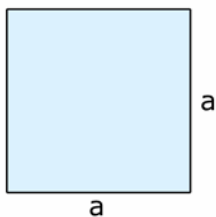


Área, perímetro y volumen de figuras del plano y del espacio

A = Área, P = Perímetro, V = Volumen

Figuras del plano

Cuadrado



$$A = a^2$$

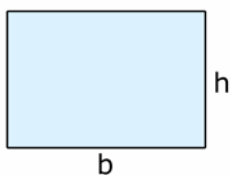
$$P = 4a$$

Ángulo interno $\alpha = 90^\circ$

Ángulo externo $\beta = 90^\circ$

Núm. diagonales $ND = 2$

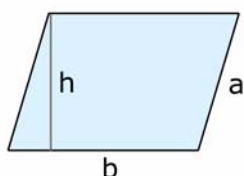
Rectángulo



$$A = b \cdot h$$

$$P = 2b + 2h$$

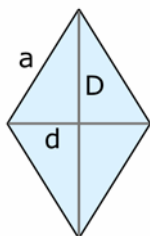
Paralelogramo



$$A = b \cdot h$$

$$P = 2b + 2a$$

Rombo

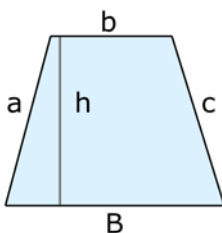


$$A = \frac{d \cdot D}{2}$$

$$P = 4a$$

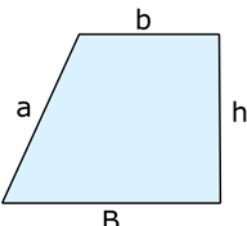
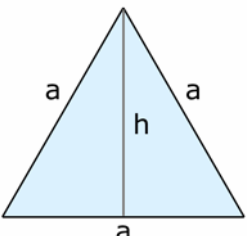
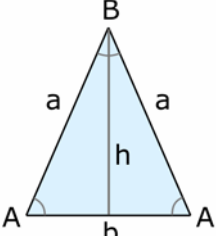
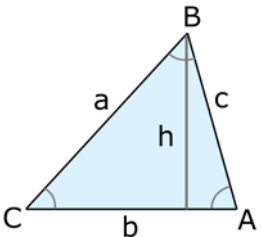
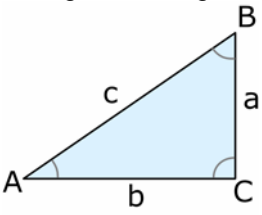
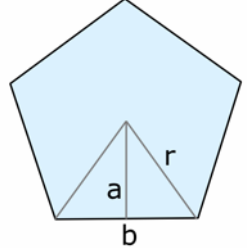
$$4a^2 = d^2 + D^2$$

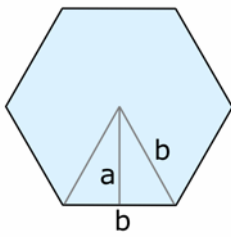
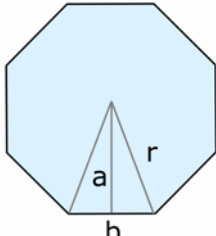
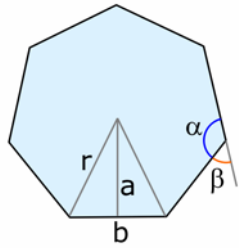
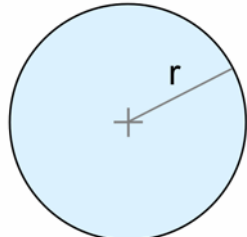
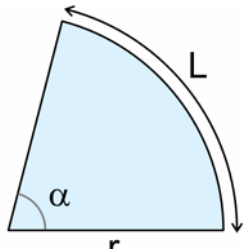
Trapecio



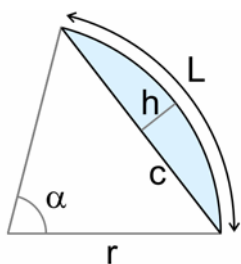
$$A = \frac{b + B}{2} h$$

$$P = a + b + B + c$$

<p>Trapezio recto</p> 	$A = \frac{b+B}{2}h$ $P = a + b + B + h$ $a^2 = (B - b)^2 + h^2$
<p>Triángulo equilátero</p> 	$A = \frac{a \cdot h}{2} = \frac{\sqrt{3}}{4}a^2$ $P = 3a$ $h = \frac{\sqrt{3}}{2}a$ <p>Ángulo interno $\alpha = 60^\circ$</p> <p>Ángulo externo $\beta = 120^\circ$</p> <p>Núm. diagonales $ND = 0$</p>
<p>Triángulo isósceles</p> 	$A = \frac{b \cdot h}{2} = \frac{a \cdot b \cdot \text{sen } A}{2}$ $P = 2a + b, \quad h = a \cdot \text{sen } A$ $4a^2 = 4h^2 + b^2$
<p>Triángulo escaleno</p> 	$A = \frac{b \cdot h}{2}$ $A = \sqrt{s(s-a)(s-b)(s-c)}$ $s = \frac{a+b+c}{2}$ $P = a + b + c$ $h = c \cdot \text{sen } A = a \cdot \text{sen } C$
<p>Triángulo rectángulo</p> 	$A = \frac{b \cdot a}{2}$ $P = a + b + c$ $c^2 = a^2 + b^2$ $a = c \cdot \text{sen } A = c \cdot \text{cos } B$ $b = c \cdot \text{sen } B = c \cdot \text{cos } A$
<p>Pentágono regular</p> 	$A = \frac{5a \cdot b}{2} = \frac{5}{8}r^2 \sqrt{10 + 2\sqrt{5}} = \frac{5}{2}r^2 \cdot \text{sen } 72^\circ$ $P = 5b$ $4r^2 = 4a^2 + b^2$ $b = \frac{r}{2} \sqrt{10 - 2\sqrt{5}} = 2r \cdot \text{sen } 36^\circ$ $a = \frac{r}{4} \sqrt{6 + 2\sqrt{5}} = r \cdot \text{cos } 36^\circ$ <p>Ángulo interno $\alpha = 108^\circ$</p> <p>Ángulo externo $\beta = 72^\circ$</p> <p>Núm. diagonales $ND = 5$</p>

<p>Hexágono regular</p> 	$A = \frac{3\sqrt{3}}{2}b^2 = 3b^2 \cdot \text{sen } 60^\circ$ $P = 6b$ $a = \frac{\sqrt{3}}{2}b = b \cdot \text{cos } 30^\circ$	<p>Ángulo interno $\alpha = 120^\circ$</p> <p>Ángulo externo $\beta = 60^\circ$</p> <p>Núm. diagonales $ND = 9$</p>
<p>Octágono regular</p> 	$A = 4 \cdot a \cdot b = 8 \cdot a^2 \cdot \tan 22,5^\circ = (8\sqrt{2} - 8)a^2 = \frac{2b^2}{\tan 22,5^\circ} = \frac{2b^2}{\sqrt{2} - 1}$ $P = 8 \cdot b = 16 \cdot a \cdot \tan 22,5^\circ$ $a = r \cdot \text{cos } 22,5^\circ$ $b = 2r \cdot \text{sen } 22,5^\circ$	<p>Ángulo interno $\alpha = 135^\circ$</p> <p>Ángulo externo $\beta = 45^\circ$</p> <p>Núm. diagonales $ND = 20$</p>
<p>Polígono regular de n lados</p> 	$A = \frac{n \cdot a \cdot b}{2} = n \cdot a^2 \cdot \tan \frac{180^\circ}{n}$ $P = n \cdot b = 2n \cdot a \cdot \tan \frac{180^\circ}{n}$ $a = r \cdot \text{cos } \frac{180^\circ}{n} \quad b = 2r \cdot \text{sen } \frac{180^\circ}{n}$	<p>Ángulo interno: $\alpha = \frac{(n-2) \cdot 180^\circ}{n}$</p> <p>Ángulo externo: $\beta = 180^\circ - \alpha$</p> <p>Núm. diagonales: $ND = \frac{n \cdot (n-3)}{2}$</p>
<p>Círculo</p> 	$A = \pi r^2$ $P = 2\pi r$	
<p>Sector circular</p> 	$A = \pi r^2 \frac{\alpha}{360^\circ}$ $L = \pi r \frac{\alpha}{180^\circ}$ $P = 2r + L$ <p>α en grados sexagesimales</p>	

Segmento circular



$$A = r^2 \left(\frac{\pi \alpha}{360^\circ} - \frac{\text{sen } \alpha}{2} \right)$$

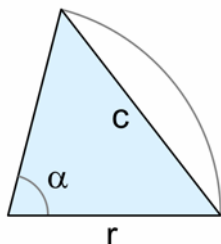
$$h = r \left(1 - \cos \frac{\alpha}{2} \right) \quad c = 2r \cdot \text{sen} \frac{\alpha}{2}$$

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

$$L = \pi r \frac{\alpha}{180^\circ}$$

α en grados sexagesimales

Triángulo circular



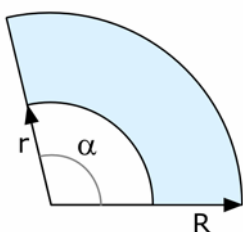
$$A = r^2 \frac{\text{sen } \alpha}{2}$$

$$c = 2r \cdot \text{sen} \frac{\alpha}{2}$$

$$P = 2r + c$$

α en grados sexagesimales

Trapezio circular

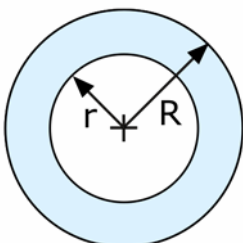


$$A = \pi (R^2 - r^2) \frac{\alpha}{360^\circ}$$

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

α en grados sexagesimales

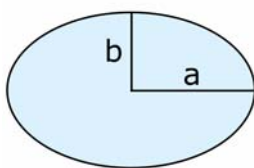
Corona circular



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

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

Elipse



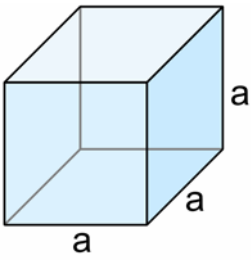
$$A = \pi a b$$

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

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

Figuras del espacio

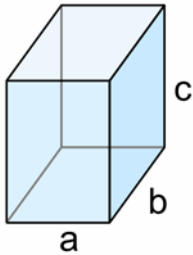
Cubo (hexaedro)



$$A = 6 a^2$$

$$V = a^3$$

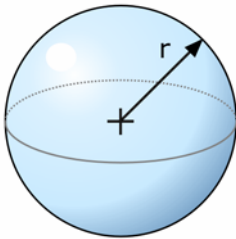
Prisma recto



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

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

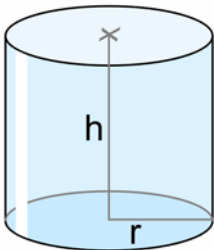
Esfera



$$A = 4\pi r^2$$

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

Cilindro



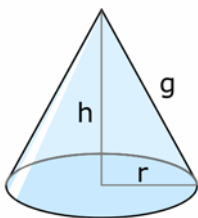
$$A_{TOTAL} = 2\pi r (h + r)$$

$$A_{BASES} = 2\pi r^2$$

$$A_{LATERAL} = 2\pi r \cdot h$$

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

Cono



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

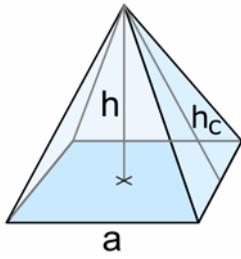
$$A_{BASE} = \pi r^2$$

$$A_{LATERAL} = \pi r \cdot g$$

$$V = \frac{\pi r^2 \cdot h}{3}$$

$$g^2 = h^2 + r^2$$

Pirámide

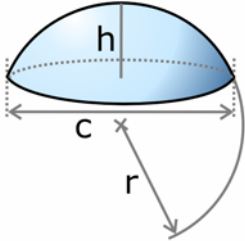


$$A_{TOTAL} = A_{LAT} + A_{BASE}$$

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

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

Segmento esférico

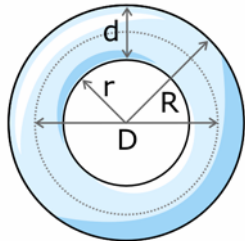


$$A_{TOTAL} = A_{SUP.CURVA} + A_{BASE}$$

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

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

Toro

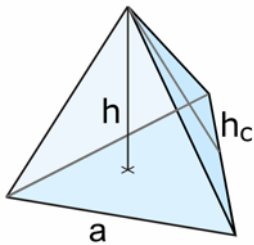


$$A = \pi^2 D \cdot d = \pi^2 (R^2 - r^2)$$

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

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

Tetraedro

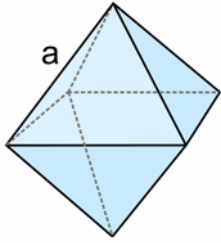


$$A = \sqrt{3} a^2$$

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

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

Octaedro

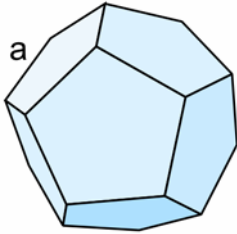


$$A = 2\sqrt{3} a^2$$

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

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

Dodecaedro

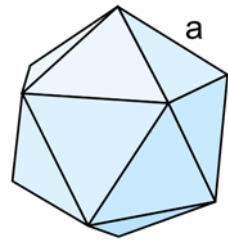


$$A = 3\sqrt{25 + 10\sqrt{5}} a^2$$

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

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

Icosaedro



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

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

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