedra + n square pyramids + 2 n-antiprisms + 1 n-prism

4.175 n-gon || n-prism (n =/= 3, 4, 5, 6, 8, 10)

height: sqrt(3/4) = 0.866025
shear: 0
circumradius: sqrt((4+3*csc^2(pi/n))/12)
other names: trigon- n-gon -diprism, direct sum of trigon and n-gon, n-gonal n-prismatic wedge
comments: uniform
cells: n trigonal prisms + 3 n-gonal prisms

4.176 n-gonal antiprism || n-gonal antiprism (n =/= 2, 3, 4, 5, 6, 8, 10)

height: 1

4.176.1 n-gonal prism || gyrated n-gonal prism (n =/= 3, 4, 5, 6, 8, 10)

height:
sqrt((1+2*cos(pi/n))/(2+2*cos(pi/n)))
circumradius: sqrt((5-4*cos(pi/n))/(8-8*cos(pi/n)))
other names: general n-gonal-antiprismatic prism
comments: uniform
cells: 2n trigonal prisms + 2 n-gonal antiprisms + 2 n-gonal prisms

4.177 n-gonal prism || n-gonal prism (n =/= 3, 4, 5, 6, 8, 10)

height: 1
circumradius: sqrt(2+csc^2(pi/n))/2
other names: general n-gonal-prismatic prism, square- n-gon -diprism, direct sum of square and n-gon
comments: uniform
cells: n cubes + 4 n-gonal prisms

5 Index

abriv.	Name
line	line segment
10g	decagon
3g	trigon
4g	square, tetragon
5g	pentagon
6g	hexagon
8g	octagon
n-g	general n-gon
10ap	decagonal antiprism
10p	decagonal prism
2ap	see tet
2cup	see 3p
3ap	see oct
3cup	trigonal cupola, J3 half of cuboctahedron
3p	trigonal prism, digonal cupola, square wedge
3pyr	see tet
4ap	square antiprism
4cup	square cupola, J4, kind of diminished rhombicuboctahedron
4p	cube, hexahedron, square prism
4pyr	square pyramid, J1, trigonal wedge
5ap	pentagonal antiprism, parabidiminished icosahedron
5cup	pentagonal cupola, kind of diminished rhombicosidodecahedron
5p	pentagonal prism
5pyr	pentagonal pyramid, J2, kind of diminished icosahedron
6ap	hexagonal antiprism
6p	hexagonal prism
8ap	octagonal antiprism
8p	octagonal prism, prabidimnishd rhombicuoctahedron
co	cuboctahedrn, rhombitetratetrahedron
cube	see 4p
doe	dodcaedron
girco	truncated cuboctahedron, great rhomicuboctahedron
grid	truncated icosidodecahedron, great rhombicoidoecahedron
id	icosidodecahedron
ike	icosahdron, snub tetratetrahedron
J1	see 4pyr
J11	gyroelongated pentagonal pyramid, kind of diminished icosahedron
J19	elongated square cupola, kind of diminishd rhombicuboctahedron
J2	see 5pyr
J27	trigonal orthobicupola, gyrated

abriv.	Name
	cuboctahedron
J3	see 3cup
J34	orthobirotunda, gyrated icosidodecahedron
J37	elongated square gyrobicupola, gyrated rhombicuboctahedron
J4	see 4cup
J5	see 5cup
J6	rotunda, half of icosidodecahedron
J62	metabidiminished icosahedron
J63	tridiminished icosahedron
J72	gyrated rhombicosidodecahedron
J73	parabigyrated rhombicosidodecahedron
J74	metabigyrated rhombicosidodecahedron
J75	trigyrated rhombicosidodecahedron
J76	diminished rhombicosidodecahedron
J77	gyrated paradiminished rhombicosidodecahedron
J78	gyrated metadiminished rhombicosidodecahedron
J79	bigyrated diminished rhobicosidodecahedron
J80	parabidiminished rhombicosidodecahedron
J81	metabidiminished rhombicosidodecahedron
J82	gyrated bidiminished rhobicosidodecahedron
J83	tridiminished rhombicosidodecahedron
n-ap	general n-gonal aniprism
n-p	general n-gonal prism
oct	octahedron, trigonal antiprism, tetratetrahedon
rot	see J6
sirco	(small) rhombicuboctahedron
snic	snub cube, snub cuboctahedron
snid	snub dodecahedron, snub icosidodecahedron
square	see 4g
srid	(small) rhomicosidodecahedron
tet	tetrahedron
ti	truncated icosahedron
tic	truncated cube
tid	truncated dodecahedron
toe	truncated octahedron
trig	see 3g
tut	truncated tetrahedron
dip	diprism, duoprism
hex	hexadecachoron
ico	icositetrachoron

abriv.	Name
pen	pentachoron
prico	runcitruncated icositetrachoron, prismatorhombated icositetrachoron
prip	runcitruncated pentachoron, prismatorhombated pentachoron
prix	runcitruncated hecatonicosachoron, prismatorhombated hexacosichoron
proh	runcitruncated tesseract, runcitruncated octachoron, prismtorhombated hexadecachoron
rap	rectified pentachoron
rico	rectifed icositetrachoron
rit	rectified tesseract, rectified octachoron
rox	rectified hexacosichoron
sidpith	runcinated tesseract, runcinated octachoron, runcinated hexadecachoron, small diprismatotesseractihexadecachoron
sidpixhi	runcinated hecatonicosachoron, runcinated hexacosichoron, small diprismatohexacosihecatonicosachoron
spic	runcinated icositetrachoron, small prismatotetracontaoctachoron
spid	runcinated pentachoron,(small) prismatodecachoron
srahi	cantellated hecatonicosachoron, small rhombated hecatonicosachoron
srico	cantellated icositetrachoron, small rhombated icositetrachoron
srip	cantellated pentachoron, small rhombated pentachoron, (small) prismatodispentachoron
srit	cantellated tesseract, cantellated octachoron, small rhombated tesseract
srix	cantellated hexacosichoron, small rhombated hexacosichoron
tes	tesseract, octachoron

Table 3: some abreviations for facets and polychora

This index references to the list, again using the form "x || y", but this time it uses abreviations for the top and bottom facets (essentially the numbers of the Johnson solids respectively most of the shortnames introduced by J. Bowers, see Table 3). Further this listing is completely lexicographic.

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10g || 5cup	4.165
10g || 5g	3.18
10g || 5p	4.154.1
10g || dual 10g	3.16
10g || gyro 10p	4.93.1
10p || 10p	4.97
10p || 5g	4.165.1
10p || 5p	4.117.1
10p || gyro 10p	4.96.1
3cup || 3cup	4.45
3cup || 3g	4.24
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3cup || 6g	4.51
3cup || gyro 3g	4.27
3cup || oct	4.30
3cup || tet	4.24
3cup || tut	4.50
3g || 3g	3.4
3g || 3p	4.10
3g || 4pyr	4.8
3g || 6g	3.10
3g || 6p	4.51.1
3g || dual 3g	3.2
3g || gyro 3p	4.6.2
3g || gyro tet	4.3.1
3g || incl 3g	4.4.2
3g || J63	4.33
3g || line	3.3
3g || oct	4.6.1
3g || ortho 4g	4.7.3
3g || perp line	4.1.1
3g || point	3.1
3g || tet	4.7.1
3p || 3p	4.18
3p || 4g	4.12.1
3p || 6g	4.25.1
3p || 6p	4.45.1
3p || gyro 3p	4.11.1
3p || ortho line	4.8.2
3p || para line	4.9.1
3p || point	4.7.2
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4ap || 4g	4.14
4ap || 8g	4.64.1
4ap || point	4.17.1
4cup || 4cup	4.69
4cup || 4pyr	4.109
4cup || 4g	4.73
4cup || 8g	4.105
4cup || gyro 4g	4.64
4g || 4g	3.6
4g || 4p	4.18.1
4g || 4pyr	4.26
4g || 8g	3.15
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4g || gyro 4pyr	4.17
4g || gyro 4p	4.14.1
4g || line	3.4.1
4g || ortho 4g	4.9.2
4g || perp line	4.4.3
4g || point	3.3
4g || tet	4.8.1
4p || 4p	4.20
4p || 8g	4.73.1
4p || 8p	4.69.1
4p || co	4.35
4p || gyro 4p	4.19.1
4p || gyro 4pyr	4.16
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5cup || gyro 5g	4.133
5g || 5g	3.9
5g || 5p	4.34
5g || 5pyr	4.141
5g || dual 5g	3.7
5g || gyro 5p	4.22.1
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5g || J6	4.146
5g || perp line	4.86.1
5g || point	3.8
5p || 5p	4.42
5p || gyro 5p	4.39.1
5p || line	4.38.1
5p || point	4.141.1
5pyr || 5pyr	4.38
5pyr || J6	4.139
5pyr || point	4.86
6ap || 6ap	4.53
6ap || 6g	4.46
6g || 6g	3.12
6g || 6p	4.47
6g || dual 6g	3.11
6g || gyro 6p	4.46.1
6g || oct	4.27.1
6p || 6p	4.54
6p || gyro 6p	4.53.1
8ap || 8ap	4.65
8ap || 8g	4.58
8g || 8g	3.14
8g || 8p	4.59
8g || dual 8g	3.13
8g || gyro 8p	4.58.1
8p || 8p	4.70
8p || co	4.63
8p || gyro 8p	4.65.1
8p || tic	4.106
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co || oct	4.29
co || sirco	4.61
co || tet	4.23
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co || tut	4.48
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line || point	2.1
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n-ap || n-g	4.174
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n-g || n-g	3.20
n-g || n-p	4.175
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n-p || n-p	4.177
oct || oct	4.11
oct || point	4.3
oct || sirco	4.107
oct || tet	4.5
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sirco || gyro tic	4.102
sirco || sirco	4.66
sirco || tic	4.100
sirco || toe	4.75
snic || snic	4.60
snid || snid	4.110
srid || srid	4.111
srid || ti	4.126
srid || tid	4.159
tet || dual tet	4.2
tet || tet	4.9
tet || tut	4.56
ti || ti	4.127
ti || tid	4.151
tic || tic	4.99
tic || toe	4.98
tid || tid	4.130
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tut || tut	4.57