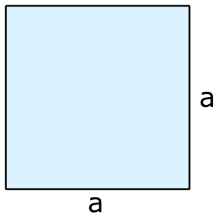
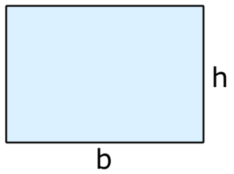
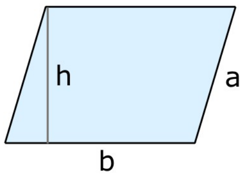
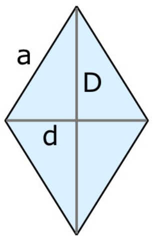
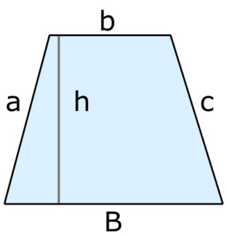
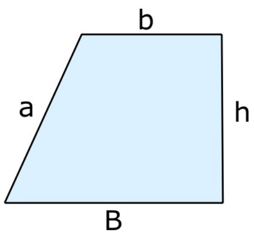
A = Area, S = Area, P = Perimeter, V = Volume

Plane shapes

Square 	$A = a^2$ $P = 4a$	Internal angle $\alpha = 90°$ External angle $\beta = 90°$ Number of diagonals $ND = 2$
Rectangle 	$A = b \cdot h$ $P = 2b + 2h$	
Parallelogram 	$A = b \cdot h$ $P = 2b + 2a$	
Rhombus 	$A = \frac{d \cdot D}{2}$ $P = 4a$ $4a^2 = d^2 + D^2$	
Trapezoid (trapezium) 	$A = \frac{b + B}{2} h$ $P = a + b + B + c$	

Right trapezoid

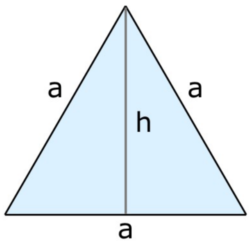


$$A = \frac{b+B}{2}h$$

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

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

Equilateral triangle



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

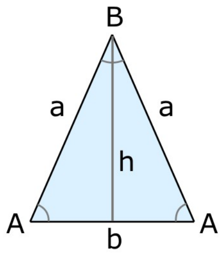
$$P = 3a\,, \qquad h = \frac{\sqrt{3}}{2}a$$

Internal angle $\alpha = 60°$

External angle $\beta = 120°$

Number of diagonals $ND = 0$

Isosceles triangle

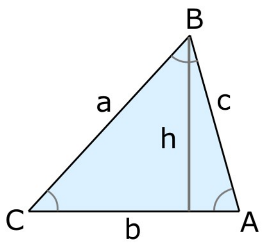


$$S = \frac{b \cdot h}{2} = \frac{a \cdot b \cdot \sin A}{2}$$

$$P = 2a + b\,, \qquad h = a \cdot \sin A$$

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

Scalene triangle

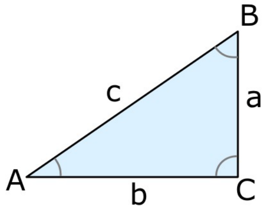


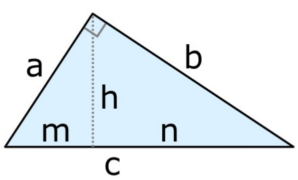
$$S = \frac{b \cdot h}{2}$$

$$P = a + b + c$$

$$h = c \cdot \sin A = a \cdot \sin C$$

Right triangle





$$S = \frac{b \cdot a}{2} \qquad a = c \cdot \mathrm{sen}\ A = c \cdot \cos B$$

$$P = a + b + c \qquad b = c \cdot \mathrm{sen}\ B = c \cdot \cos A$$

Pythagorean theorem

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

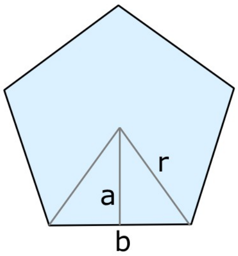
$$h^2 = m \cdot n$$

$$a^2 = m \cdot c$$

$$b^2 = n \cdot c$$

$$c = m + n$$

Regular pentagon



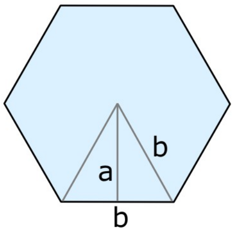
$$A=\frac{5a\cdot b}{2}=\frac{5}{8}r^2\sqrt{10+2\sqrt{5}}=\frac{5}{2}r^2\cdot\sin 72^\circ$$

$P=5b$ $\quad 4r^2=4a^2+b^2$ $\quad$ Internal angle $\alpha=108^\circ$

$b=\frac{r}{2}\sqrt{10-2\sqrt{5}}=2r\cdot\sin 36^\circ$ $\quad$ External angle $\beta=72^\circ$

$a=\frac{r}{4}\sqrt{6+2\sqrt{5}}=r\cdot\cos 36^\circ$ $\quad$ Number of diagonals $ND=5$

Regular hexagon

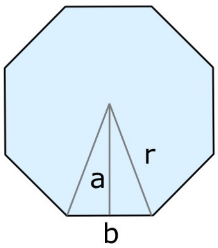


$A=\frac{3\sqrt{3}}{2}b^2=3b^2\cdot\sin 60^\circ$ $\quad$ Internal angle $\alpha=120^\circ$

$P=6b$ $\quad$ External angle $\beta=60^\circ$

$a=\frac{\sqrt{3}}{2}b=b\cdot\cos 30^\circ$ $\quad$ Number of diagonals $ND=9$

Regular octagon



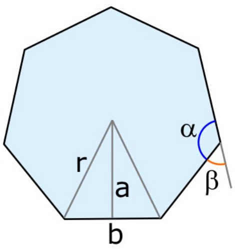
$$A=4\cdot a\cdot b=8\cdot a^2\cdot\tan 22.5^\circ=\left(8\sqrt{2}-8\right)a^2=\frac{2b^2}{\tan 22.5^\circ}=\frac{2b^2}{\sqrt{2}-1}$$

$P=8\cdot b=16\cdot a\cdot\tan 22.5^\circ$ $\quad$ Internal angle $\alpha=135^\circ$

$a=r\cdot\cos 22.5^\circ$ $\quad$ External angle $\beta=45^\circ$

$b=2r\cdot\sin 22.5^\circ$ $\quad$ Number of diagonals $ND=20$

Regular polygon (*n* sides)



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

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

$a=r\cdot\cos\frac{180^\circ}{n}$ $\quad b=2r\cdot\sin\frac{180^\circ}{n}$

Internal angle:

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

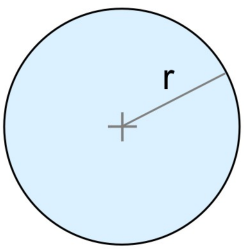
External angle:

$\beta=180^\circ-\alpha$

Number of diagonals:

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

Circle



$A=\pi r^2$

$P=2\pi r$

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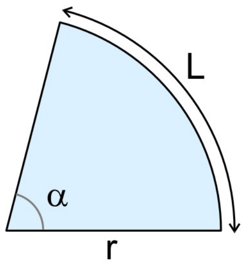
Circular sector



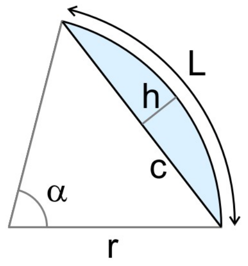
$$A = \pi r^2 \frac{\alpha}{360°}$$

$$L = \pi r \frac{\alpha}{180°}$$

$$P = 2r + L$$

α is expressed in sexagesimal degrees

Circular segment



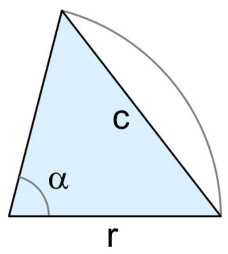
$$A = r^2 \left(\frac{\pi \cdot \alpha}{360°} - \frac{\sin \alpha}{2} \right)$$

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

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

α is expressed in sexagesimal degrees

Circular triangle

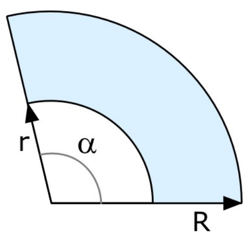


$$A = r^2 \frac{\sin \alpha}{2} \qquad c = 2r \cdot \sin\frac{\alpha}{2}$$

$$P = 2r + c$$

α is expressed in sexagesimal degrees

Circular trapezoid

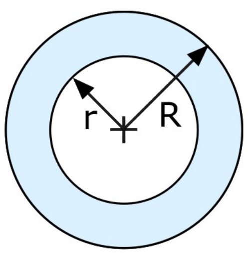


$$A = \pi \left(R^2 - r^2\right) \frac{\alpha}{360°}$$

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

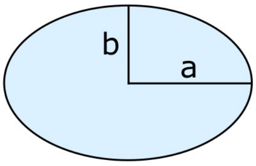
α is expressed in sexagesimal degrees

Annulus

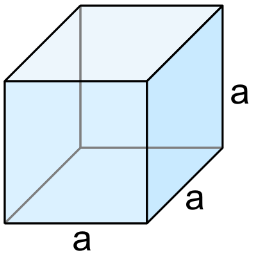
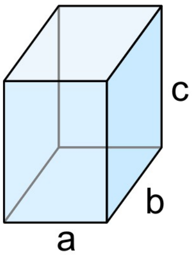
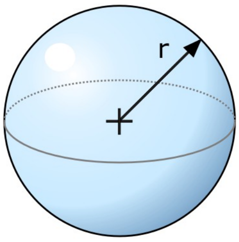
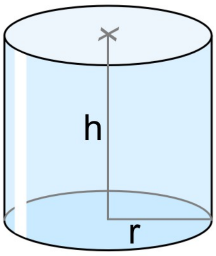


$$A = \pi \left(R^2 - r^2\right)$$

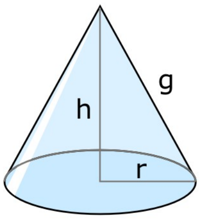
$$P = 2\pi (R + r)$$

Ellipse 	$A = \pi\, a \cdot b$ $P \cong \pi\,(a+b)$ $P = 4\int_0^{\pi/2} \sqrt{a^2 \sin^2 t + b^2 \cos^2 t}\; dt$

Solid shapes

Cube (hexahedron) 	$A = 6\, a^2$ $A_{FACE} = a^2$ $V = a^3$
Right prism 	$A = 2a \cdot b + 2a \cdot c + 2b \cdot c$ $V = a \cdot b \cdot c$
Sphere 	$A = 4\pi \cdot r^2$ $V = \dfrac{4\pi \cdot r^3}{3}$
Cylinder 	$A_{TOTAL} = 2\pi\, r\,(h+r)$ $A_{BASES} = 2\pi\, r^2$ $\qquad A_{LATERAL} = 2\pi\, r \cdot h$ $V = \pi \cdot r^2 \cdot h$

Circular cone

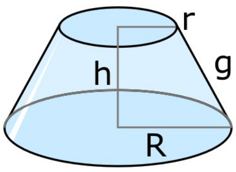


$$A_{TOTAL} = \pi\, r \cdot g + \pi\, r^2$$

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

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

Circular cone frustum

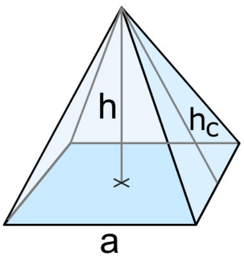


$$A_{TOTAL} = \pi\,[(r+R)\cdot g + r^2 + R^2]$$

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

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

Pyramid

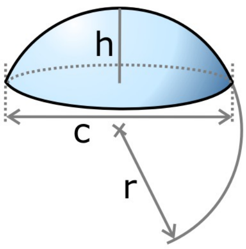


$$A_{TOTAL} = A_{LAT} + A_{BASE}$$

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

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

Spherical segment

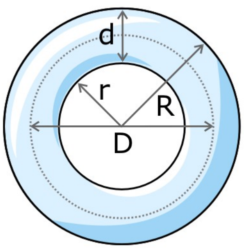


$$A_{TOTAL} = A_{LATERAL} + A_{BASE}$$

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

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

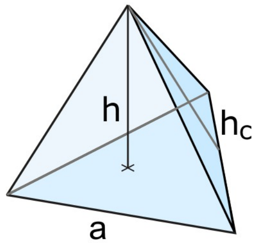
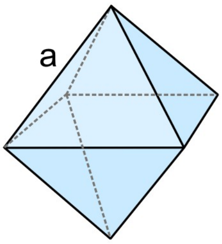
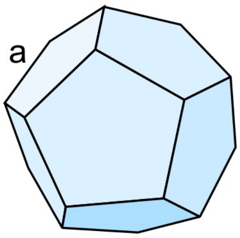
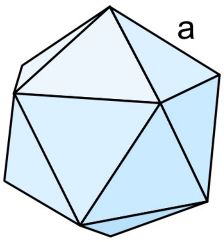
Torus



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

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

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

Tetrahedron 	$A = \sqrt{3}\, a^2$ $A_{FACE} = \frac{\sqrt{3}}{4} a^2$ $\quad h_C = \frac{\sqrt{3}}{2} a$ $\quad h = \frac{\sqrt{6}}{3} a$ $V = \frac{\sqrt{2}}{12} a^3$
Octahedron 	$A = 2\sqrt{3}\, a^2$ $A_{FACE} = \frac{\sqrt{3}}{4} a^2$ $V = \frac{\sqrt{2}}{3} a^3$
Dodecahedron 	$A = 3\sqrt{25 + 10\sqrt{5}}\, a^2$ $A_{FACE} = \frac{\sqrt{25 + 10\sqrt{5}}}{4} a^2$ $V = \frac{15 + 7\sqrt{5}}{4} a^3$
Icosahedron 	$A = 5\sqrt{3}\, a^2$ $A_{FACE} = \frac{\sqrt{3}}{4} a^2$ $V = \frac{5}{12}\left(3 + \sqrt{5}\right) a^3$