

Formulario di Geometria

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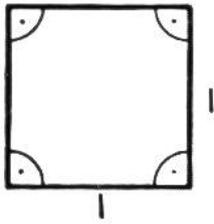
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Formulario di Geometria

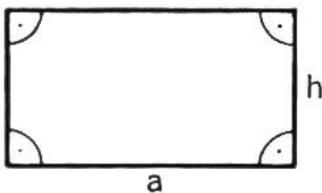


Il quadrato (lati uguali; angoli uguali)

l = lato p = perimetro A = area

$$p = 4l \quad l = \frac{p}{4} = p : 4$$

$$A = l \cdot l = l^2 \quad l = \sqrt{A}$$

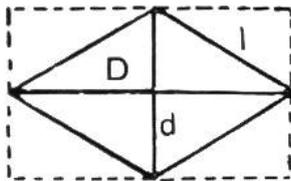


Il rettangolo (lati disuguali; angoli uguali)

a = lunghezza (base) h = larghezza (altezza)

$$p = 2(a + h) \quad a = \frac{p}{2} - h \quad h = \frac{p}{2} - a$$

$$A = ah \quad a = A : h \quad h = A : a$$



La losanga (lati uguali; angoli disuguali)

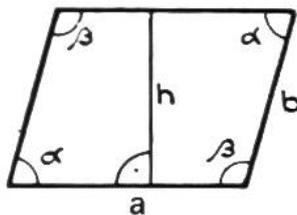
$$p = 4l \quad l = p : 4$$

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

Caso speciale del quadrato:

$$A = \frac{d \cdot d}{2} = \frac{d^2}{2} \quad d = \sqrt{2A}$$

l = lato D =
diagonale maggiore
 d = diagonale minore



Il romboide qualunque

(lati ed angoli disuguali)

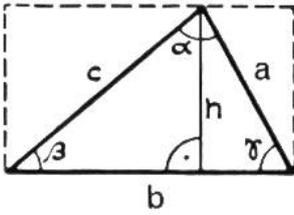
$$\alpha + \beta = 180^\circ$$

$$p = 2(a + b) \quad a = \frac{p}{2} - b \quad b = \frac{p}{2} - a$$

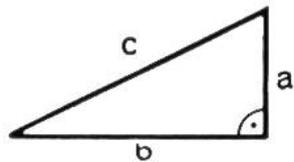
a = base h = altezza $A = ah$ $a = A : h$ $h = A : a$
 b = lato consecutivo alla base

Osservazione: Ricordare che il segno \times , quando non sia sostituito da \cdot è sempre da sottintendere e che il segno $\frac{\quad}{\quad}$ (fratto) vale il segno $:$

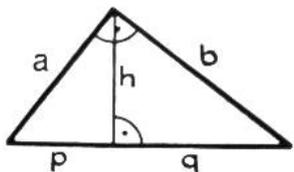
Per designare l'ampiezza di angoli (archi), solitamente, si ricorre a lettere dell'alfabeto greco: $\alpha, \beta, \gamma, \delta, \epsilon, \pi, \lambda, \omega, \dots$



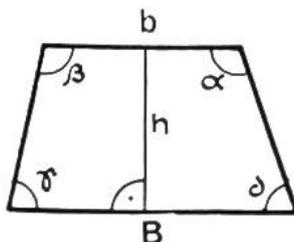
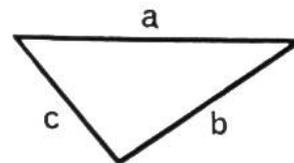
b = base
h = altezza



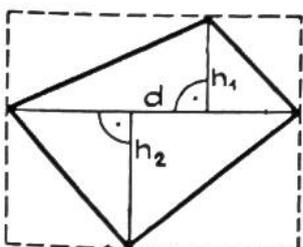
a, b = cateti
c = ipotenusa



c = p + q



h = altezza



Il triangolo

$$p = a + b + c$$

$$a = p - (b + c) \quad b = p - (a + c) \quad c = p - (a + b)$$

$$A = \frac{bh}{2} \quad b = \frac{2A}{h} \quad h = \frac{2A}{b}$$

$$\alpha + \beta + \gamma = 180^\circ \quad \alpha = 180^\circ - (\beta + \gamma)$$

$$\beta = 180^\circ - (\alpha + \gamma) \quad \gamma = 180^\circ - (\alpha + \beta)$$

Il teorema di Pitagora

$$c^2 = a^2 + b^2 \quad c = \sqrt{a^2 + b^2}$$

$$a^2 = c^2 - b^2 \quad a = \sqrt{c^2 - b^2} = \sqrt{(c + b)(c - b)}$$

$$b^2 = c^2 - a^2 \quad b = \sqrt{c^2 - a^2} = \sqrt{(c + a)(c - a)}$$

$$a^2 = cp \quad a = \sqrt{cp} \quad c = a^2 : p \quad p = a^2 : c$$

$$b^2 = cq \quad b = \sqrt{cq} \quad c = b^2 : q \quad q = b^2 : c'$$

$$h^2 = pq \quad h = \sqrt{pq} \quad p = h^2 : q \quad q = h^2 : p$$

Formola di Erone

a, b, c, lati del triangolo A = area

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

Il trapezio

B = base maggiore b = base minore

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

$$\alpha + \delta = \beta + \gamma = 180^\circ$$

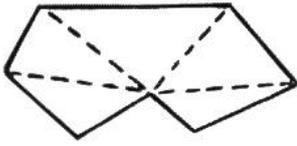
Il trapezoide

d = diagonale h₁, h₂ = altezze

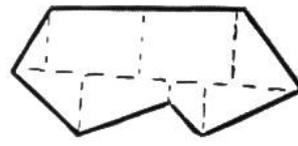
$$A = \frac{d(h_1 + h_2)}{2}$$

$$d = \frac{2A}{h_1 + h_2} \quad h_1 = \frac{2A}{d} - h_2 \quad h_2 = \frac{2A}{d} - h_1$$

Poligono qualunque



Scomposizione in triangoli



Sc. trapezi rett. e triang. rett.

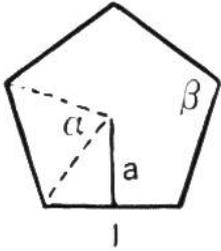
Poligono regolare

l = lato a = apotema n = numero dei lati

$$p = ln \quad l = p : n \quad n = p : l$$

$$A = \frac{pa}{2} \quad p = \frac{2A}{a} \quad a = \frac{2A}{p}$$

$$\alpha = \frac{360^\circ}{n} \quad \beta = 180^\circ - \alpha$$



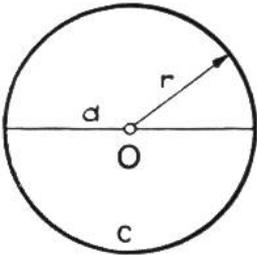
Il circolo

O = centro d = diametro r = raggio c = circonferenza

$$d = 2r \quad r = d : 2 \quad c : d = \pi \quad c = \pi d = 2 \pi r$$

$$d = c : \pi \quad r = \frac{c}{2\pi} \quad A = \pi r^2 = \frac{\pi d^2}{4} = \frac{c^2}{4\pi}$$

$$r = \sqrt{A : \pi} \quad d = 2 \sqrt{A : \pi} \quad c = 2 \sqrt{\pi A}$$

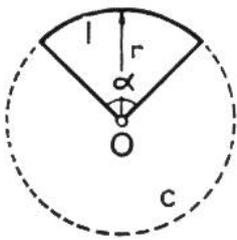


Settore circolare

l = lunghezza arco α = ampiezza settore

$$l = \frac{\alpha}{360} c = \frac{\alpha}{360} \pi d = \frac{\alpha}{180} \pi r \quad \alpha = \frac{360l}{c} = \frac{360l}{\pi d} = \frac{180l}{\pi r}$$

$$A = \frac{lr}{2} = \frac{\alpha}{360} \pi r^2 \quad l = \frac{2A}{r} \quad r = \frac{2A}{l} = 6 \sqrt{\frac{10A}{\pi \alpha}}$$



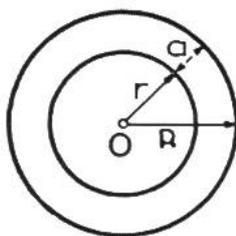
Corona circolare

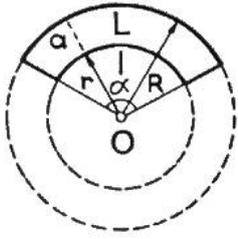
R, r = raggi D, d = diametri

$a = R - r$ = larghezza della corona

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

$$= \pi a (2r + a) = \pi a (d + a) = \pi a (2R - a) = \pi a (D - a)$$





$R, r =$ raggi

Settore di corona circolare

$L, l =$ lunghezza archi $\alpha =$ ampiezza del settore

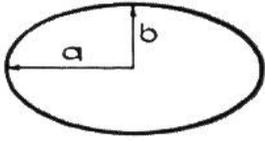
$a = R - r =$ larghezza della corona

$$A = \frac{L + l}{2} a = \frac{\alpha}{360} \pi (R^2 - r^2) = \frac{\alpha}{360} \pi (R + r) (R - r)$$

Ellisse

$a =$ semiasse maggiore $b =$ semiasse minore

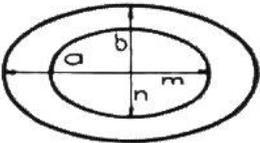
$$A = \pi a b \quad a = \frac{A}{\pi b} \quad b = \frac{A}{\pi a}$$



Corona ellittica

$a, b =$ semiassi ellisse maggiore

$m, n =$ semiassi ellisse minore $A = \pi (a b - m n)$



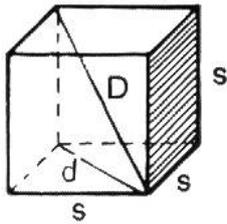
Il cubo

$s =$ spigolo $V =$ volume $A =$ area della superficie

$d =$ diagonale di una faccia $D =$ diagonale del cubo

$$d^2 = 2s^2 \quad d = s\sqrt{2} \quad D^2 = 3s^2 \quad D = s\sqrt{3}$$

$$A = 6s^2 \quad s = \sqrt{A:6} \quad V = s^3 \quad s = \sqrt[3]{V}$$



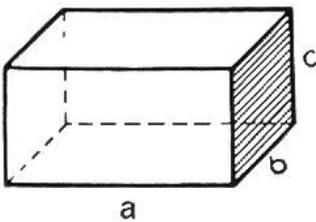
Il parallelepipedo rettangolo

$a, b, c =$ dimensioni $a, b =$ lati di base $c =$ altezza

$A_l =$ area laterale $A_t =$ area totale $V =$ volume

$$A_l = 2(a + b)c \quad A_t = 2c(a + b) + 2ab = 2(ab + ac + bc)$$

$$V = abc \quad a = \frac{V}{bc} \quad b = \frac{V}{ac} \quad c = \frac{V}{ab}$$



Il prisma retto

$p =$ perimetro di base $s =$ spigolo laterale $h =$ altezza

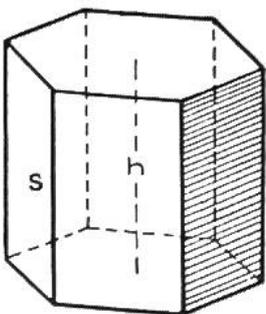
$B =$ area di base $A_l =$ area laterale $A_t =$ area totale

$V =$ volume

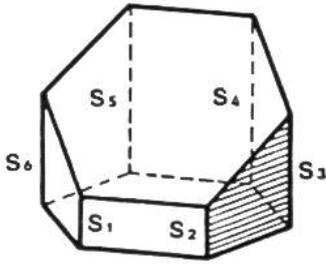
$$A_l = ps \quad p = \frac{A_l}{s} \quad s = \frac{A_l}{p}$$

$$A_t = A_l + 2B \quad B = (A_t - A_l) : 2$$

$$V = Bh \quad B = V : h \quad h = V : B$$



La formola del volume vale anche per il prisma obliquo

Tronco di prisma retto

S_1, S_2, \dots = spigoli laterali n = numero degli s B = area della base retta B' = area della base obliqua risp. agli s

$$A_l = p \frac{S_1 + S_2 + \dots + S_n}{n} \quad A_t = A_l + B + B'$$

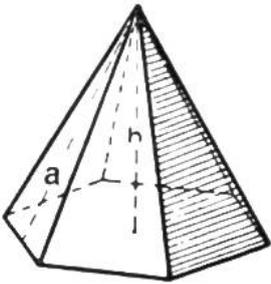
$$V = B \frac{S_1 + S_2 + \dots + S_n}{n}$$

La piramide retta

p = perimetro di base a = apotema B = area di base

$$A_l = \frac{p a}{2} \quad p = \frac{2 A_l}{a} \quad a = \frac{2 A_l}{p} \quad A_t = A_l + B$$

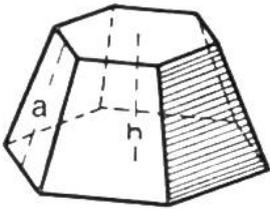
$$V = \frac{B h}{3} \quad B = \frac{3 V}{h} \quad h = \frac{3 V}{B}$$

**Tronco di piramide retta**

P, p = perimetri di base B, b = area delle basi a = apot.

$$A_l = \frac{P+p}{2} a \quad a = \frac{2 A_l}{P+p} \quad P = \frac{2 A_l}{a} - p \quad p = \frac{2 A_l}{a} - P$$

$$V = \frac{1}{3} h (B + b + \sqrt{Bb})$$

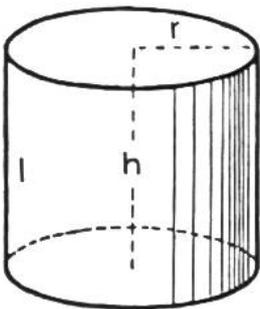
**Il cilindro retto**

r = raggio di base h = altezza l = lato

$$A_l = 2 \pi r l \quad l = \frac{A_l}{2 \pi r} \quad r = \frac{A_l}{2 \pi l} \quad A_t = 2 \pi r l + 2 \pi r^2 =$$

$$V = \pi r^2 h \quad h = \frac{V}{\pi r^2} \quad r = \sqrt{\frac{V}{\pi h}} = 2 \pi r (l + r)$$

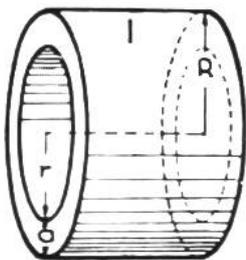
La formula del volume vale anche per il cilindro obliquo

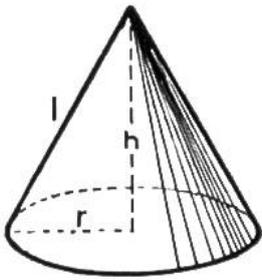
**Involucro cilindrico (tubo)**

D, d = diametri R, r = raggi l = lunghezza

$$V = \pi (R^2 - r^2) l = \pi l (R + r) (R - r) =$$

$$\frac{\pi}{4} (D^2 - d^2) l = \frac{\pi}{4} (D + d) (D - d)$$



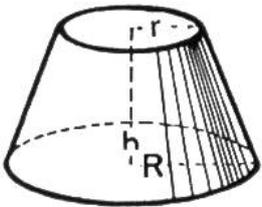


Il cono retto

r = raggio di base h = altezza l = lato o apotema

$$A_l = \pi r l \quad l = \frac{A_l}{\pi r} \quad r = \frac{A_l}{\pi l} \quad A_t = \pi r l + \pi r^2 = \pi r(l + r)$$

$$V = \frac{1}{3} \pi r^2 h \quad h = \frac{3V}{\pi r^2} \quad r = \sqrt{\frac{3V}{\pi h}}$$



Tronco di cono retto

$$A_l = \pi (R + r) l \quad l = \frac{A_l}{\pi (R + r)} \quad R = \frac{A_l}{\pi l} - r$$

$$r = \frac{A_l}{\pi l} - R \quad V = \frac{1}{3} \pi h (R^2 + r^2 + Rr)$$



La sfera

r = raggio d = diametro c = circonferenza massima

$$A = 4\pi r^2 = \pi d^2 = \frac{c^2}{\pi} \quad r = \sqrt{\frac{A}{4\pi}} \quad d = \sqrt{\frac{A}{\pi}} \quad c = \sqrt{\pi A}$$

$$V = \frac{4}{3} \pi r^3 = \frac{\pi}{6} d^3 \quad r = \sqrt[3]{\frac{3V}{4\pi}} \quad d = \sqrt[3]{\frac{6V}{\pi}}$$



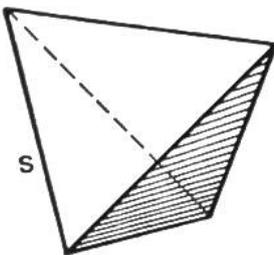
Involucro sferico

R, r = raggi delle 2 sfere D, d = diametri

$$V = \frac{4}{3} \pi (R^3 - r^3) = \frac{\pi}{6} (D^3 - d^3)$$

Poliedri regolari (cubo vedi altrove)

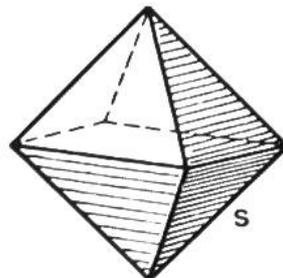
s = spigolo A = area della superficie V = volume



tetraedro

$$A = s^2 \cdot 1,732$$

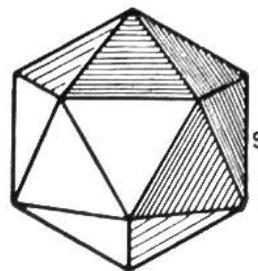
$$V = s^3 \cdot 0,1178$$



ottaedro

$$A = s^2 \cdot 3,4141$$

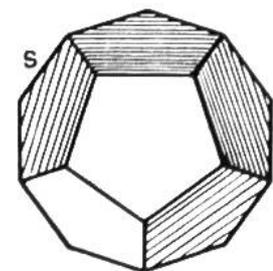
$$V = s^3 \cdot 0,4714$$



icosaedro

$$A = s^2 \cdot 8,6602$$

$$V = s^3 \cdot 2,1816$$



dodecaedro

$$A = s^2 \cdot 20,6457$$

$$V = s^3 \cdot 7,6631$$