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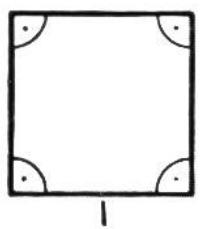
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# Formulario di Geometria

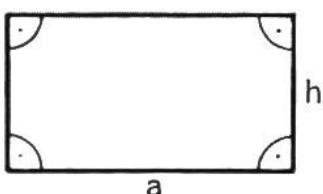


**Il quadrato** (lati uguali; angoli uguali)

$l$  = lato  $p$  = perimetro  $A$  = area

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

$$A = l \cdot l = l^2 \quad l = \sqrt[4]{A}$$

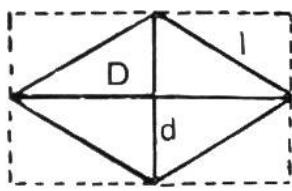


**Il rettangolo** (lati disuguali; angoli uguali)

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

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

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



$l$  = lato  $D$  = diagonale maggiore  
 $d$  = diagonale minore

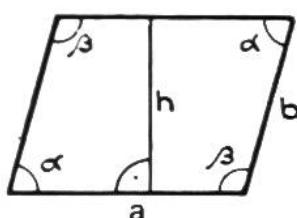
**La losanga** (lati uguali; angoli disuguali)

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

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

Caso speciale del quadrato:

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



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

**Il romboide qualunque**

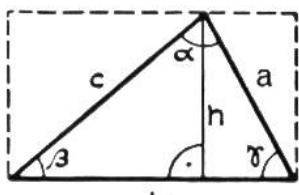
(lati ed angoli disuguali)

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

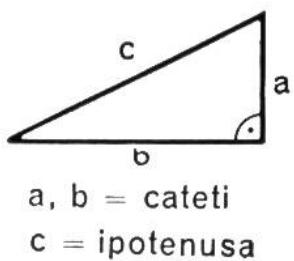
$$p = 2(a + b) \quad a = \frac{p}{2} - b \quad b = \frac{p}{2} - a$$

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

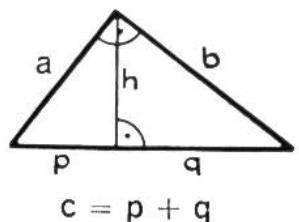
Per designare l'ampiezza di angoli (archi), solitamente, si ricorre a lettere dell'alfabeto greco:  $\alpha, \beta, \gamma, \delta, \varepsilon, \pi, \lambda, \omega, \dots$



$b$  = base  
 $h$  = altezza



$a, b$  = cateti  
 $c$  = ipotenusa



$c = p + q$

## 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

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

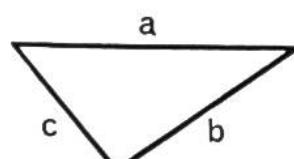
$$a^2 = c^2 - b^2 \quad a = \sqrt{c^2 - b^2} = \sqrt{(c+b)(c-b)}$$

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

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

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

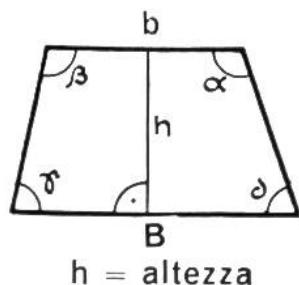
$$h^2 = pq \quad h = \sqrt{pq} \quad p = h^2 : q \quad q = h^2 : p$$



## Formola di Erone

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

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



$h$  = altezza

## Il trapezio

$B$  = base maggiore  $b$  = base minore

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

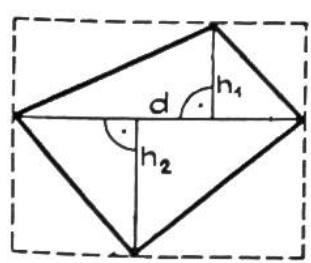
$$\alpha + \delta = \beta + \gamma = 180^\circ$$

## Il trapezoide

$d$  = diagonale  $h_1, h_2$  = altezze

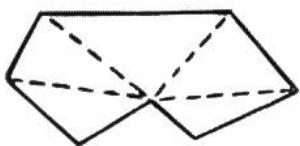
$$A = \frac{d(h_1 + h_2)}{2}$$

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

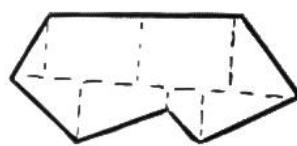


## Poligono qualunque

Tav. 3

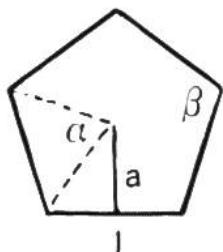


Scomposizione in triangoli



Sc. trapezi rett. e triang. rett.

## Poligono regolare



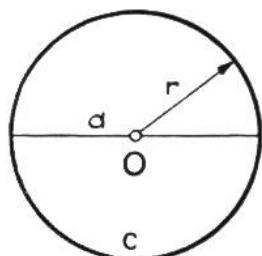
$l$  = lato     $a$  = apotema     $n$  = numero dei lati

$p = ln$      $l = p : n$      $n = p : l$

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

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

## Il circolo



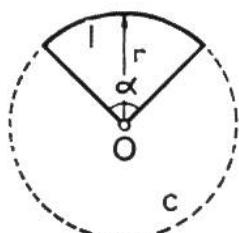
$O$  = centro     $d$  = diametro     $r$  = raggio     $c$  = circonferenza

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

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

$$r = \sqrt[4]{A : \pi} \quad d = 2\sqrt[4]{A : \pi} \quad c = 2\sqrt[4]{\pi A}$$

## Settore circolare

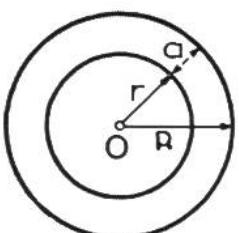


$l$  = lunghezza arco     $a$  = ampiezza settore

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

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

## Corona circolare

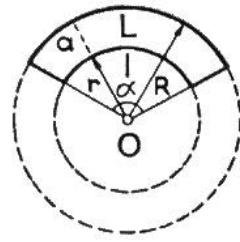


$R, r$  = raggi     $D, d$  = diametri

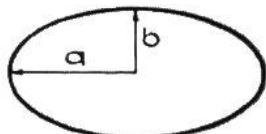
$a = R - r$  = larghezza della corona

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

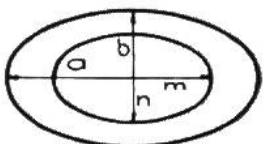
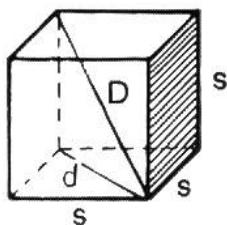
$$= \pi a (2r + a) = \pi a (d + a) = \pi a (2R - a) = \pi a (D - a)$$

 $R, r$  = raggi**Settore di corona circolare** $L, l$  = lunghezza archi  $a$  = ampiezza del settore $a = R - r$  = larghezza della corona

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

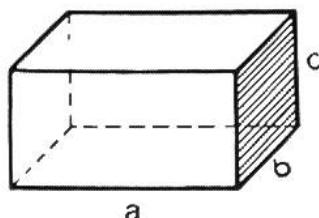
**Ellisse** $a$  = semiasse maggiore  $b$  = semiasse minore

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

**Corona ellittica** $a, b$  = semiassi ellisse maggiore $m, n$  = semiassi ellisse minore  $A = \pi (ab - mn)$ **Il cubo** $s$  = spigolo  $V$  = volume  $A$  = area della superficie $d$  = diagonale di una faccia  $D$  = diagonale del cubo

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

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

**Il parallelepipedo rettangolo** $a, b, c$  = dimensioni  $a, b$  = lati di base  $c$  = altezza $A_l$  = area laterale  $A_t$  = area totale  $V$  = volume

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

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

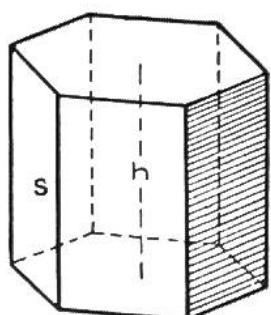
**Il prisma retto** $p$  = perimetro di base  $s$  = spigolo laterale  $h$  = altezza $B$  = area di base  $A_l$  = area laterale  $A_t$  = area totale $V$  = volume

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

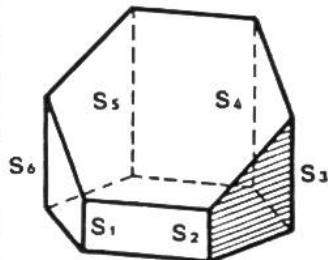
$$A_t = A_l + 2B \quad B = (A_t - A_l) : 2$$

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

La formula del volume vale anche per il prisma obliquo



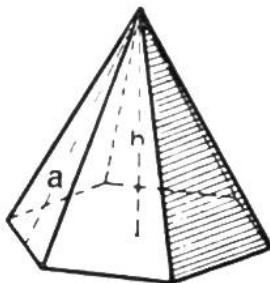
## Tronco di prisma retto



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

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

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

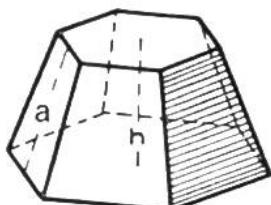


## La piramide retta

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

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

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

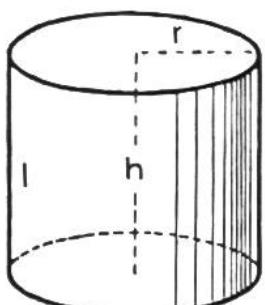


## Tronco di piramide retta

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

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

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



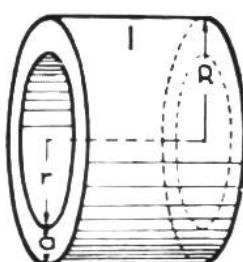
## Il cilindro retto

$r$  = raggio di base  $h$  = altezza  $l$  = lato

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

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

La formula del volume vale anche per il cilindro obliquio

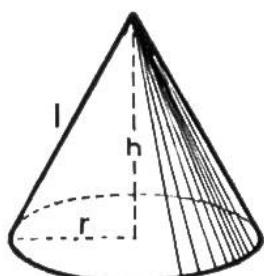


## Involucro cilindrico (tubo)

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

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

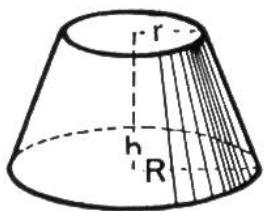
$$\frac{\pi}{4}(D^2 - d^2)l = \frac{\pi}{4}(D + d)(D - d)$$

**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**

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

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



$r$  = raggio    $d$  = diametro    $c$  = circonferenza massima

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

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

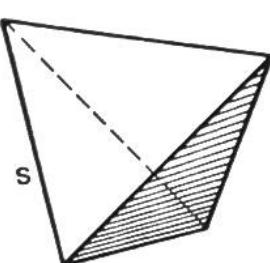
**Invólucro sferico**

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

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

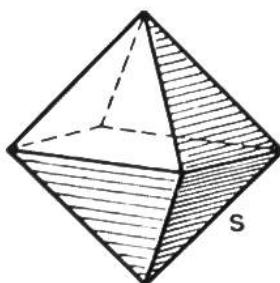
**Poliedri regolari** (cubo vedi altrove)

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

**tetraedro**

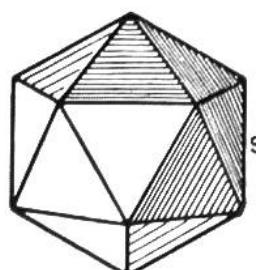
$$A = s^2 \cdot 1,732$$

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

**ottaedro**

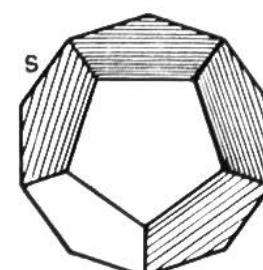
$$A = s^2 \cdot 3,4141$$

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

**icosaedro**

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

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

**dodecaedro**

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

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