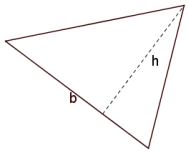
Triangolo



P= $l_1+l_2+l_3$

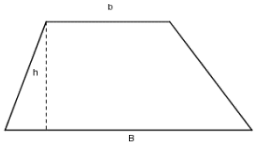
$A = \frac{b.h}{2}$ $h = \frac{2A}{b}$; $b = \frac{2A}{h}$

Triangolo equilatero:

$\mathbf{h = \frac{\ell\sqrt{3}}{2}}$

$\mathbf{A = \frac{\ell^2\sqrt{3}}{4}}$

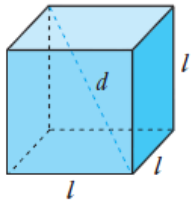
Trapezio



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

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

Cubo



$A_l = 4.l^2$

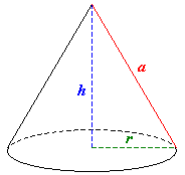
$A_t = 6.\ l^2$

$l = \sqrt{\frac{A_t}{6}}$

$V = l^3$

$l = \sqrt[3]{V}$

Cono



A_l= a rπ

$r = \frac{A_l}{a.\pi}$; $a = \frac{A_l}{r.\pi}$

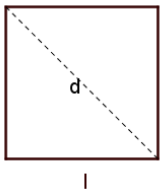
$A_t = A_l + A_b$

A_t = a r$\pi + r^2\pi$

$V = \frac{A_b.h}{3}$

$h = \frac{3V}{A_b}$ $A_b = \frac{3V}{h}$

Quadrato



P = 4l

$A = l^2$

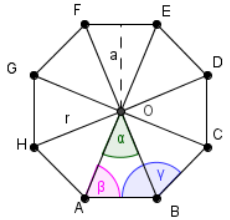
$A = \frac{d^2}{2}$

$l = \sqrt{A}$

$d = \sqrt{2A}$

$\mathbf{d = \ell\sqrt{2}}$

Poligono regolare di n lati.



P = l . n

$A = \frac{P.a}{2}$ $P = \frac{2A}{a}$

$a = \frac{2A}{P}$ $f = \frac{a}{l}$

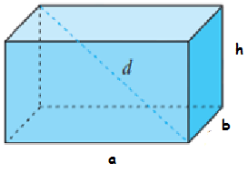
$\alpha = \frac{360°}{n}$; $\gamma = 2\beta$

β= (180°- α):2;

Somma angoli interni:

(n -2) . 180°

Parallelepipedo rettangolo



A_l =2(a+b). h

oppure

A_l = p . h

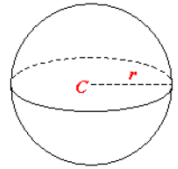
$A_t = A_l + 2.\ A_b$

$V = A_b$. h

$h = \frac{V}{A_b}$;

$A_b = \frac{V}{h}$

Sfera

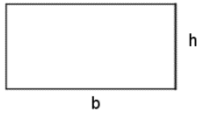


$A = 4r^2\pi$

$r = \sqrt{\frac{A}{4\pi}}$

$V = \frac{4}{3}r^3\pi$ $r = \sqrt[3]{\frac{3\,V}{4\pi}}$

Rettangolo



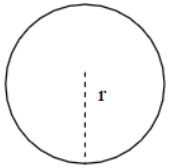
P =2.(b +h)

A = b. h

$b = \frac{A}{h}$

$h = \frac{A}{b}$

Circonferenza Cerchio



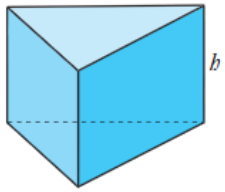
C = 2rπ

$r = \frac{C}{2\pi}$

$A = r^2\pi$

$r = \sqrt{\frac{A}{\pi}}$

Prisma retto



A_l = p . h

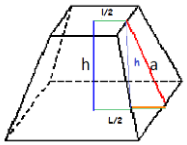
$A_t = A_l + 2.\ A_b$

$V = A_b$. h

$h = \frac{V}{A_b}$

$A_b = \frac{V}{h}$

Tronco di piramide



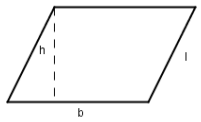
$a = \sqrt{h^2 + (L/2 - l/2)^2}$

$A_l = \frac{(P+p)}{2}.\ a$

$A_t = A_l + A_B + A_b$

$V = \frac{(A_B + A_b + \sqrt{A_B\ A_b})}{3}.h$

Parallelogramma

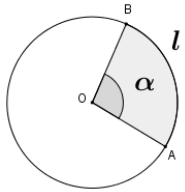


P =2.(b +l)

A = b. h

$b = \frac{A}{h}$; $h = \frac{A}{b}$

Settore Circolare

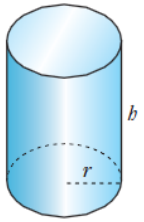


Parte $\frac{\alpha}{360}$

$\ell = \frac{\alpha}{360}.2r\pi$ $\frac{\alpha}{180}r\,\pi$

$A = \frac{\alpha}{360}.r^2\pi$

Cilindro



$A_l = 2r\pi$. h

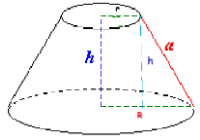
$A_t = A_l + 2.\ A_b$

$V = r^2\pi$. h

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

$A_b = \frac{V}{h}$

Tronco di cono



$a = \sqrt{h^2 + (R-r)^2}$

$A_l = \frac{(C+c)}{2}.\ A_t$ *oppure*

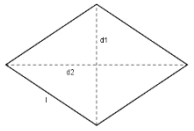
$A_l = (R+r).\pi.\ a$

$A_t = A_l + A_B + A_b$

$V = \frac{(R^2 + r^2 + R.r)\,\pi}{3}.h$

$\alpha = \frac{r}{a}360°$

Rombo



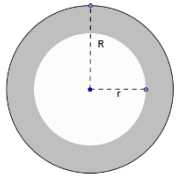
P = 4l

$A = \frac{d_1.d_2}{2}$

$d_1 = \frac{2A}{d_2}$

$d_2 = \frac{2A}{d_1}$

Corona Circolare

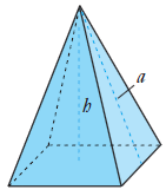


$A = R^2\pi - r^2\pi$

Che posso scrivere

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

Piramide



$A_l = \frac{p\ .\ a}{2}$

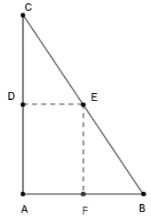
$a = \frac{2A_l}{P}$;

$P = \frac{2A_l}{a}$; $A_t = A_l + A_b$

$V = \frac{A_b.h}{3}$

$h = \frac{3V}{A_b}$ $A_b = \frac{3V}{h}$

Similitudine.



$\frac{AB}{AC} = \frac{DE}{DC}$; $\frac{AB}{BC} = \frac{DE}{CE}$;

$\frac{AB}{BC} = \frac{DE}{CE}$;

$\frac{AB}{DE} = \frac{BC}{CE}$;

Proprietà delle potenze.

$a^n \cdot a^m = a^{n+m}$

$a^m : a^n = a^{m-n}$; oppure $\frac{a^m}{a^n} = a^{m-n}$

$(a^m)^n = a^{m \cdot n}$

$a^n \cdot b^n = (a \cdot b)^n$

$a^n : b^n = (a : b)^n$ oppure $\frac{a^n}{b^n} = \left(\frac{a}{b}\right)^n$

Potenze ad esponente intero: $a^{-n} = \left(\frac{1}{a}\right)^n$

es: $\left(-\frac{3}{4}\right)^{-2} = \left(-\frac{4}{3}\right)^2 = \frac{16}{9}$ attenzione:

$\left(+\frac{16}{9}\right)^{-2} = \left[\frac{4}{3}\right]^{-4} = \left[\frac{3}{4}\right]^4 = \frac{3^4}{4^4} = \frac{81}{256}$; $\frac{2^{-3}}{5^{-2}} = \frac{5^2}{2^3}$; $\frac{a^{-2}}{b^{-3}} = \frac{b^3}{a^2}$

Radicali

Proprietà per $n; m \in \mathbb{N}^* \; e \; a; b \in \mathbb{R}$.

$\sqrt[n]{a} = \sqrt[m.n]{a^m}$; $\left(\sqrt[n]{a}\right)^m = \sqrt[n]{a^m}$;

particolarità $\left(\sqrt[n]{a}\right)^n = \sqrt[n]{a^n} = a$;

$\sqrt[n]{a.b} = \sqrt[n]{a} \cdot \sqrt[n]{b}$;

$\sqrt[n]{a:b} = \sqrt[n]{a} : \sqrt[n]{b}$ oppure $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

Estrarre un fattore dal segno di radice.

$\sqrt[n]{c^n.a} = \sqrt[n]{c^n} \cdot \sqrt[n]{a} = c.\sqrt[n]{a}$

Radice di radice. $\sqrt[n]{\sqrt[m]{a}} = \sqrt[n.m]{a}$

Radicali e potenza: $\sqrt[n]{a^m} = a^{\frac{m}{n}}$

Razionalizzare: $\frac{m}{\sqrt{a}} = \frac{m.\sqrt{a}}{\sqrt{a}.\sqrt{a}} = \frac{m.\sqrt{a}}{a}$

Disequazioni.

$x \geq -2$; $x \in [-2; +\infty[$; $x > -3$; $x \in]-3; +\infty[$

$-x \geq -4$; $x \leq +4$

Equazione fratte. V.E $x \neq 2$

$\frac{1}{x-2} = 1$

Prodotti notevoli.

Somma per la differenza: $(a + b) \cdot (a - b) = a^2 - b^2$

Quadrato di un binomio: $(a + b)^2 = a^2 + 2ab + b^2$

$(a - b)^2 = a^2 - 2ab + b^2$

Quadrato di un trinomio: $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc$

Cubo di un binomio: $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$

Scomposizione in fattori.

Raccoglimento a fattor comune: $a^2 + ab + ac + ad = a.(a + b + c)$

Raccoglimento parziale: $ax + bx + ay + by = x.(a + b) + y.(a + b) = (a + b).(x + y)$

Differenza di quadrati: $a^2 - b^2 = (a + b) \cdot (a - b)$

Somma di quadrati : $a^2 + b^2$ = non è scomponibile!

Quadrato di un binomio: $a^2 + 2ab + b^2 = (a + b)^2$

$a^2 - 2ab + b^2 = (a - b)^2$

Cubo di un binomio: $a^3 + 3a^2b + 3ab^2 + b^3 = (a + b)^3$

$a^3 - 3a^2b + 3ab^2 - b^3 = (a - b)^3$

Differenza di cubi : $a^3 - b^3 = (a - b) \cdot (a^2 + ab + b^2)$

Somma di cubi : $a^3 + b^3 = (a + b) \cdot (a^2 - ab + b^2)$

Trinomio tipico: $x^2 + sx + p = (x + n) \cdot (a + m)$; dove $s = m + n$; $p = n \cdot m$

Es. $x^2 + 7x + 12 = (x + 3) \cdot (x + 4)$; dove $7 = 4 + 3$; $12 = 4.3$

Frazioni algebriche.

$\frac{n}{a-b} + \frac{m}{b-a} = \frac{n}{a-b} - \frac{m}{a-b} = \frac{n-m}{a-b}$; $\left(\frac{a+b}{x-y}\right)^{-1} = \frac{x-y}{a+b}$

Sistemi d'equazioni.

Metodo di sostituzione

$\begin{cases} x + y = 12 \\ x - y = 4 \end{cases}$

$\begin{cases} x = 12 - y \\ 12 - y - y = 4 \end{cases}$

$\begin{cases} x = 12 - y \\ 12 - y - y = 4 \end{cases}$

$\begin{cases} x = 12 - y \\ -2y = 4 - 12 \end{cases}$

$\begin{cases} x = 12 - y \\ y = 4 \end{cases}$

$\begin{cases} x = 8 \\ y = 4 \end{cases}$

Sist. Det S = $\{(8; 4)\}$

Metodo di confronto

$\begin{cases} x + y = 12 \\ x - y = 4 \end{cases}$

$\begin{cases} x = 12 - y \\ x = y + 4 \end{cases}$

$12 - y = y + 4$

$-2y = -8$

$y = 4$

$x = 8$

Sist. Det S = $\{(8; 4)\}$

Metodo addizione /sottrazione

$\begin{cases} x + y = 12 \\ x - y = 4 \end{cases}$

$2x + 0y = 16$

$2x = 16$

$x = 8$

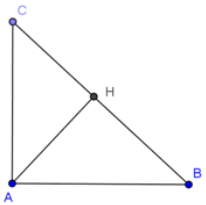
$8 + y = 12$

$y = 4$

Sist. Det S = $\{(8; 4)\}$

Teoremi di Euclide:

Triangoli simili



Primo teorema: cateti e proiezioni.

$\frac{|AC|}{|BC|} = \frac{|CH|}{|AC|}$ da cui segue

$|AC|^2 = |BC| \cdot |CH|$ ======>

$|\boldsymbol{AC}| = \sqrt{|\boldsymbol{BC}| \cdot |\boldsymbol{CH}|}$

Oppure $\frac{|AB|}{|BC|} = \frac{|BH|}{|AB|}$ da cui segue

$|AB|^2 = |BC| \cdot |BH|$ ======>

$|\boldsymbol{AB}| = \sqrt{|\boldsymbol{BC}| \cdot |\boldsymbol{BH}|}$

Secondo teorema: altezza

$\frac{|AH|}{|BH|} = \frac{|CH|}{|AH|}$ da cui segue

$|AH|^2 = |BH| \cdot |CH|$ ======>

$|\boldsymbol{AH}| = \sqrt{|\boldsymbol{BH}| \cdot |\boldsymbol{CH}|}$

Teorema di Pitagora:

$|BC|^2 = |AB|^2 + |AC|^2$ ==== ➔

$|\boldsymbol{BC}| = \sqrt{|\boldsymbol{AB}|^2 + |\boldsymbol{AC}|^2}$

Da cui segue: $|AB|^2 = |BC|^2 - |AC|^2$

==> $|\boldsymbol{AB}| = \sqrt{|\boldsymbol{BC}|^2 - |\boldsymbol{AC}|^2}$ e

$|AC|^2 = |BC|^2 - |AB|^2$ ======>

$|\boldsymbol{AC}| = \sqrt{|\boldsymbol{BC}|^2 - |\boldsymbol{AB}|^2}$

Insiemi numerici:

Numeri Naturali; N= {0;1;2;3 ...; ∞}

Numeri Interi Relativi; Z {...;-3:-2;-1;0;1;2;3; ...; ∞}

Numeri Razionali; Q={.....- 7/2; -3/4;0 ; +1/2;+9/4;}

Numeri Irrazionali;I= {-√7; -∛(12/5) ;0 ;,+∛12 ;};

Numeri Reali; R; R=I ∪ Q