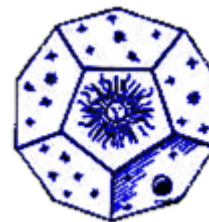
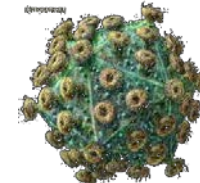
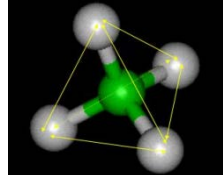
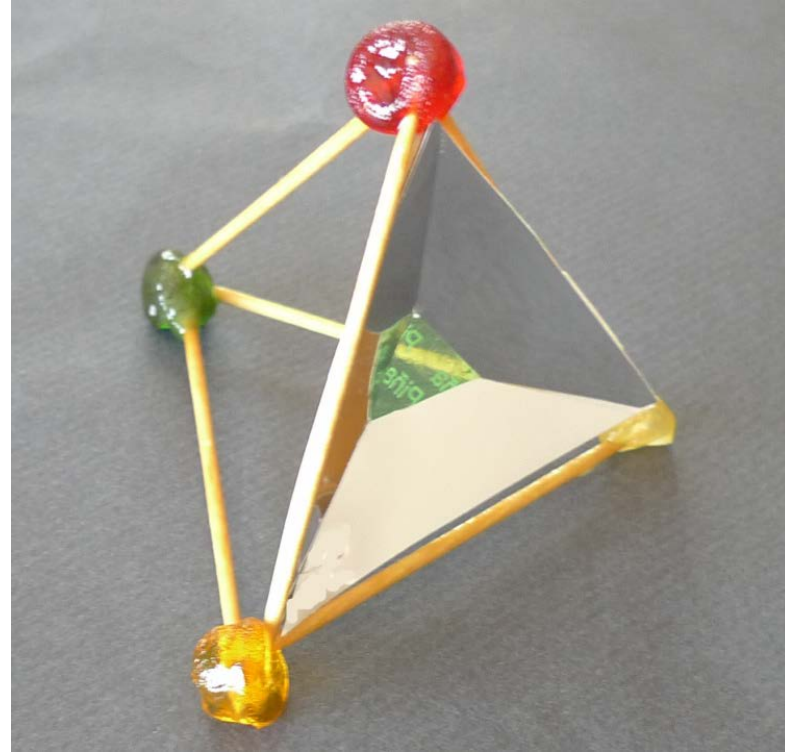
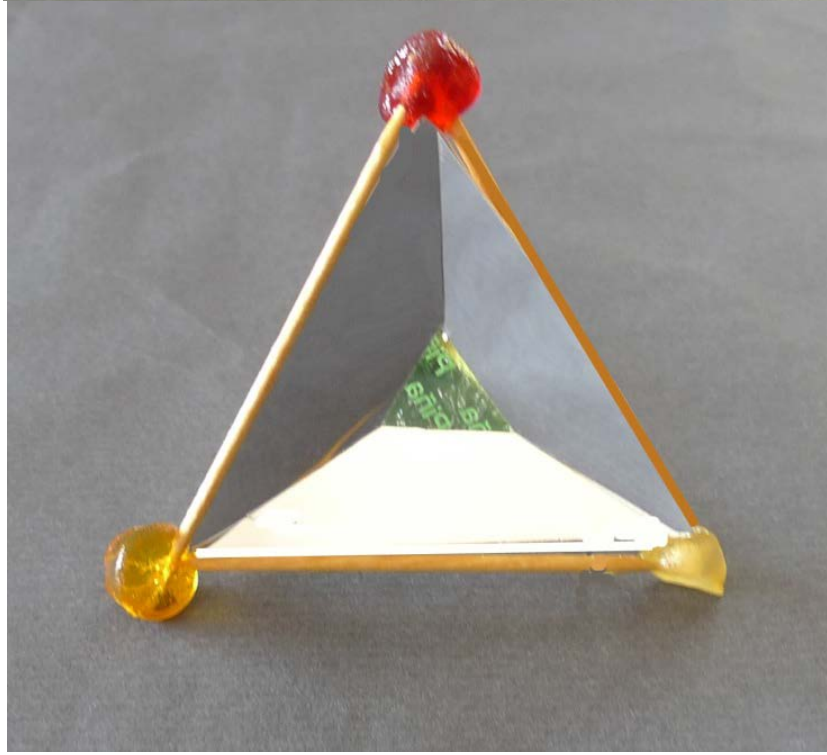
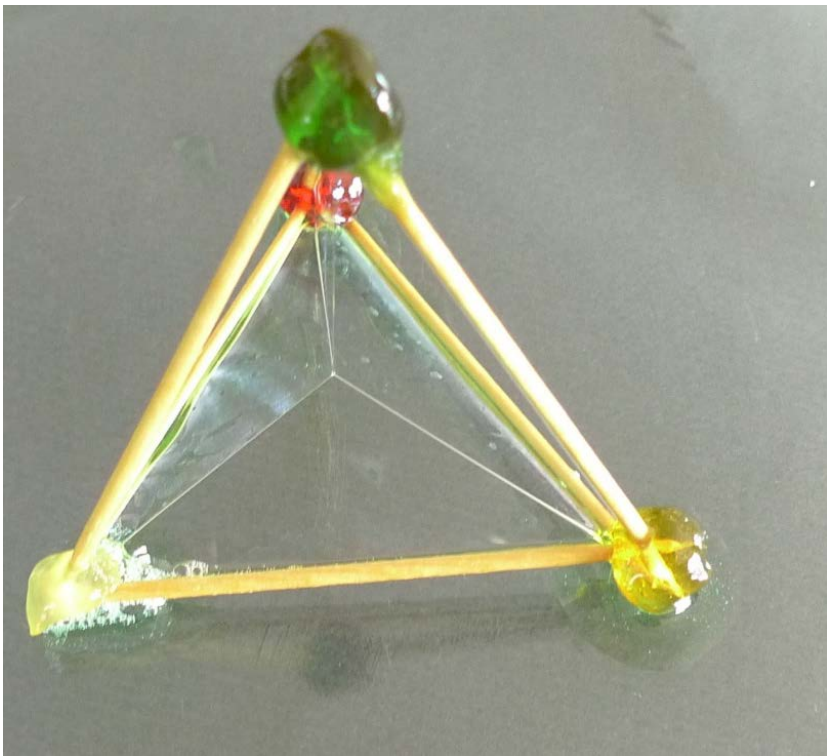


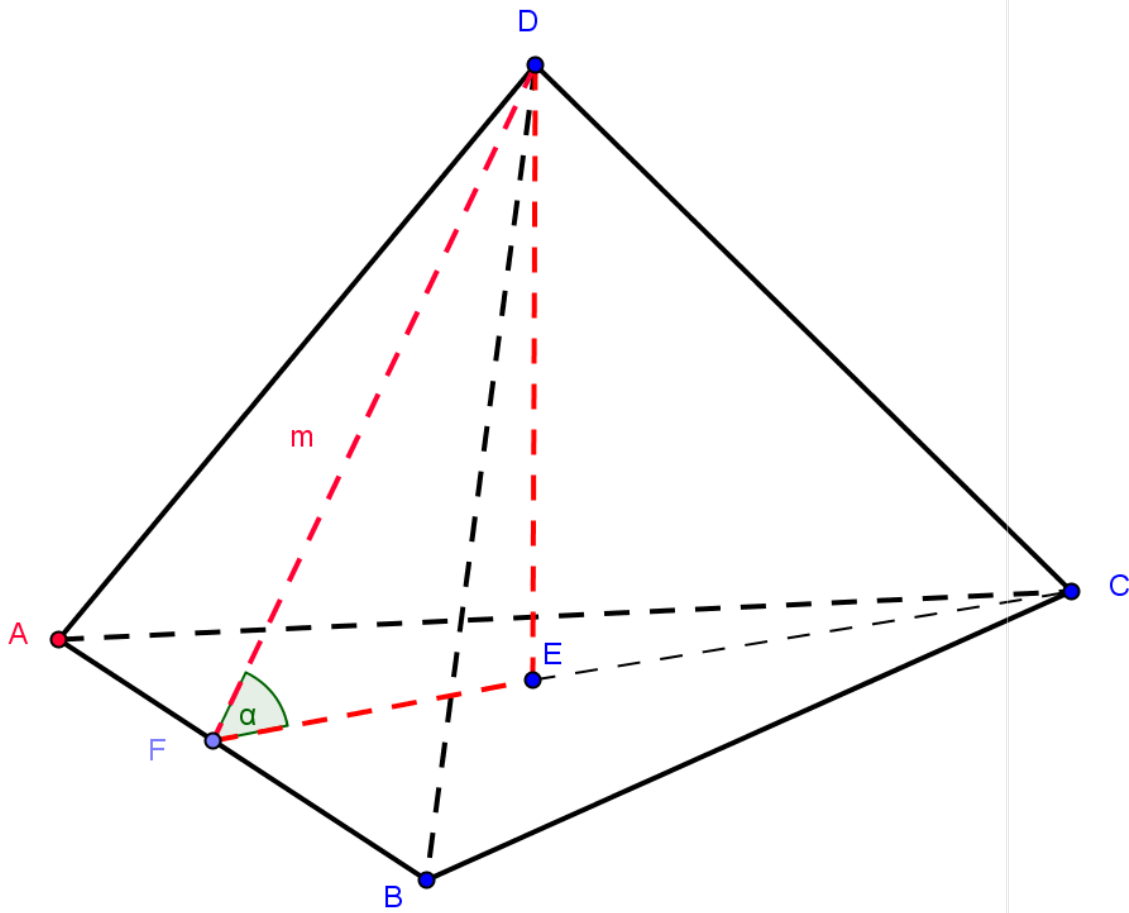
Caleidoscopios poliédricos





Sólidos Platónicos	<u>Tetraedro</u>	<u>Hexaedro, Cu</u> <u>bo</u>	<u>Octaedro</u>	<u>Dodecaedro</u>	<u>Icosaedro</u>
Número de caras	4 (t)	6 (c)	8 (t)	12 (p)	20 (t)
Número de vértices	4	8	6	20	12
Número de aristas	6	12	12	30	30
Ángulo diedro	70° 32'	90°	109° 28'	116° 34'	138° 11'
Angulo en las caras del caleidoscopio	109° 28'	70° 32'	90°	41° 49'	63° 26'
Arista lateral del caleidoscopio	$(a\sqrt{6})/4$	$(a\sqrt{3})/2$	$(a\sqrt{2})/2$	$(a\sqrt{18+6\sqrt{5}})/4$	$(a\sqrt{10+2\sqrt{5}})/4$





FC es la mediana de ACB

E es su baricentro

EC mide $\frac{2}{3}$ de FC que mide igual que $FD=m$

FE mide $\frac{1}{3}$

DFE es un triángulo rectángulo en E

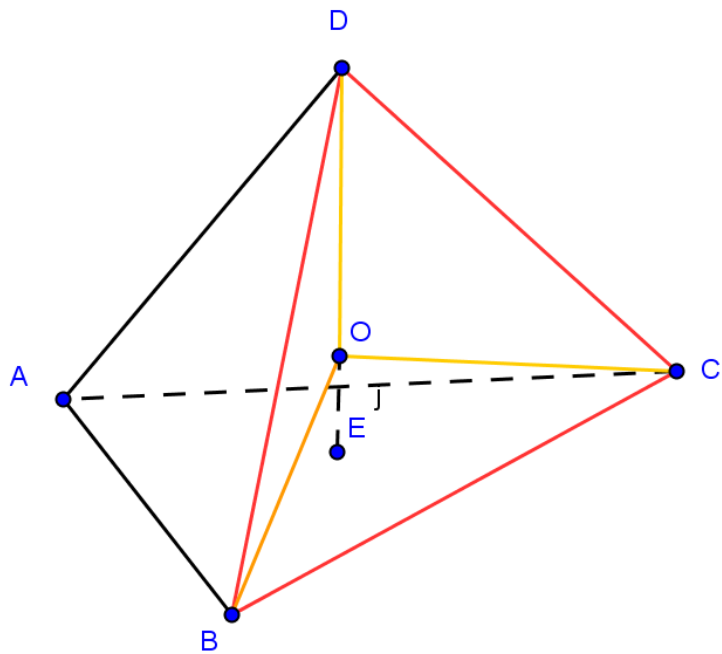
luego

$$\cos(\alpha) = \frac{(m/3)}{m}$$

es decir $\cos(\alpha) = \frac{1}{3}$

por lo que

$$\alpha = 70^\circ 32'$$



Podemos descomponer el tetraedro ABCD

en cuatro pirámides iguales a BCDO,

como las que vimos en película jabonosa

hace tres semanas.

De ello se desprende que

dado que tienen la misma base y 1/4 del volumen

la altura de cada piráide OE

será 1/4 de la altura DE del tetraedro

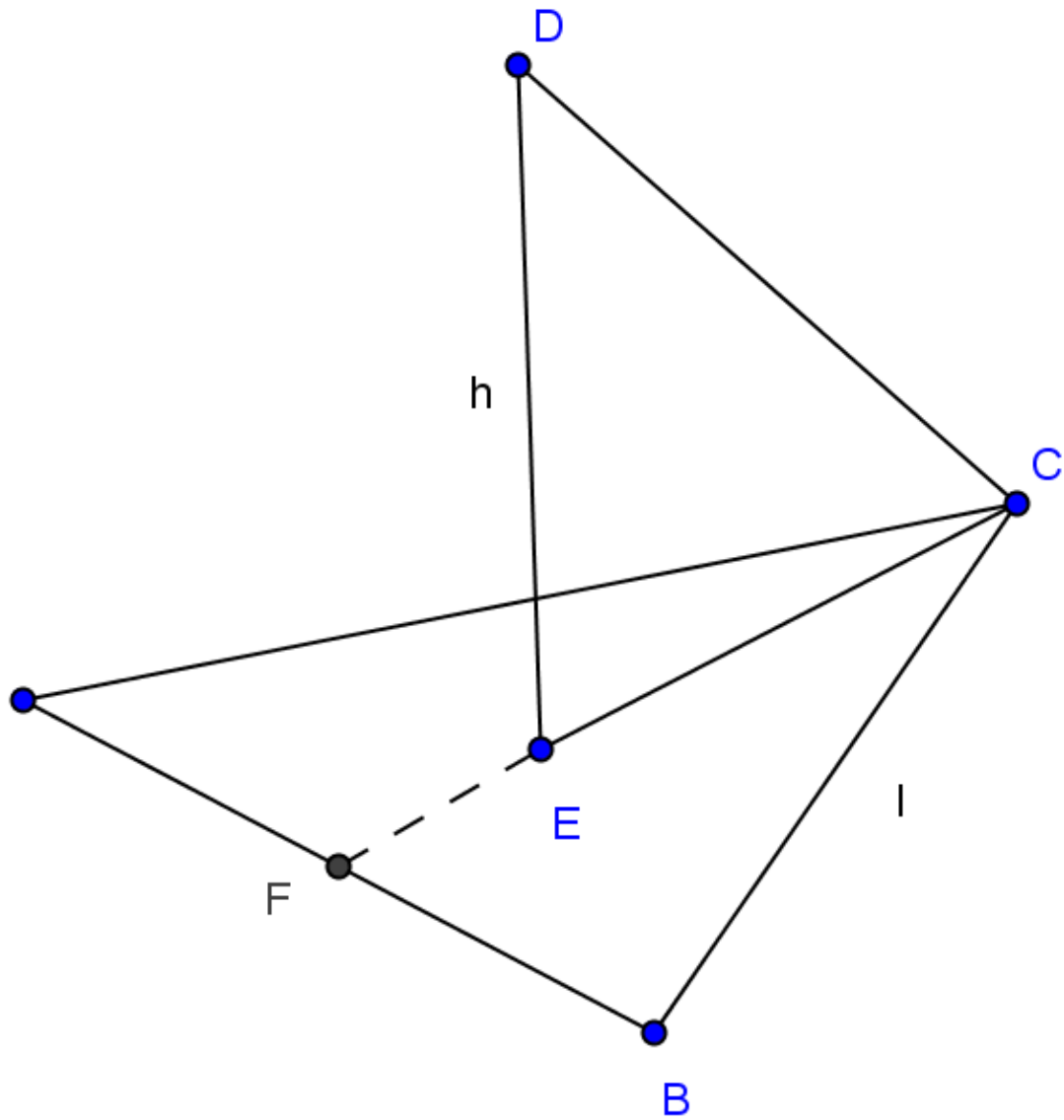
$$\overline{OE} = \frac{1}{3} \overline{DE}$$

y la arista lateral de cada pirámide

medirá el resto, es decir 3/4 de la altura del tetraedro

$$\overline{OD} = \frac{3}{4} \overline{DE}$$





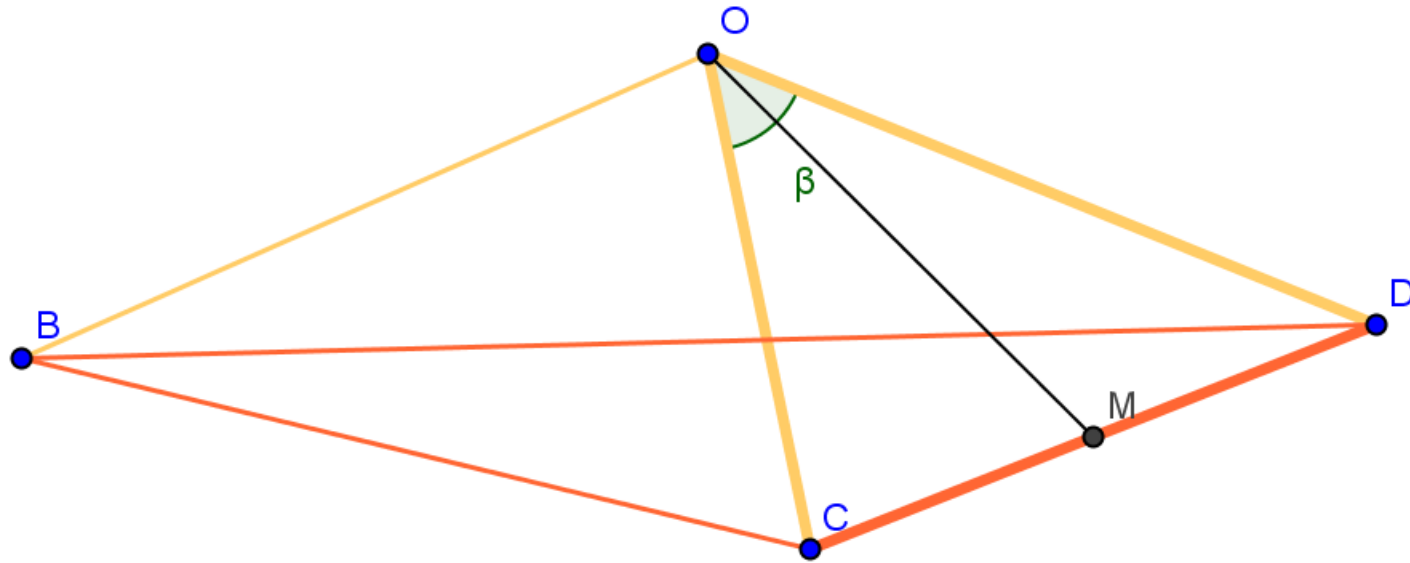
$$l = 1$$

$$\overline{FB} = \frac{1}{2}$$

$$m = \overline{FC} = \sqrt{1 - \frac{1}{4}} = \frac{\sqrt{3}}{2}$$

$$\overline{EC} = \frac{2}{3}m = \frac{\sqrt{3}}{3}$$

$$h = \sqrt{1 - \left(\frac{\sqrt{3}}{3}\right)^2} = \sqrt{\frac{2}{3}}$$



$$CD = 1 \qquad CM = \frac{1}{2} \qquad OC = \frac{3}{4}h \qquad OC = \frac{3}{4}\sqrt{\frac{2}{3}} = \frac{\sqrt{6}}{4}$$

$$\text{sen}(\beta/2) = \frac{\frac{1}{2}}{\frac{\sqrt{6}}{4}} = \frac{\sqrt{6}}{3} \qquad \beta = 109^\circ 28'$$

Entonces, el diedro del tetraedro y la cara de su pirámide-caleidoscopio,

son suplementarios pues: $\alpha + \beta = 70^\circ 32' + 109^\circ 28' = 180^\circ$

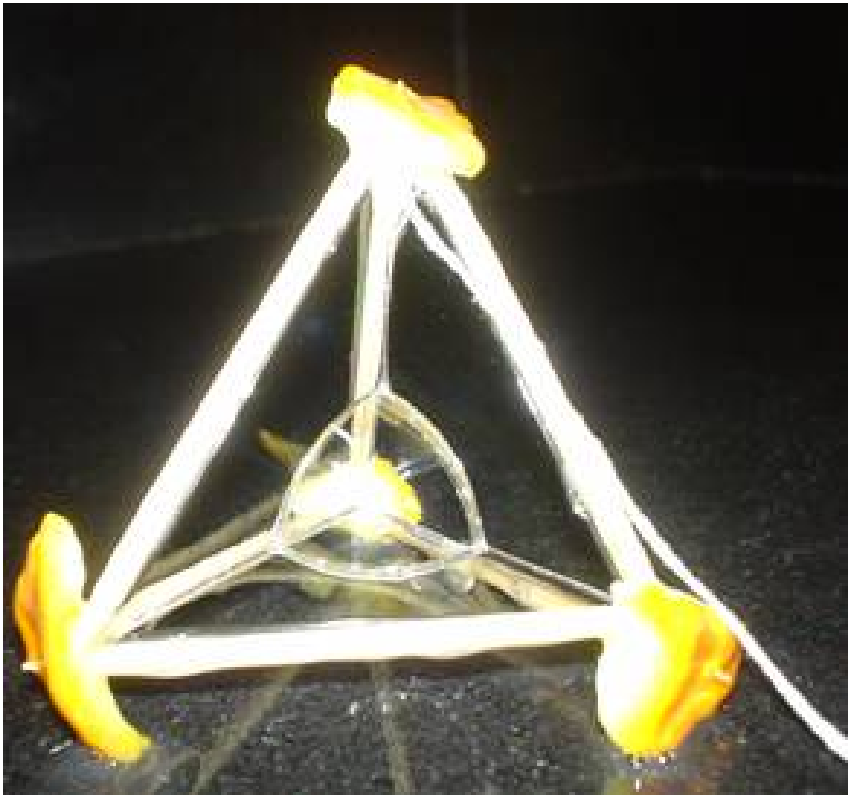


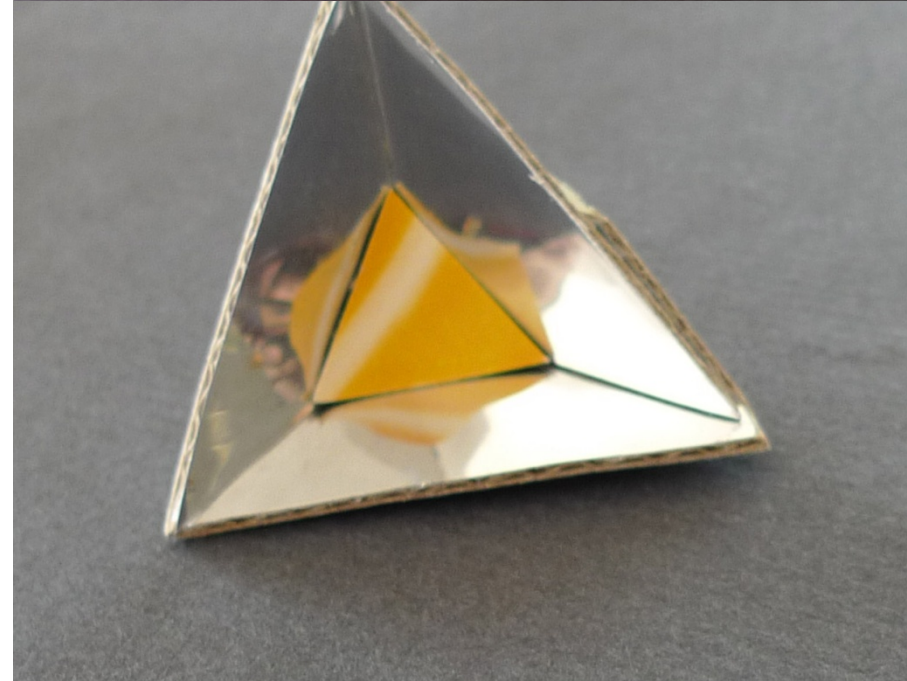
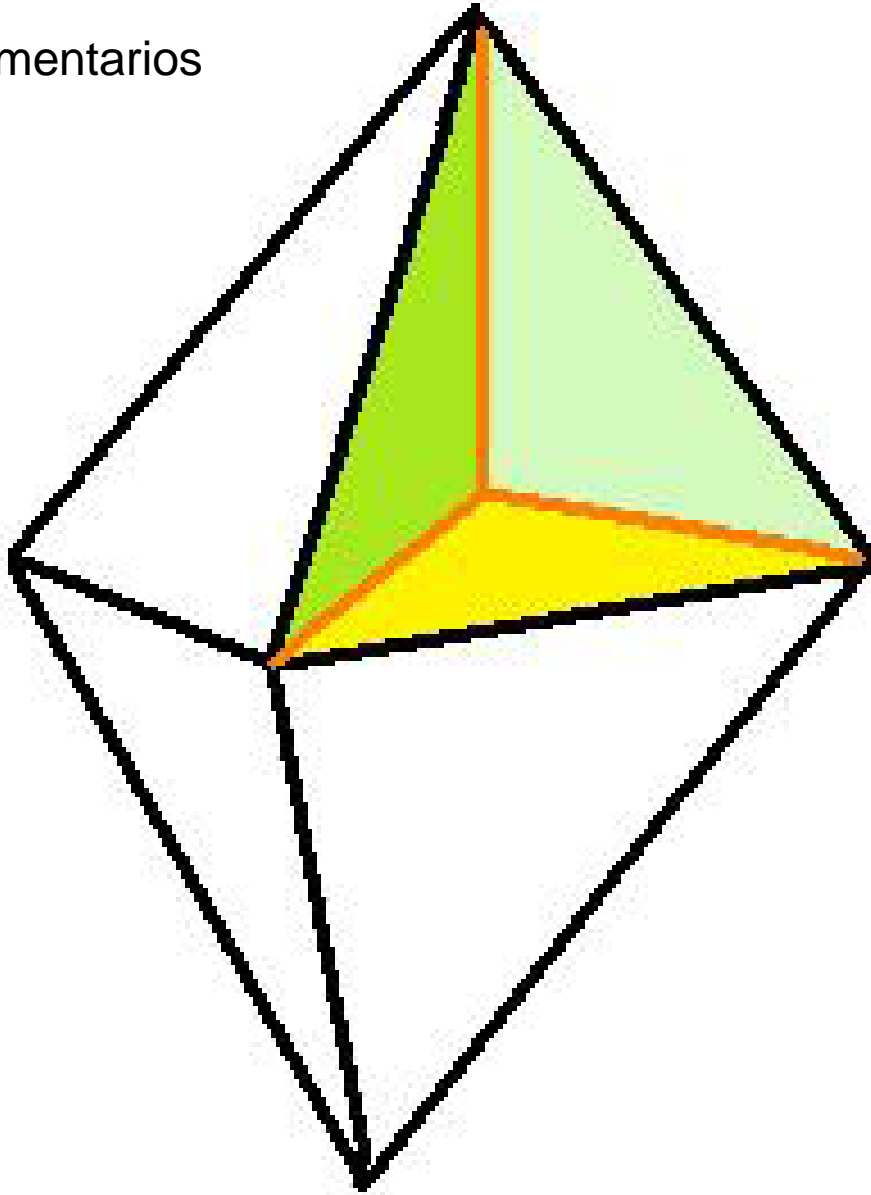
Figura 62. Un esqueleto de nasehrido. *Callinitta agnesae* H.N. (0.15 mm)

Esqueleto de un naseráido

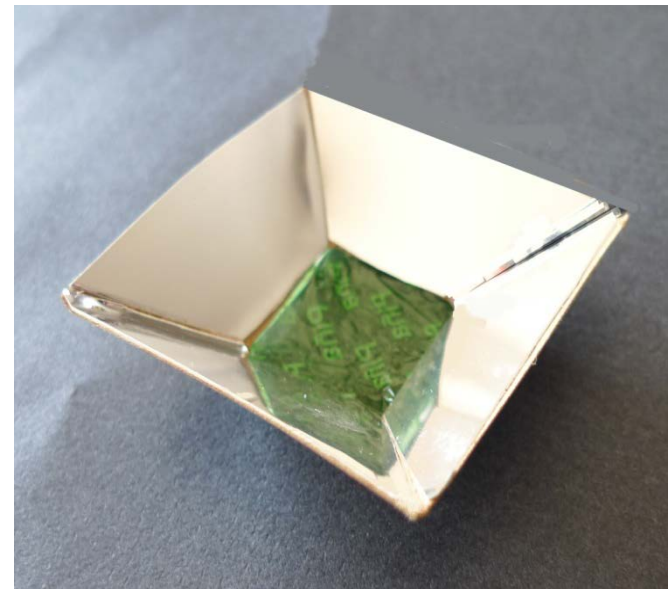
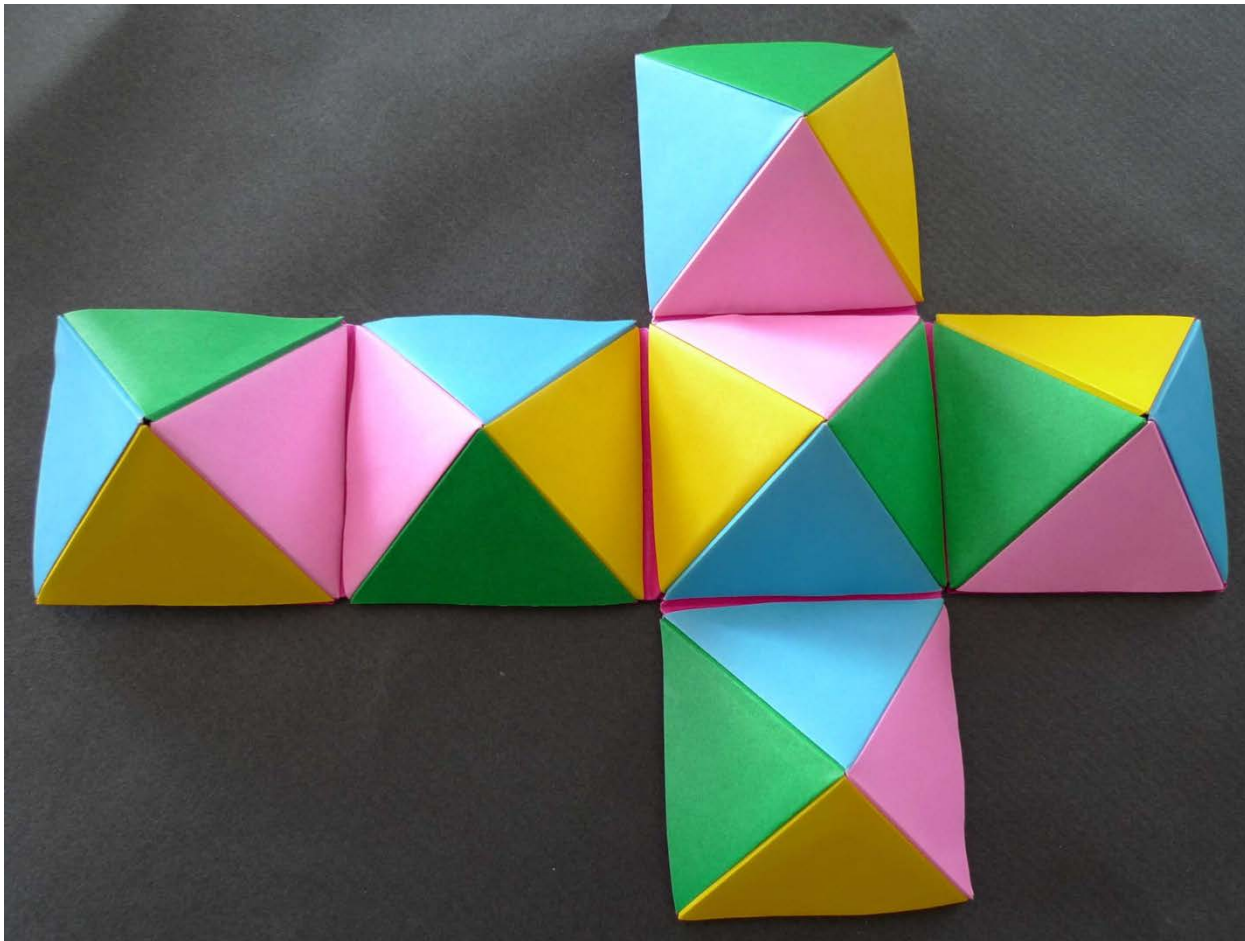
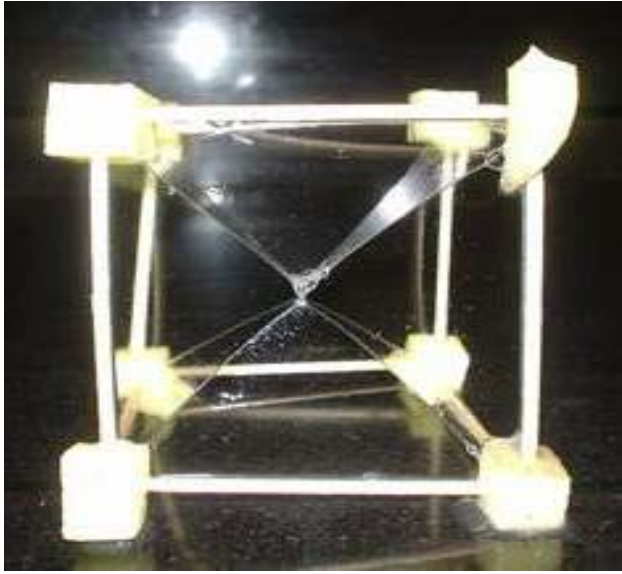
Diedro del cubo = 90°

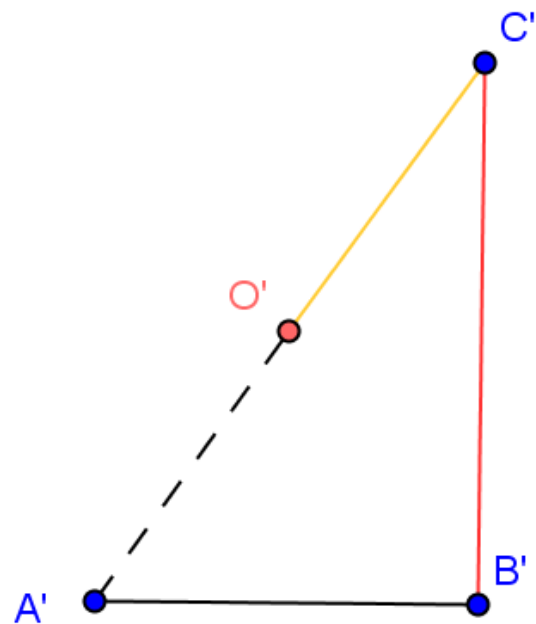
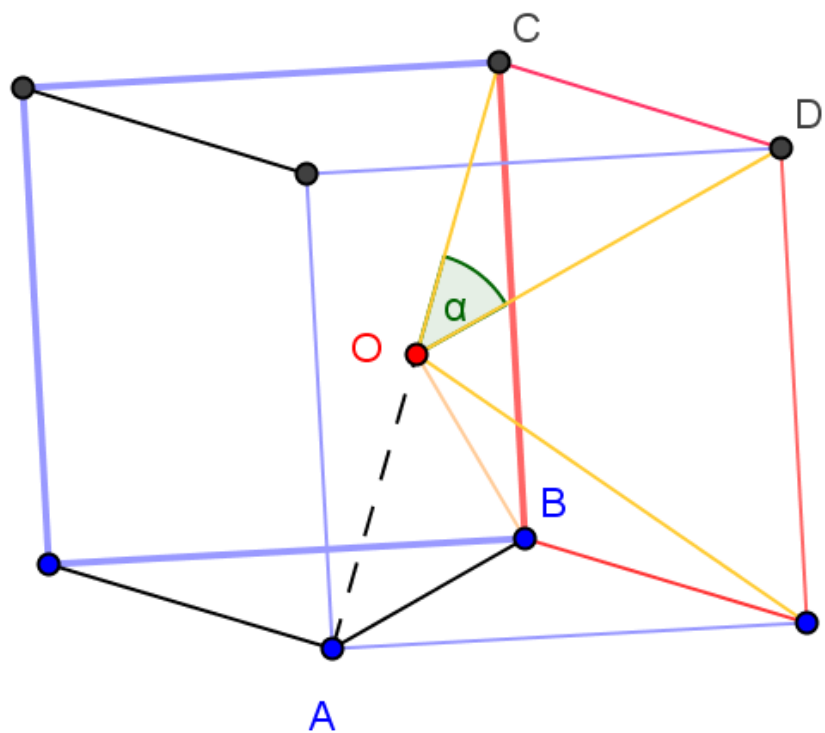
Cara del espejo del octaedro = 90°

Suplementarios





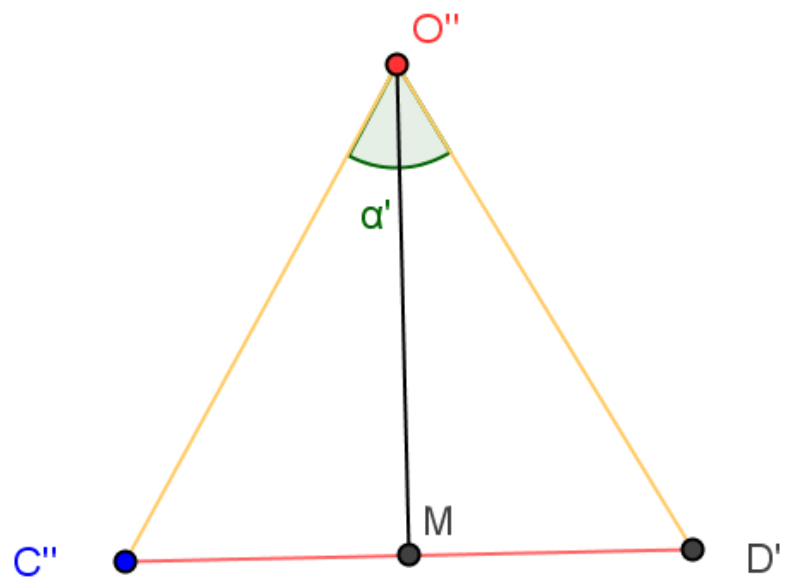


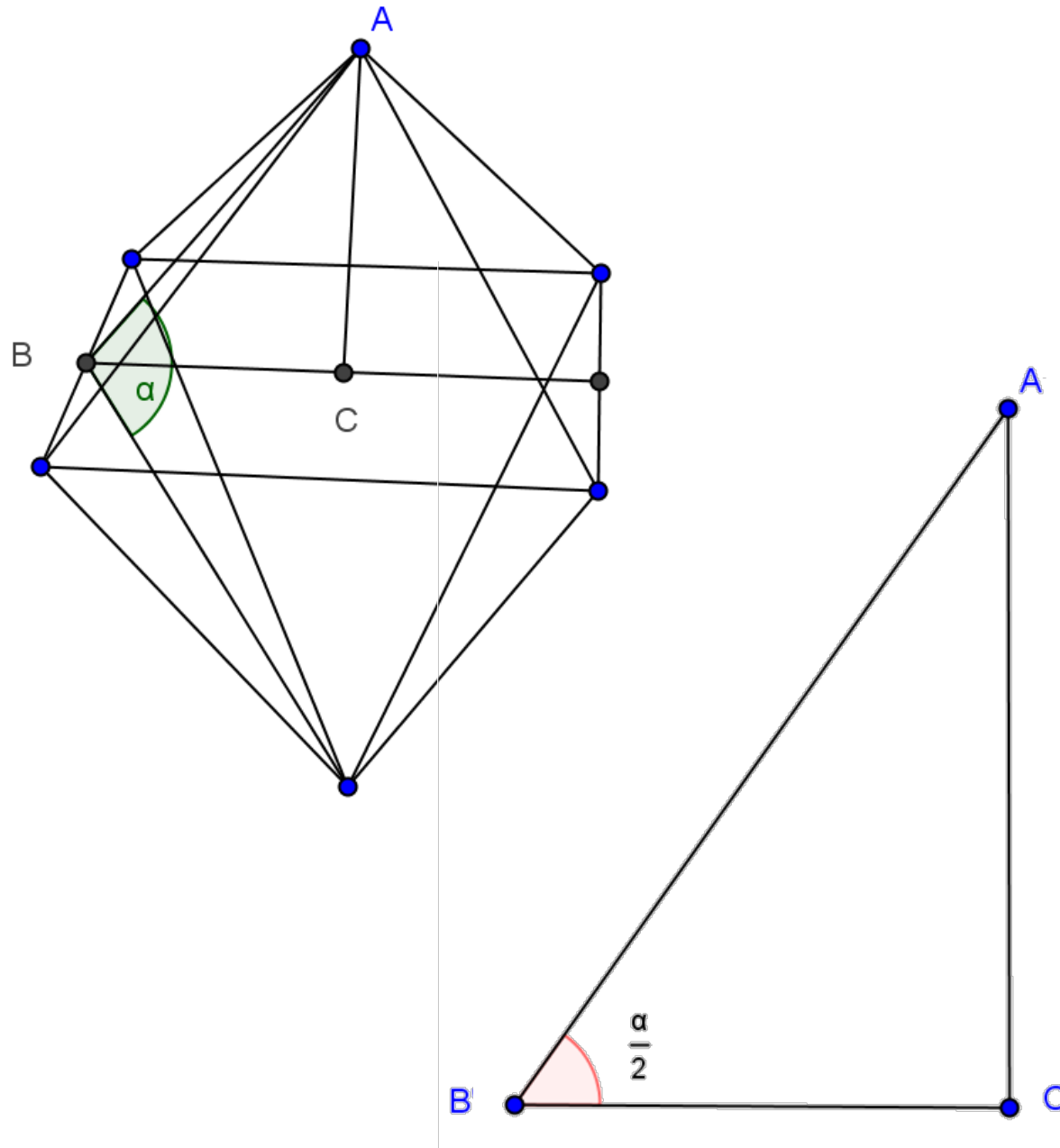


$$\overline{CD}=1 \quad \overline{CM}=\frac{1}{2} \quad \overline{AB}=\sqrt{1+1}=\sqrt{2}$$

$$\overline{CO}=(1/2)\overline{AC}=(1/2)\sqrt{1+2}=\frac{\sqrt{3}}{2}$$

$$\text{sen}(\alpha/2)=\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}=\frac{\sqrt{3}}{3} \quad \alpha = 70^\circ 32'$$



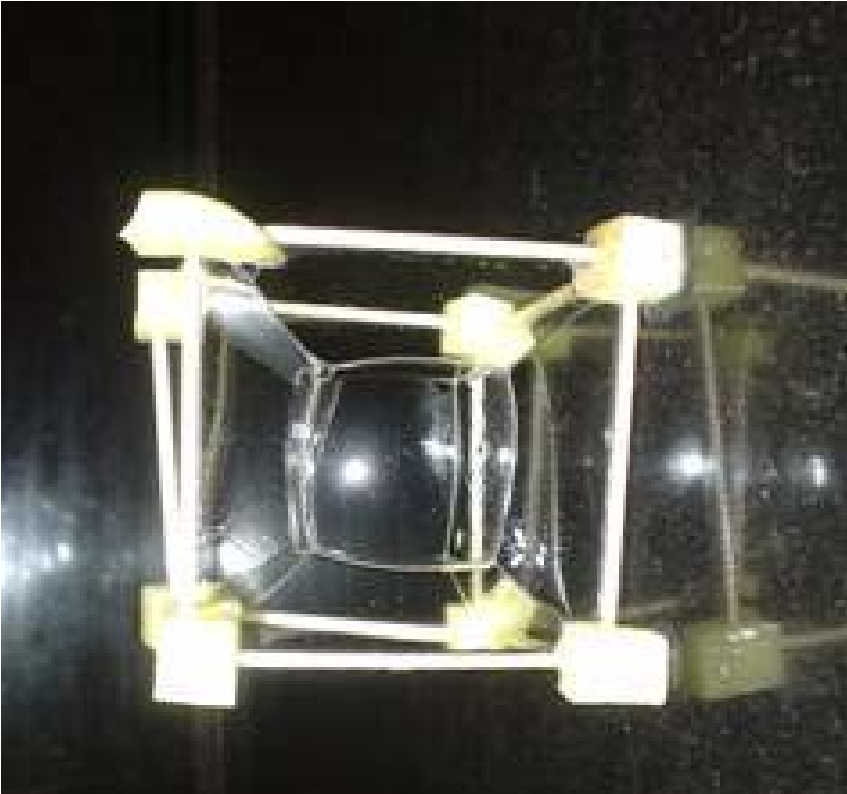


$$\overline{AC} = \frac{\sqrt{2}}{2}$$

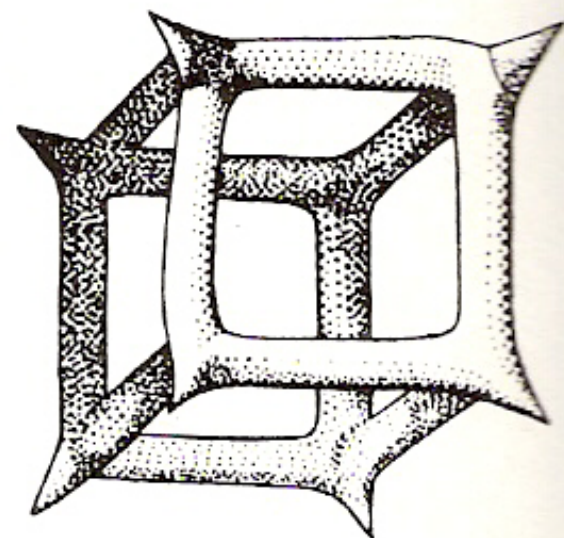
$$\overline{BC} = \frac{1}{2}$$

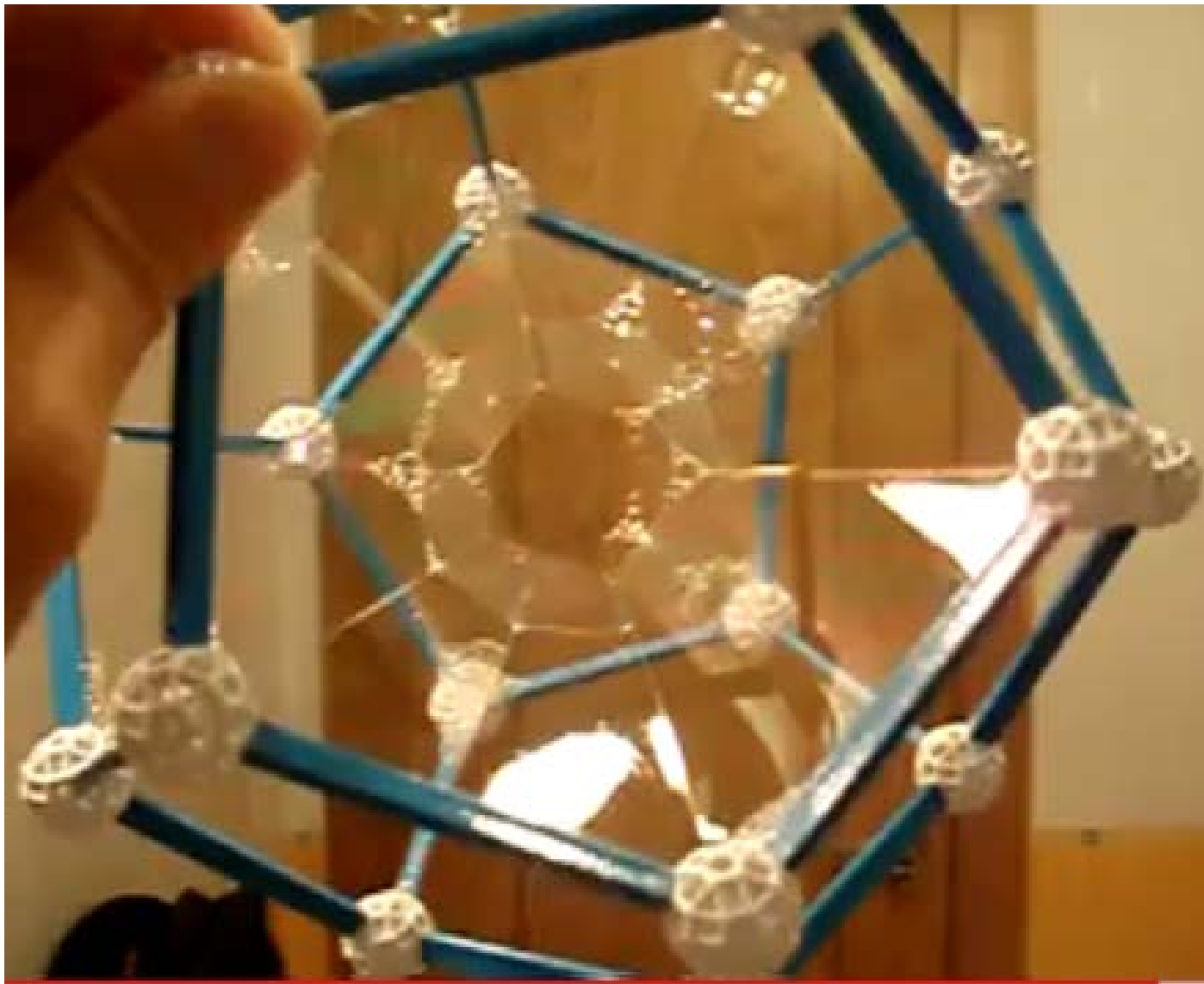
$$\text{tang}(\alpha/2) = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \sqrt{2}$$

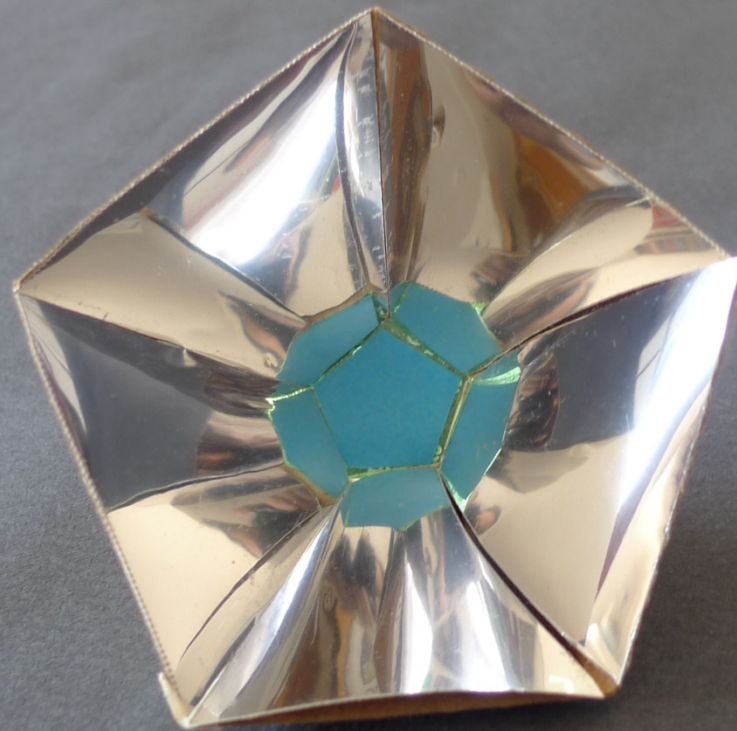
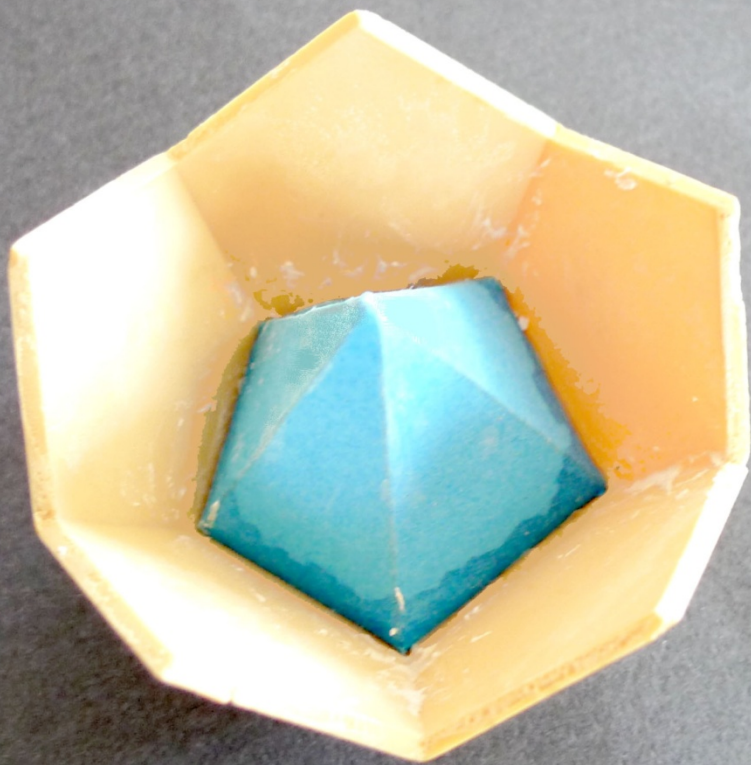
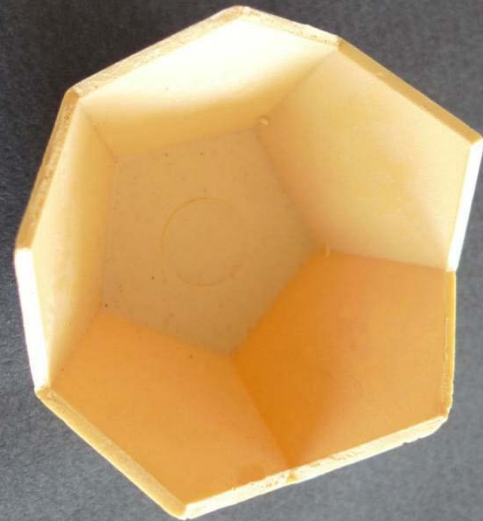
$$\alpha = 109^\circ 28'$$



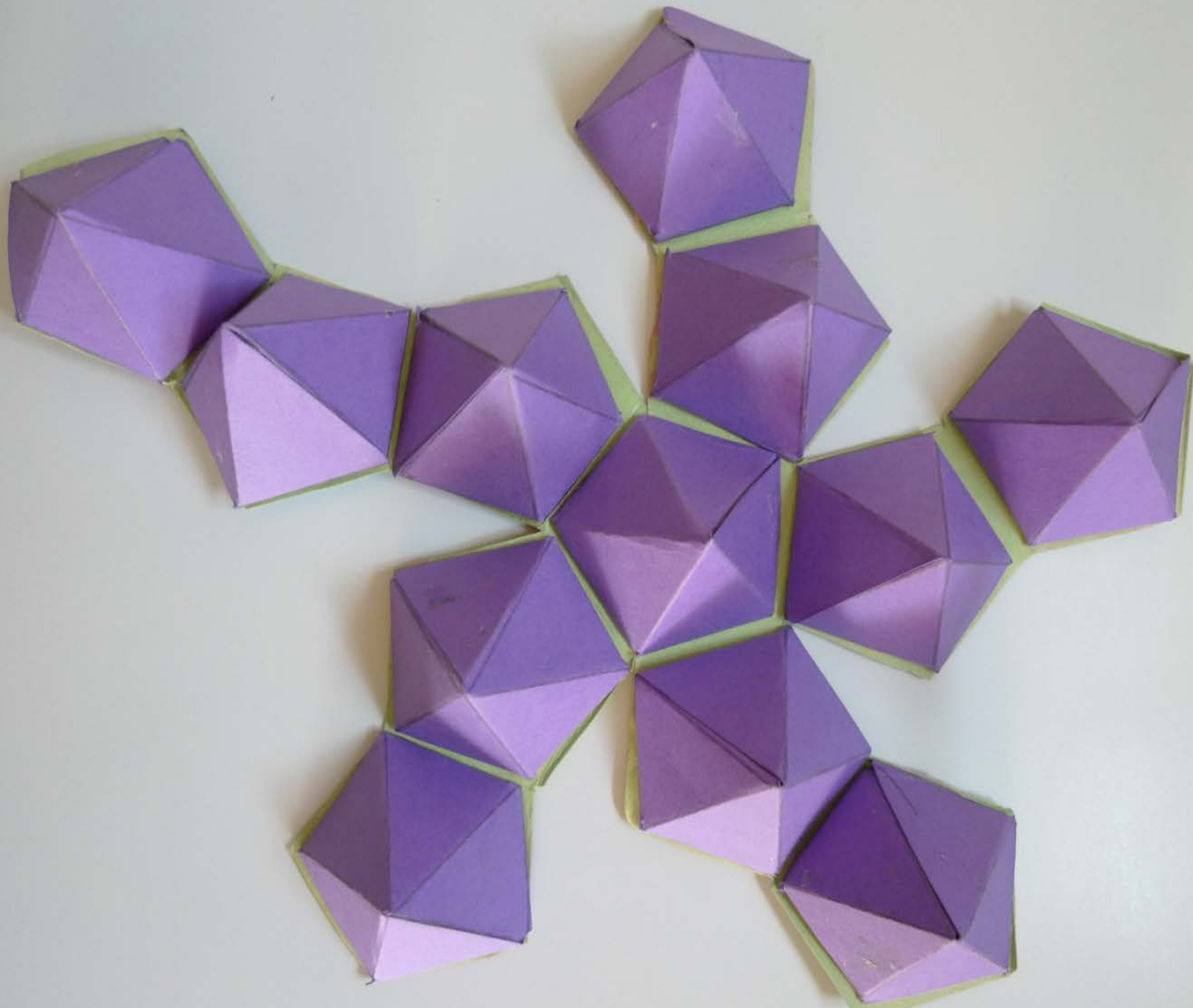
Litocubus geométricus







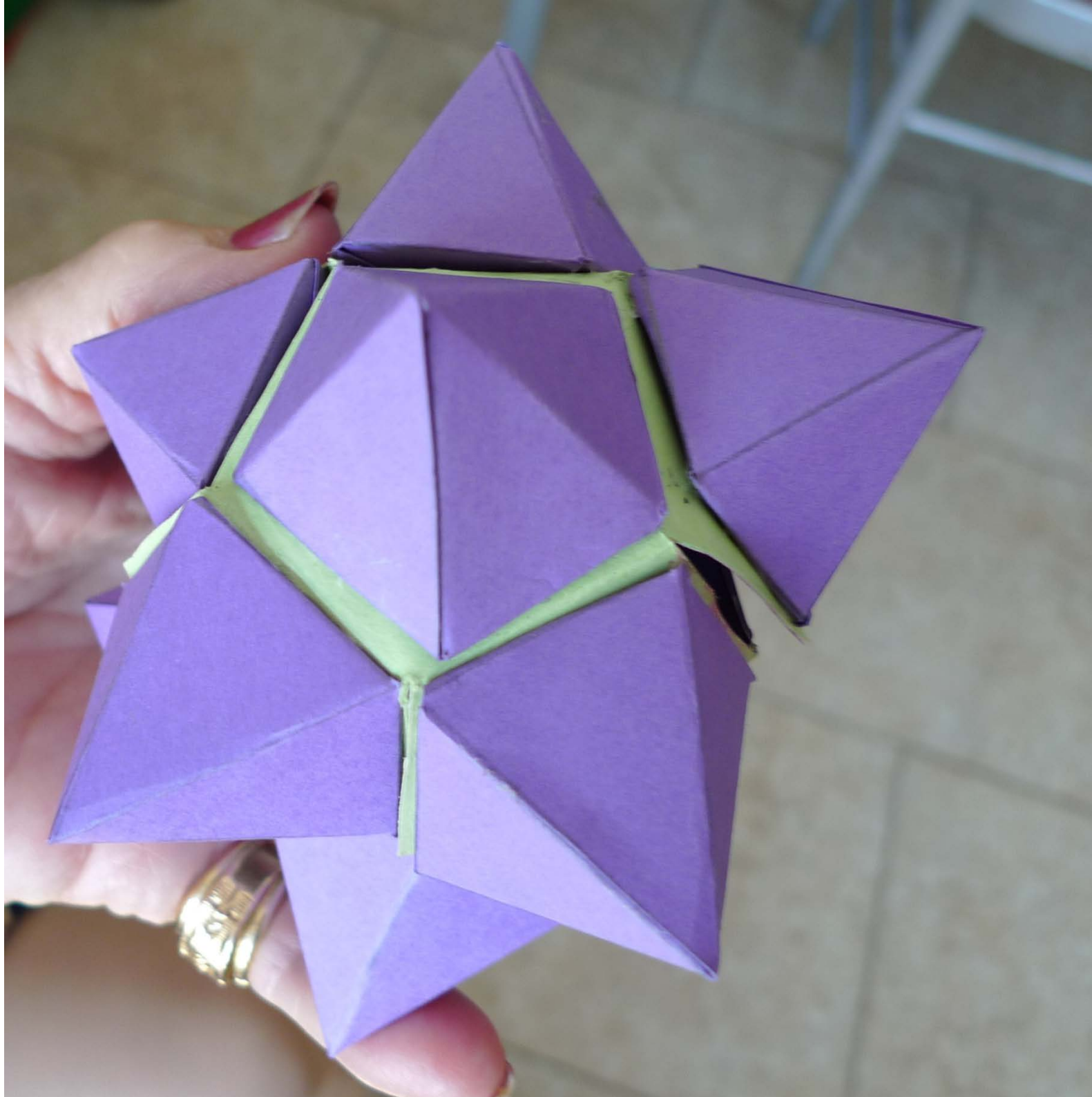




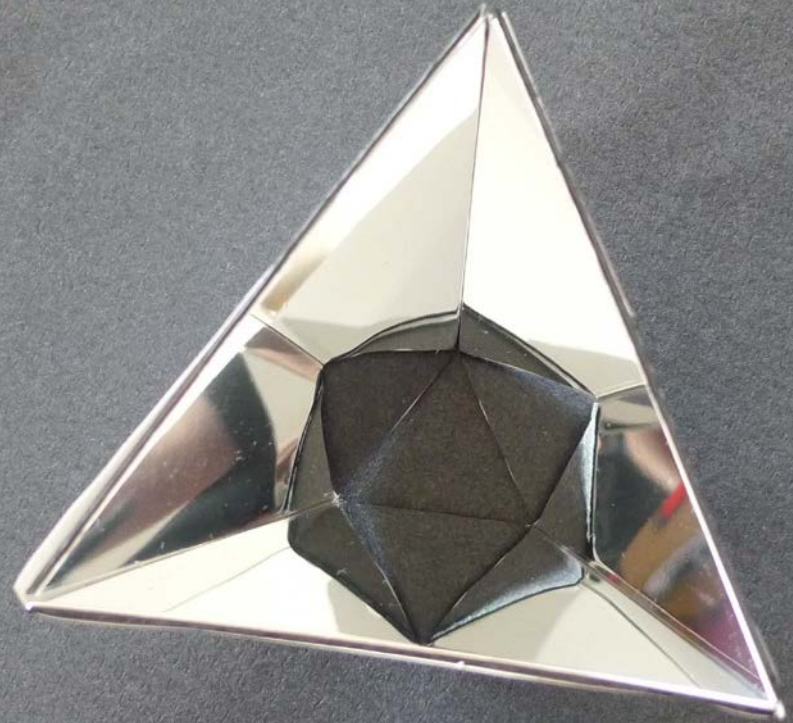
















por internet y por telef

8600 0822 30 972

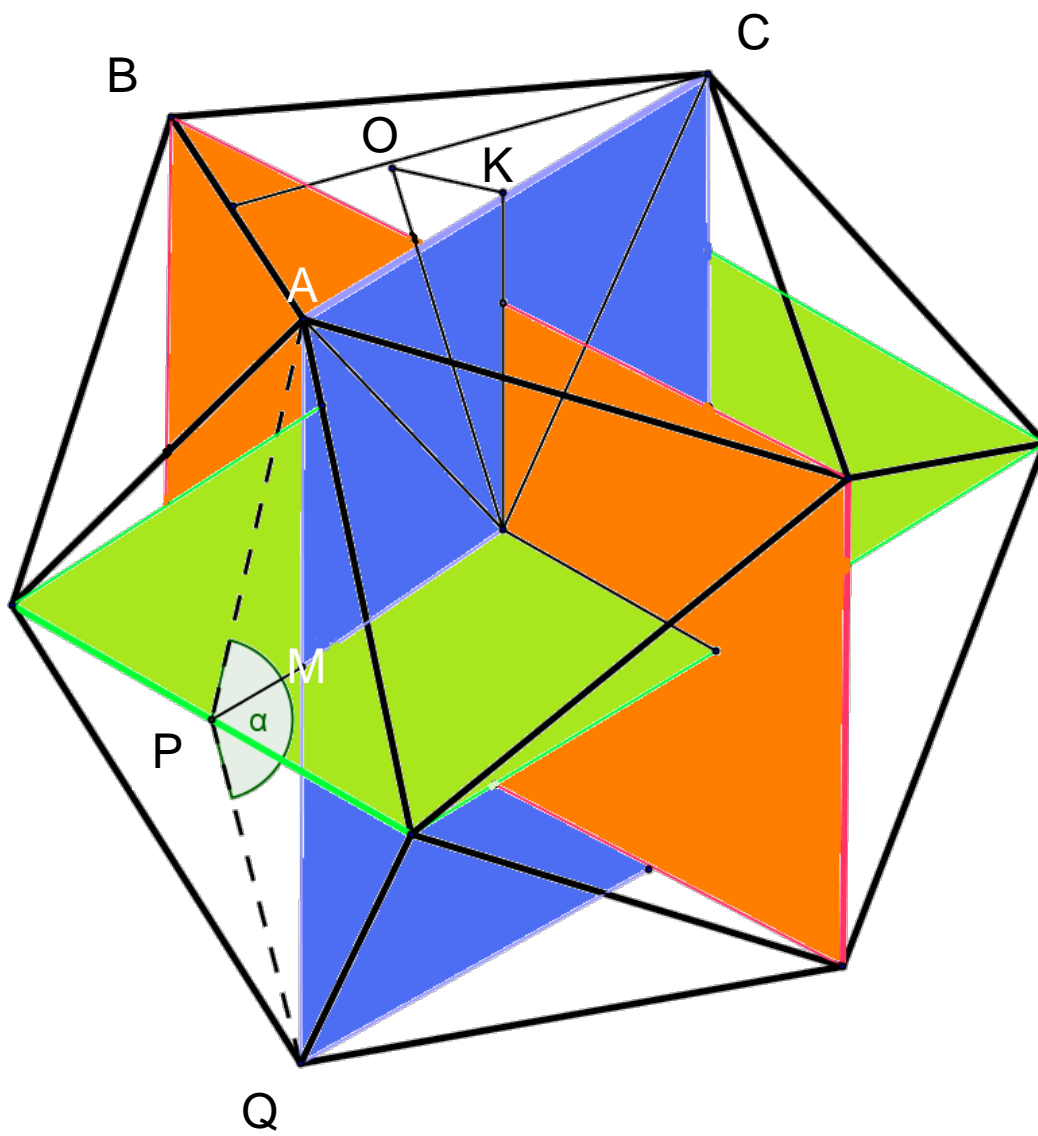
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Caja Prxima: 902
Tif. incidencias, robo o ex
Tif. de consulta ServiRed:

on line

902 20 972



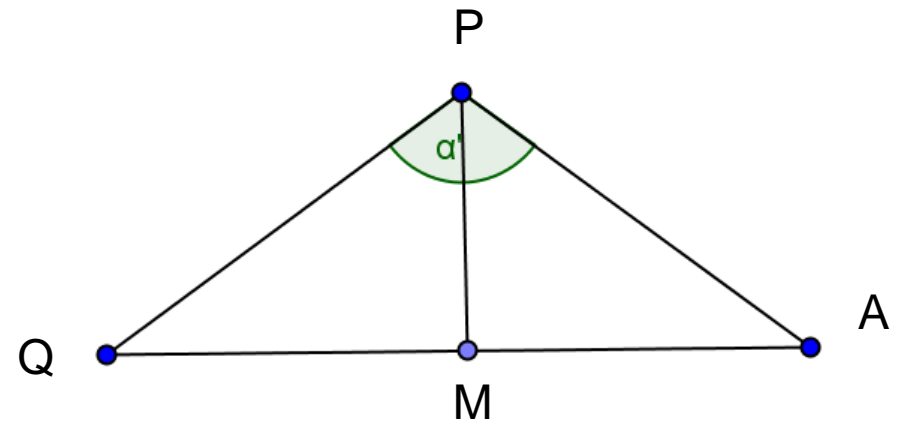
DIEDRO DEL ICOSAEDRO

$$AQ = \phi$$

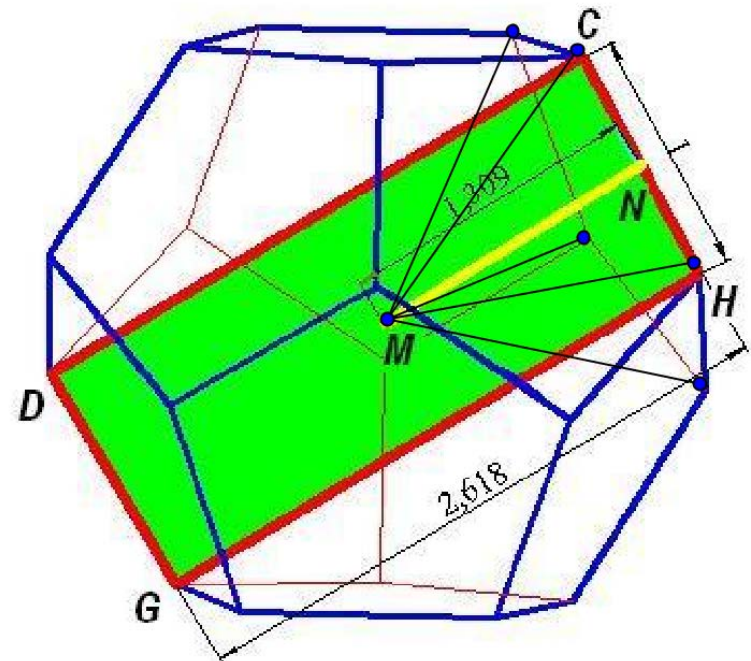
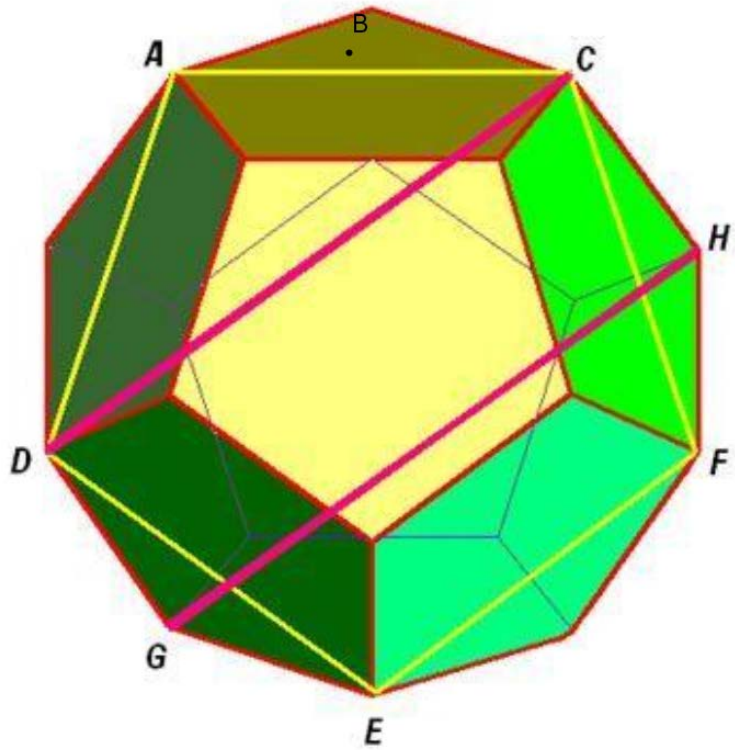
$$AP = \frac{\sqrt{3}}{2}$$

$$\text{sen}\left(\frac{\alpha}{2}\right) = \frac{\frac{\phi}{2}}{\frac{\sqrt{3}}{2}}$$

$$\alpha = 138^\circ 11'$$



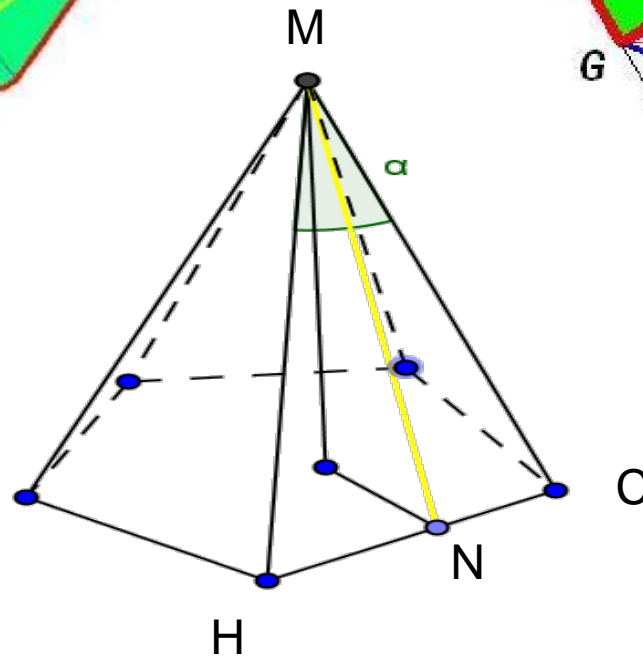
CARA DEL ESPEJO DODECAÉDRICO



$$\frac{\overline{DC}}{\overline{AC}} = \frac{\overline{AC}}{\overline{AB}} = \Phi$$

$$\overline{DC} = \overline{AC}\Phi = \overline{AB}\Phi^2 = \Phi^2$$

para $\overline{AB} = 1$



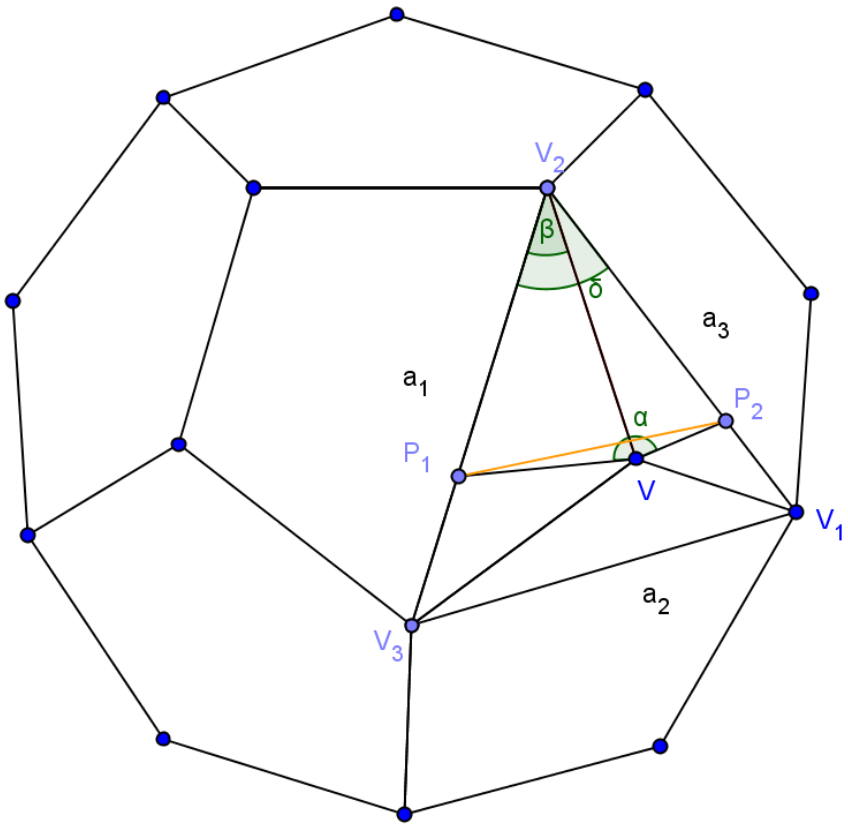
$$\tan\left(\frac{\alpha}{2}\right) = \frac{\frac{1}{2}}{\frac{\Phi^2}{2}}$$

$$\alpha = 41^\circ 49'$$

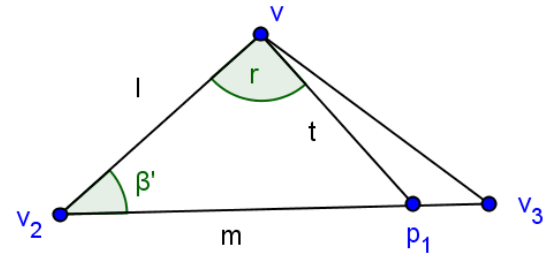
VOLUMEN:

12 * área pentágono * h

DIEDRO DEL DODECAEDRO



$r=90^\circ$
 $\beta=36^\circ$
 $l=1$
 $\delta=60^\circ$

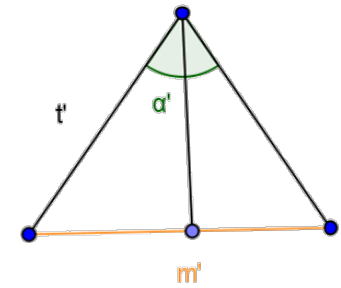


$$\text{tang}(\beta) = \frac{t}{1} = t = \text{tang}(36^\circ) = 0,726542528$$

$$\cos(\beta) = \frac{l}{m} = \frac{1}{m}$$

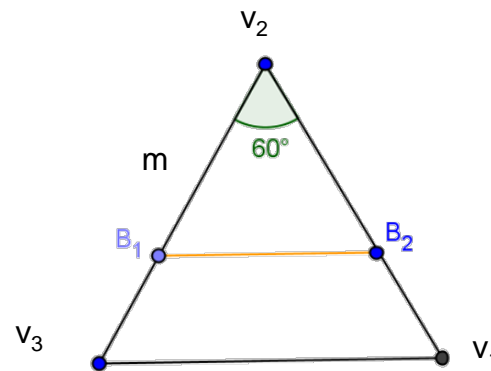
$$m = \frac{1}{\cos(\beta)} = \frac{1}{\cos(36)} = 1,236067977$$

$$\overline{P_1P_2} = m = 1,236067977$$

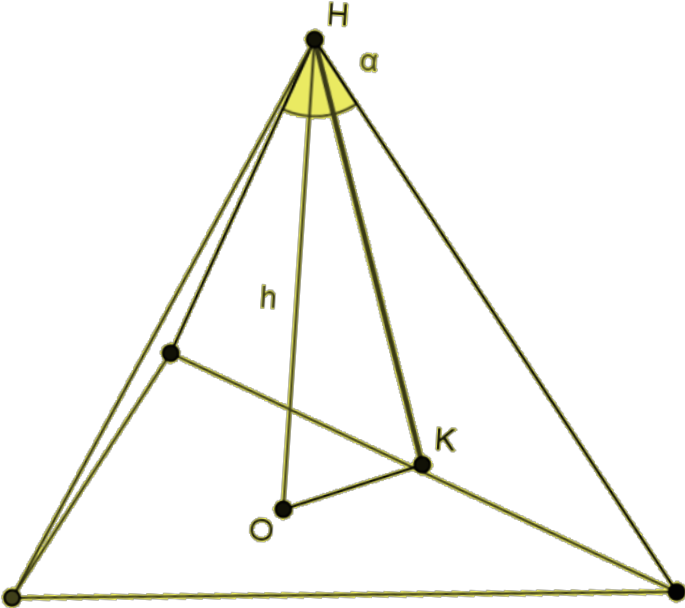
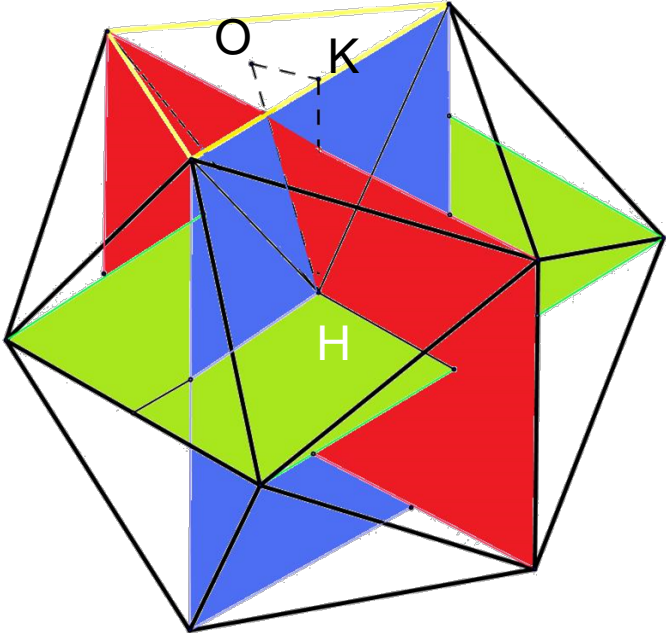


$$\text{sen}\left(\frac{\alpha}{2}\right) = \frac{\frac{1,236067977}{2}}{0,726542528} = 0,8506508084$$

$$\alpha = 116^\circ 34'$$



CARA DEL ESPEJO ICOSAÉDRICO



$$\text{tang}\left(\frac{\alpha}{2}\right) = \frac{1}{\phi} \frac{1}{2}$$

$$\alpha = 63^{\circ}26'$$

VOLUMEN: $20 \cdot \left(\frac{1}{3}\right) \text{base pirámide} \cdot h$

