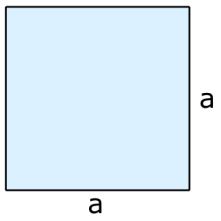
A = Área, S = Área, P = Perímetro, V = Volumen

Figuras del plano

Cuadrado



$A = a^2$

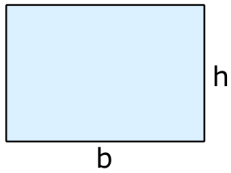
$P = 4a$

Ángulo interno $\alpha = 90°$

Ángulo externo $\beta = 90°$

Núm. diagonales $ND = 2$

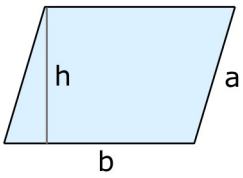
Rectángulo



$A = b \cdot h$

$P = 2b + 2h$

Paralelogramo



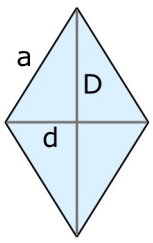
$A = b \cdot h$

$P = 2b + 2a$

$c^2 + d^2 = 2(a^2 + b^2)$

c y d son las diagonales del paralelogramo.

Rombo

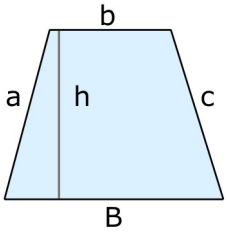


$A = \frac{d \cdot D}{2}$

$P = 4a$

$4a^2 = d^2 + D^2$

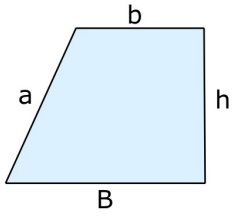
Trapecio



$A = \frac{b + B}{2} h$

$P = a + b + B + c$

Trapecio recto

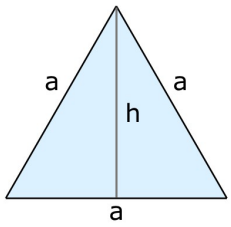


$$A = \frac{b+B}{2}h$$

$$P = a + b + B + h$$

$$a^2 = (B-b)^2 + h^2$$

Triángulo equilátero



$$A = \frac{a \cdot h}{2} = \frac{\sqrt{3}}{4}a^2$$

$$P = 3a$$

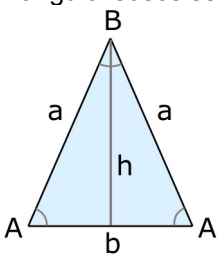
$$h = \frac{\sqrt{3}}{2}a$$

Ángulo interno $\alpha = 60°$

Ángulo externo $\beta = 120°$

Núm. diagonales $ND = 0$

Triángulo isósceles

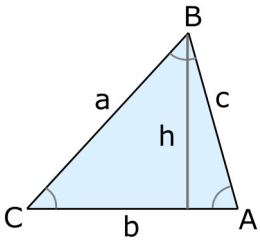


$$S = \frac{b \cdot h}{2} = \frac{a \cdot b \cdot \text{sen } A}{2}$$

$$P = 2a + b\,, \qquad h = a \cdot \text{sen } A$$

$$4a^2 = 4h^2 + b^2$$

Triángulo escaleno



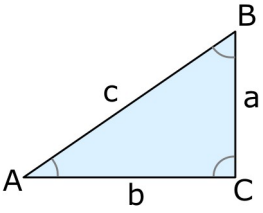
$$S = \frac{b \cdot h}{2}$$

Fórmula de Herón

$$S = \sqrt{s(s-a)(s-b)(s-c)} \qquad s = \frac{a+b+c}{2}$$

$$P = a + b + c \qquad h = c \cdot \text{sen } A = a \cdot \text{sen } C$$

Triángulo rectángulo



$$S = \frac{b \cdot a}{2}$$

$$P = a + b + c$$

Teorema de Pitágoras

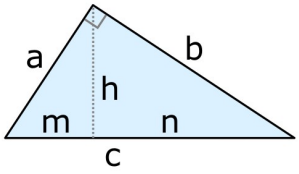
$$c^2 = a^2 + b^2$$

$$a = c \cdot \text{sen } A = c \cdot \cos B$$

$$b = c \cdot \text{sen } B = c \cdot \cos A$$

Radio de la circunferencia inscrita

$$r = \frac{a \cdot b}{a + b + c}$$



Teorema de la altura

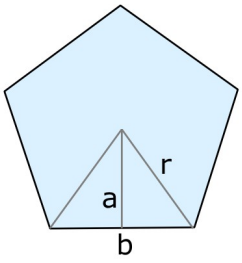
$$h^2 = m \cdot n$$

$$c = m + n$$

Teorema del cateto

$$a^2 = m \cdot c \qquad b^2 = n \cdot c$$

Pentágono regular



$$P = 5b$$

$$A = \frac{P \cdot a}{2} = \frac{5a \cdot b}{2} = \frac{5}{8} r^2 \sqrt{10 + 2\sqrt{5}} = \frac{5}{2} r^2 \cdot \text{sen } 72°$$

$$4r^2 = 4a^2 + b^2$$

$$b = \frac{r}{2}\sqrt{10 - 2\sqrt{5}} = 2r \cdot \text{sen } 36°$$

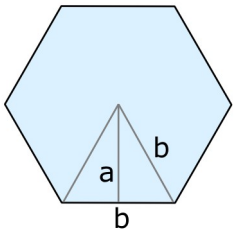
$$a = \frac{r}{4}\sqrt{6 + 2\sqrt{5}} = r \cdot \cos 36°$$

Ángulo interno $\alpha = 108°$

Ángulo externo $\beta = 72°$

Núm. diagonales $ND = 5$

Hexágono regular



$$P = 6b$$

$$A = \frac{P \cdot a}{2} = \frac{3\sqrt{3}}{2} b^2 = 3b^2 \cdot \text{sen } 60°$$

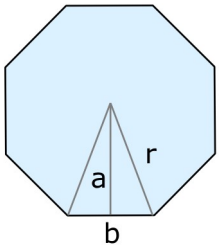
$$a = \frac{\sqrt{3}}{2} b = b \cdot \cos 30°$$

Ángulo interno $\alpha = 120°$

Ángulo externo $\beta = 60°$

Núm. diagonales $ND = 9$

Octágono regular



$$P = 8 \cdot b = 16 \cdot a \cdot \tan 22{,}5°$$

$$A = \frac{P \cdot a}{2} = 4 \cdot a \cdot b = 8 \cdot a^2 \cdot \tan 22{,}5° = \left(8\sqrt{2} - 8\right) a^2 = \frac{2b^2}{\tan 22{,}5°} = \frac{2b^2}{\sqrt{2} - 1}$$

$$a = r \cdot \cos 22{,}5°$$

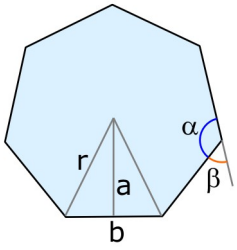
$$b = 2r \cdot \text{sen} 22{,}5°$$

Ángulo interno $\alpha = 135°$

Ángulo externo $\beta = 45°$

Núm. diagonales $ND = 20$

Polígono regular de *n* lados



$$P = n \cdot b = 2n \cdot a \cdot \tan \frac{180°}{n}$$

$$A = \frac{P \cdot a}{2} = \frac{n \cdot a \cdot b}{2} = n \cdot a^2 \cdot \tan \frac{180°}{n}$$

$$a = r \cdot \cos \frac{180°}{n}$$

$$b = 2r \cdot \text{sen} \frac{180°}{n}$$

Ángulo interno :

$$\alpha = \frac{(n-2) \cdot 180°}{n}$$

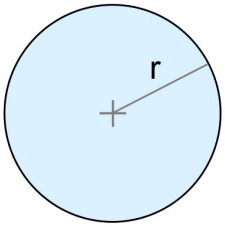
Ángulo externo :

$$\beta = 180° - \alpha$$

Núm. diagonales :

$$ND = \frac{n \cdot (n-3)}{2}$$

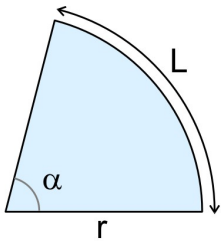
Círculo



$$A = \pi r^2$$

$$P = 2\pi r$$

Sector circular



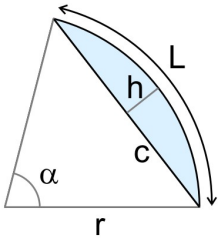
$$A = \pi r^2 \frac{\alpha}{360°}$$

$$L = \pi r \frac{\alpha}{180°}$$

$$P = 2r + L$$

α en grados sexagesimales

Segmento circular



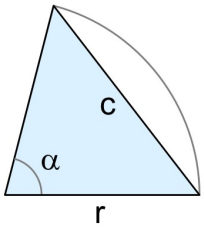
$$A = r^2\left(\frac{\pi \cdot \alpha}{360°} - \frac{\operatorname{sen}\alpha}{2}\right)$$

$$h = r\left(1 - \cos\frac{\alpha}{2}\right) \qquad c = 2r \cdot \operatorname{sen}\frac{\alpha}{2} \qquad L = \pi r \frac{\alpha}{180°}$$

$$P = L + c \qquad r = \frac{h}{2} + \frac{c^2}{8h}$$

α en grados sexagesimales

Triángulo circular

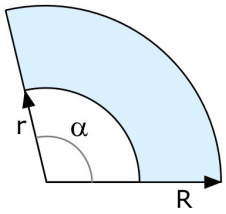


$$A = r^2 \frac{\operatorname{sen}\alpha}{2} \qquad c = 2r \cdot \operatorname{sen}\frac{\alpha}{2}$$

$$P = 2r + c$$

α en grados sexagesimales

Trapecio circular

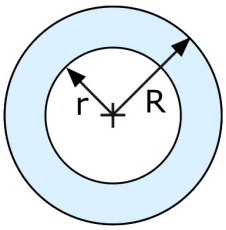


$$A = \pi\left(R^2 - r^2\right)\frac{\alpha}{360°}$$

$$P = 2\pi\,(R + r)\frac{\alpha}{360°} + 2(R - r)$$

α en grados sexagesimales

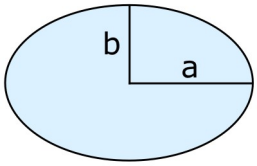
Corona circular



$$A = \pi\left(R^2 - r^2\right)$$

$$P = 2\pi\,(R + r)$$

Elipse

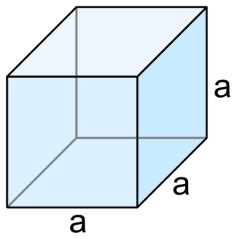


$$A = \pi\, a \cdot b$$

$$P \cong \pi\,(a + b)$$

$$P = 4\int_0^{\pi/2} \sqrt{a^2 \operatorname{sen}^2 t + b^2 \cos^2 t}\; dt$$

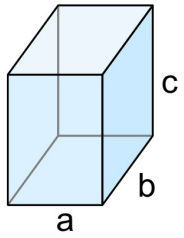
Cubo (hexaedro)



$$A = 6\,a^2$$

$$V = a^3$$

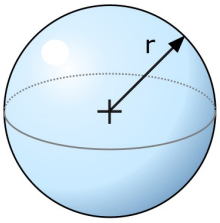
Prisma recto



$$A = 2a{\cdot}b + 2a{\cdot}c + 2b{\cdot}c$$

$$V = a{\cdot}b{\cdot}c$$

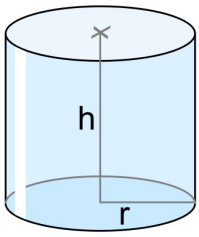
Esfera



$$A = 4\pi{\cdot}r^2$$

$$V = \frac{4\pi{\cdot}r^3}{3}$$

Cilindro

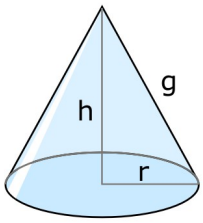


$$A_{TOTAL} = 2\pi\,r\,(h + r)$$

$$A_{BASES} = 2\pi\,r^2 \qquad A_{LATERAL} = 2\pi\,r{\cdot}h$$

$$V = \pi{\cdot}r^2{\cdot}h$$

Cono

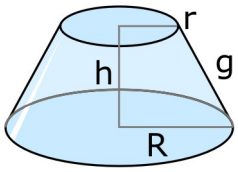


$$A_{TOTAL} = \pi\,r{\cdot}g + \pi\,r^2$$

$$A_{BASE} = \pi\,r^2 \qquad A_{LATERAL} = \pi\,r{\cdot}g$$

$$V = \frac{\pi\,r^2{\cdot}h}{3} \qquad g^2 = h^2 + r^2$$

Tronco de cono

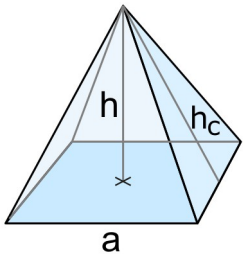


$$A_{TOTAL} = \pi\,[(r+R)\cdot g + r^2 + R^2]$$

$$A_{BASE\ MENOR} = \pi\, r^2 \qquad A_{BASE\ MAYOR} = \pi\, R^2 \qquad A_{LATERAL} = \pi\,(r+R)\cdot g$$

$$V = \frac{\pi \cdot h(R^2 + r^2 + r \cdot R)}{3} \qquad g^2 = h^2 + (R-r)^2$$

Pirámide

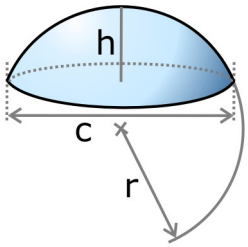


$$A_{TOTAL} = A_{LAT} + A_{BASE}$$

$$A_{LAT} = \frac{\text{Perímetro}_{BASE} \cdot h_C}{2}$$

$$V = \frac{A_{BASE} \cdot h}{3}$$

Segmento esférico

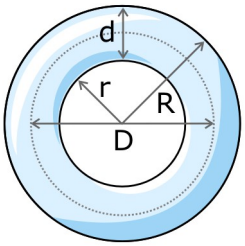


$$A_{TOTAL} = A_{SUP.CURVA} + A_{BASE}$$

$$A_{BASE} = \frac{\pi\, c^2}{4} \qquad A_{SUP.CURVA} = 2\pi\, r \cdot h = \frac{\pi}{4}\left(c^2 + 4h^2\right)$$

$$V = \frac{\pi}{6} h \left(\frac{3c^2}{4} + h^2\right) = \pi\, h^2 \left(r - \frac{h}{3}\right) \qquad r = \frac{h}{2} + \frac{c^2}{8h}$$

Toro

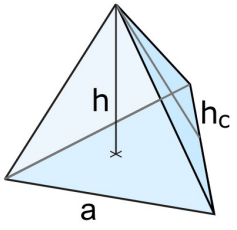


$$A = \pi^2 D \cdot d = \pi^2 (R^2 - r^2)$$

$$V = \frac{\pi^2}{4} D \cdot d^2 = \frac{\pi^2}{4} (R+r) \cdot (R-r)^2$$

$$D = R + r\,, \qquad d = R - r$$

Tetraedro

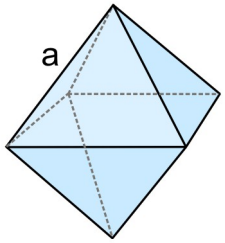


$$A = \sqrt{3}\, a^2$$

$$A_{CARA} = \frac{\sqrt{3}}{4} a^2 \qquad h_C = \frac{\sqrt{3}}{2} a \qquad h = \frac{\sqrt{6}}{3} a$$

$$V = \frac{\sqrt{2}}{12} a^3$$

Octaedro

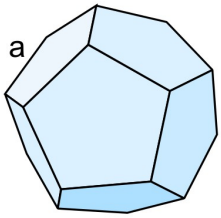


$$A = 2\sqrt{3}\,a^2$$

$$A_{CARA} = \frac{\sqrt{3}}{4}a^2$$

$$V = \frac{\sqrt{2}}{3}a^3$$

Dodecaedro

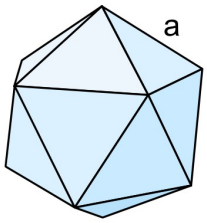


$$A = 3\sqrt{25+10\sqrt{5}}\,a^2$$

$$A_{CARA} = \frac{\sqrt{25+10\sqrt{5}}}{4}a^2$$

$$V = \frac{15+7\sqrt{5}}{4}a^3$$

Icosaedro



$$A = 5\sqrt{3}\,a^2$$

$$A_{CARA} = \frac{\sqrt{3}}{4}a^2$$

$$V = \frac{5}{12}\left(3+\sqrt{5}\right)a^3$$

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