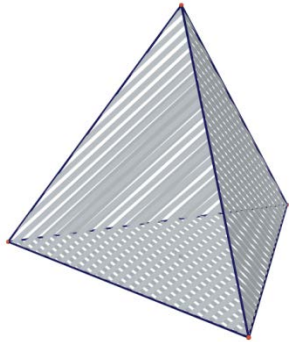
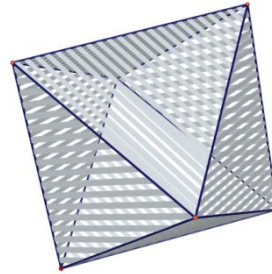


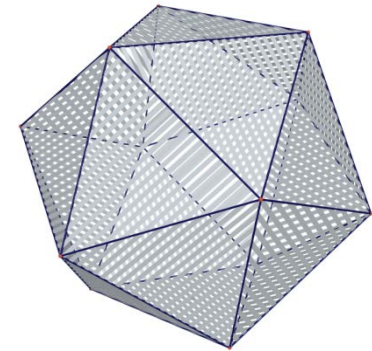
# Pravidelné konvexní mnohostěny – Platónská tělesa



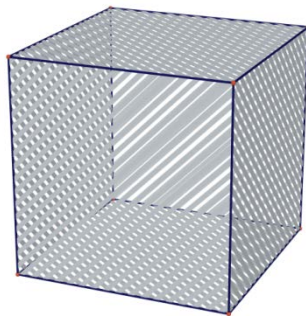
čtyřstěn (tetraedr)



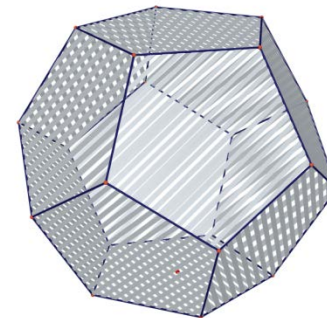
osmistěn (oktaedr)



dvacetistěn (ikosaedr)

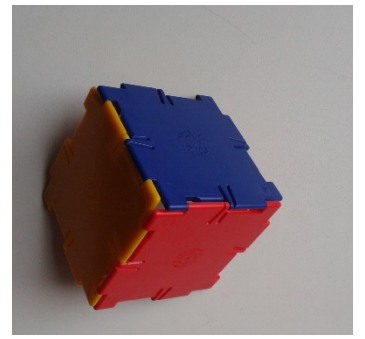
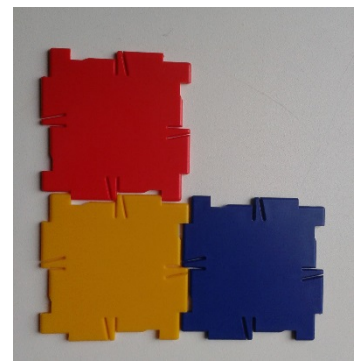


krychle (hexaedr)

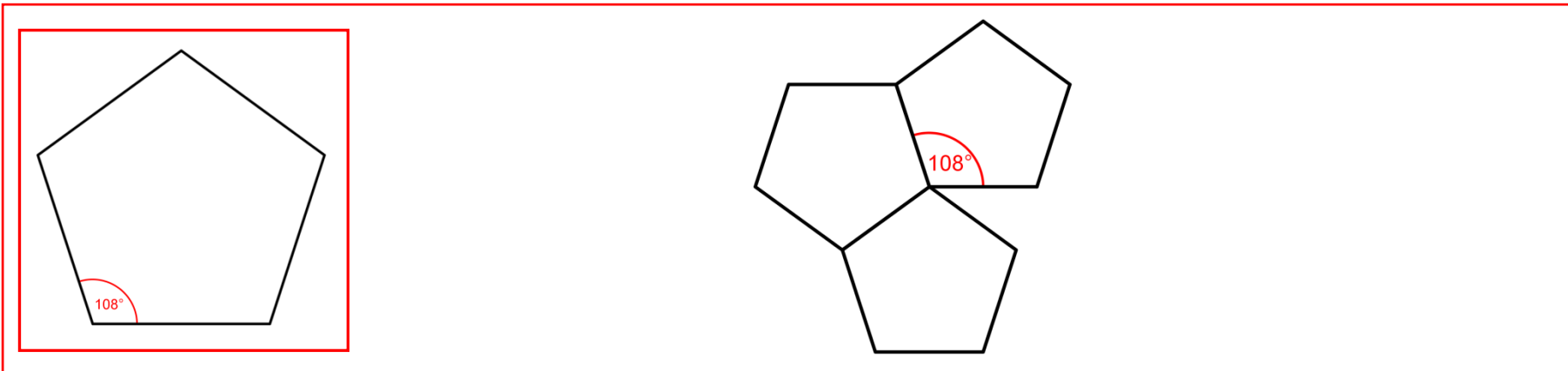
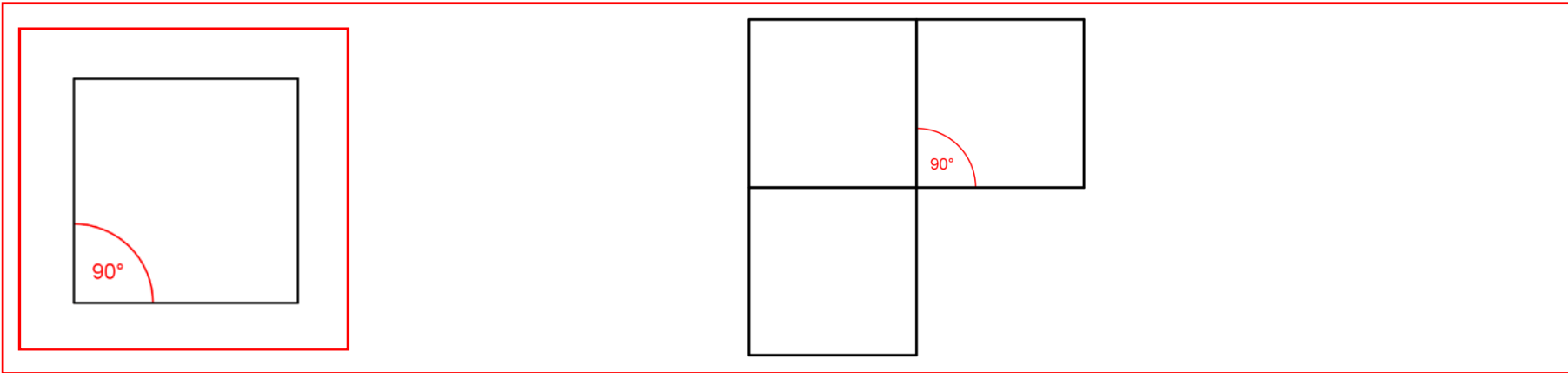
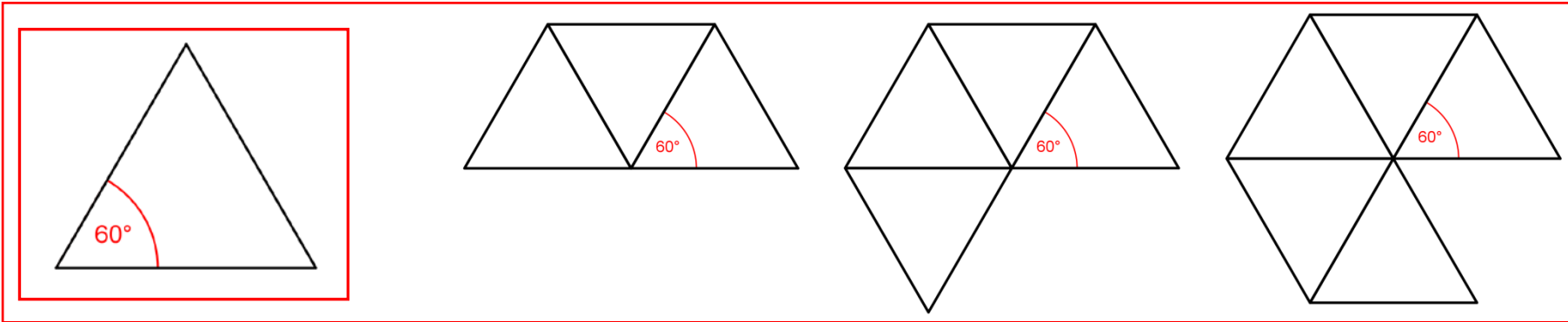


dvanáctistěn (dodekaedr)

# Pravidelné konvexní mnohostěny – Platónská tělesa



# Počet pravidelných konvexních mnohostrannů

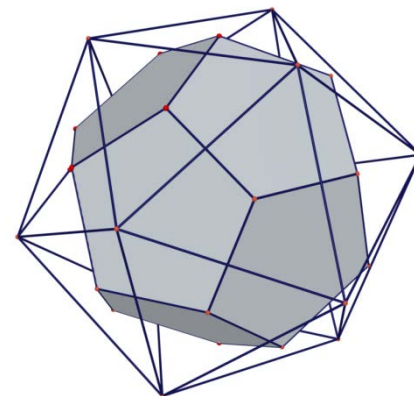
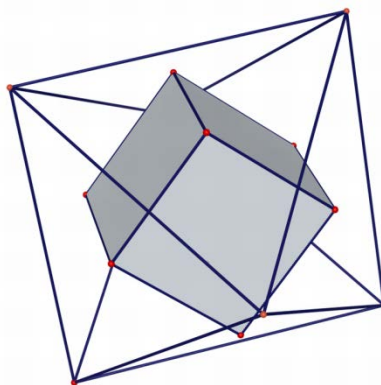
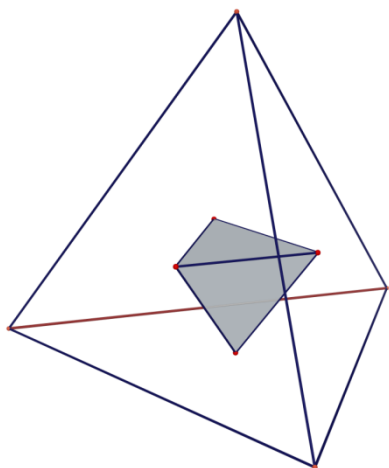


# Eulerův vztah

$$s + v - h = 2$$

MNOHOSTĚN	STĚNY (s)	VRCHOLY (v)	HRANY (h)
čtyřstěn (tetraedr)	4	4	6
krychle (hexaedr)	6	8	12
osmistěn (oktaedr)	8	6	12
dvanáctistěn (dodekaedr)	12	20	30
dvacetistěn (ikosaedr)	20	12	30

## Duální mnohostěny

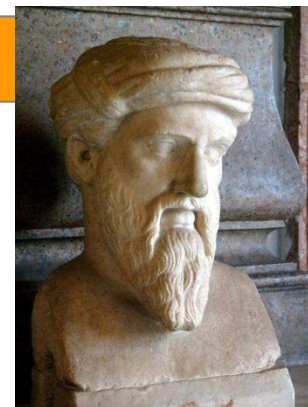


## Pythagoras ze Samu (570 – 495 př.n.l.)

Pythagorova škola – Pythagorovci

Není jisté, zda znali všechny pravidelné mnohostěny.

<http://en.wikipedia.org/wiki/Pythagoras>



### Hyppasus (5. stol. př. n. l.)

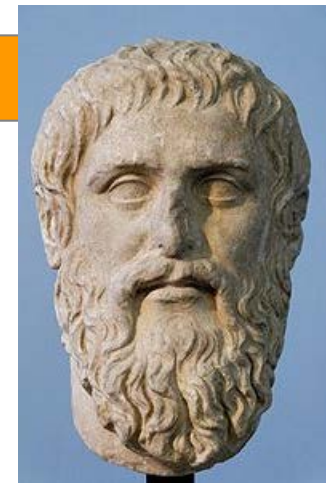
člen Pythagorovců

dvě verze jeho smrti utopením – objevení iracionálních čísel nebo vepsání dvanáctistěnu kouli

<http://en.wikipedia.org/wiki/Hippasus>

## Platón (424/423 – 348/347 př.n.l.)

MNOHOSTĚN	s	v	h	elementem
čtyřstěn (tetraedr)	4	4	6	OHEŇ
krychle (hexaedr)	6	8	12	ZEMĚ
osmistěn (oktaedr)	8	6	12	VZDUCH
dvacetistěn (ikosaedr)	20	12	30	VODA
dvanáctistěn (dodekaedr)	12	20	30	VESMÍR

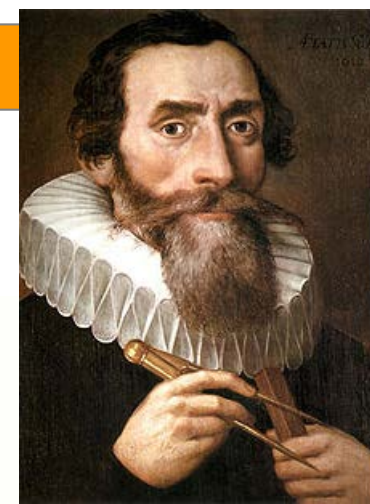


<http://en.wikipedia.org/wiki/Plato>, [http://en.wikipedia.org/wiki/Platonic\\_solid](http://en.wikipedia.org/wiki/Platonic_solid)

**Theaetetus (417 – 369 př.n.l.)** - matematický popis pravidelných mnohostěnů. První důkaz, že jich je právě pět.

[http://en.wikipedia.org/wiki/Theaetetus\\_%28mathematician%29](http://en.wikipedia.org/wiki/Theaetetus_%28mathematician%29)

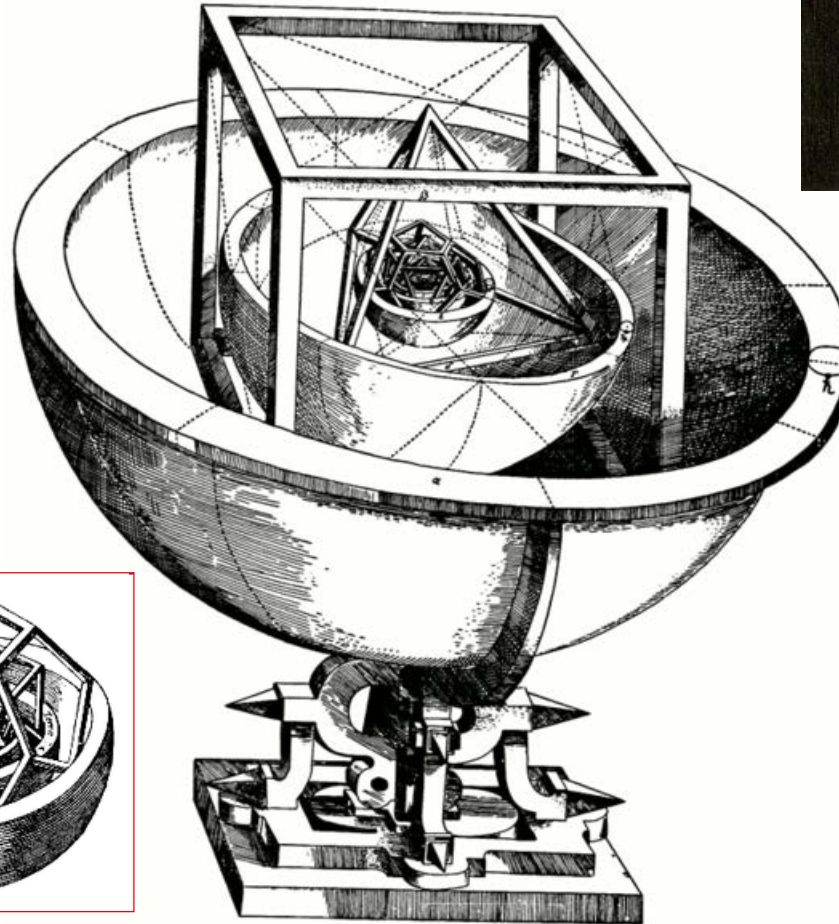
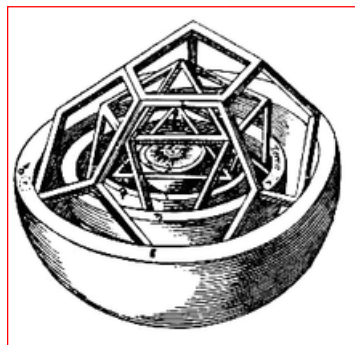
# Johannes Kepler (1571 – 1630 )



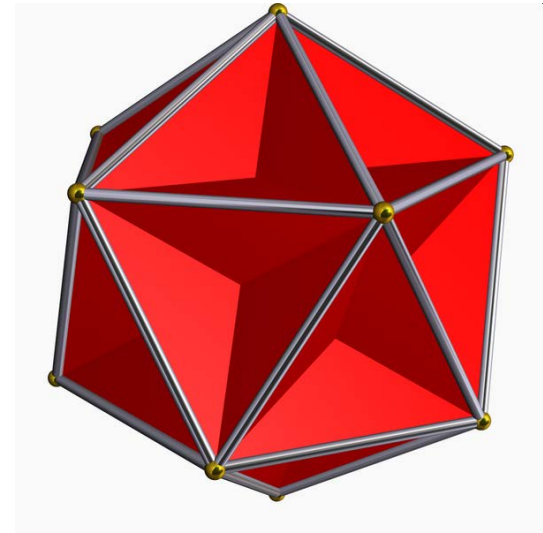
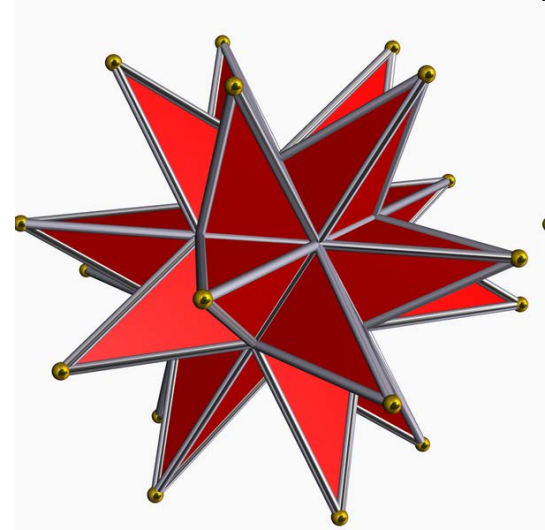
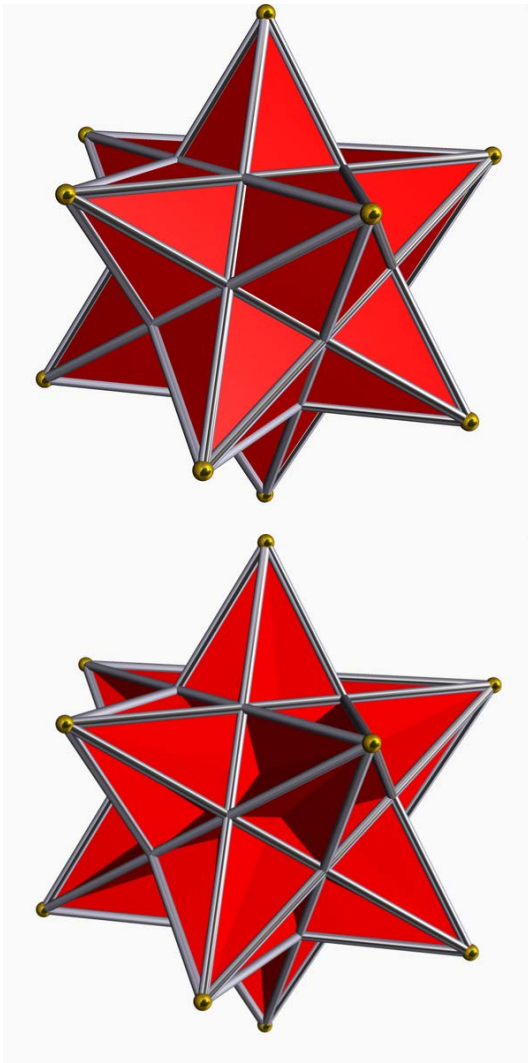
## Uspořádání planetárních sfér ve sluneční soustavě

[Mysterium Cosmographicum (1600)]

Saturn  
KRYCHLE  
Jupiter  
ČTYŘSTĚN  
Mars  
DVANÁCTISTĚN  
Země  
DVACETISTĚN  
Venuše  
OSMISTĚN  
Merkur  
Slunce



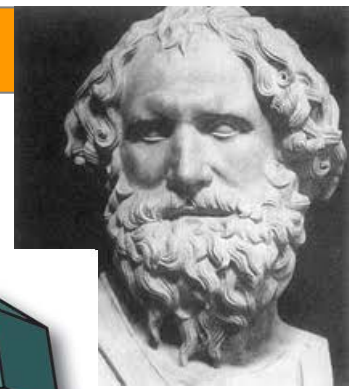
# Keplerovy – Poinsoťovy mnohostěny



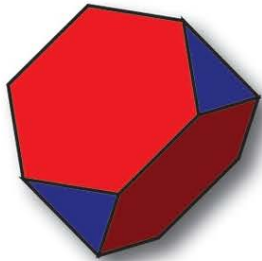
<http://mathworld.wolfram.com/Kepler-PoinsotSolid.html>  
[http://en.wikipedia.org/wiki/Kepler%E2%80%93Poinsot\\_polyhedron](http://en.wikipedia.org/wiki/Kepler%E2%80%93Poinsot_polyhedron)



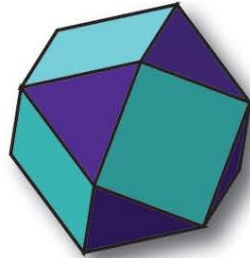
# Archimedes ze Syrakus (287 – 212 př.n.l.)



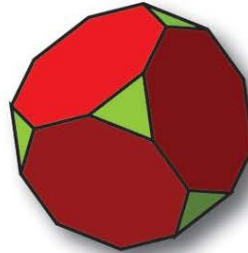
## Archimedovy / polopravidelné mnohostěny



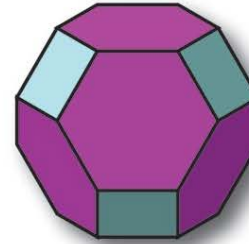
TRUNCATED TETRAHEDRON



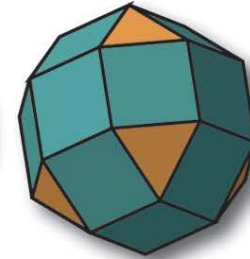
CUBOCTOHEDRON



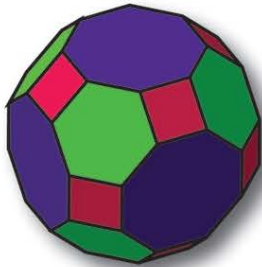
TRUNCATED CUBE



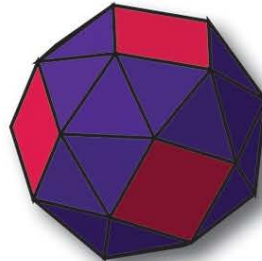
TRUNCATED OCTOHEDRON



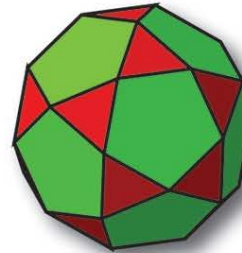
RHOMBICUBOCTOHEDRON



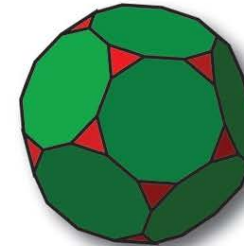
TRUNCATED CUBOCTOHEDRON



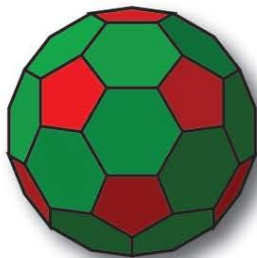
SNUB CUBE



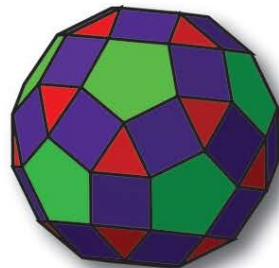
ICOSIDODECAHEDRON



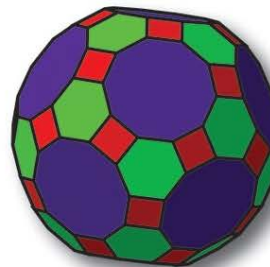
TRUNCATED DODECAHEDRON



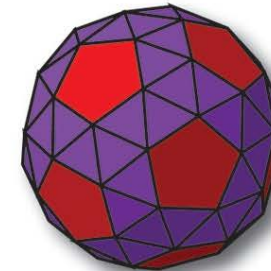
TRUNCATED ICOSAHEDRON



RHOMBICOSIDODECAHEDRON



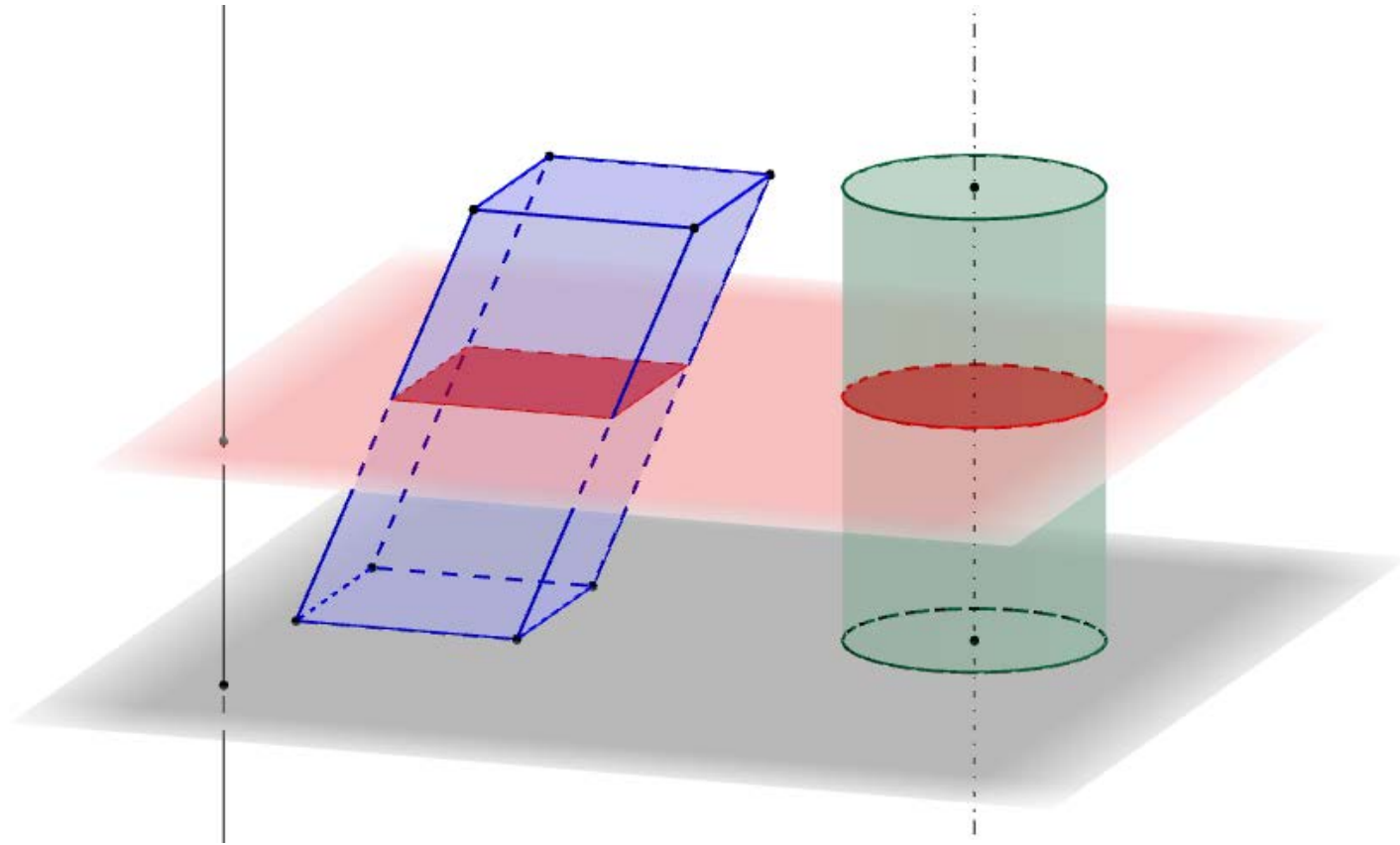
TRUNCATED ICOSIDODECAHEDRON



SNUB DODECAHEDRON



# Cavalieriho princip



## Cavalieriho princip

Jestliže pro dvě tělesa existuje taková rovina, že každá s ní rovnoběžná rovina protíná obě tělesa v rovinných útvarech o témže obsahu, pak mají obě tělesa stejný objem.  
(Bonaventura Cavalieri, 1598–1647, Itálie)

[http://en.wikipedia.org/wiki/Cavalieri%27s\\_principle](http://en.wikipedia.org/wiki/Cavalieri%27s_principle)

<http://www-groups.dcs.st-and.ac.uk/~history/Mathematicians/Cavalieri.html>