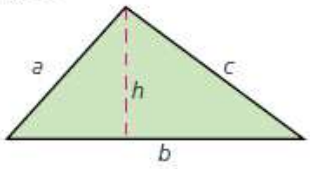
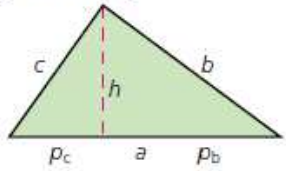
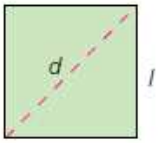
FORMULARIO DI GEOMETRIA

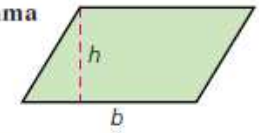
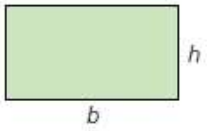
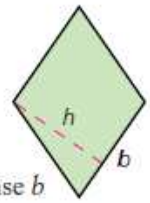
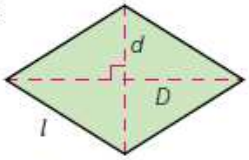
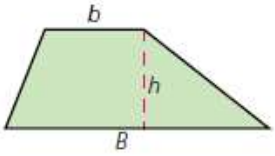
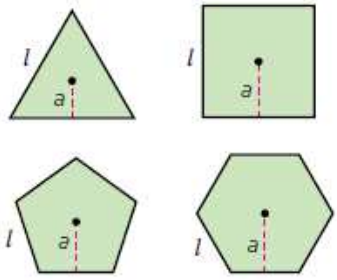
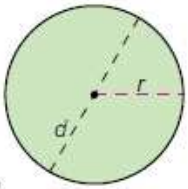
(a cura Prof.ssa S. Casalena)

Il calcolo del perimetro, dell'area e dei volumi delle principali figure geometriche (poligoni) è un operazione spesso necessaria per risolvere problemi operativi nell'ambito delle scienze applicate.
Di seguito sono riportate:

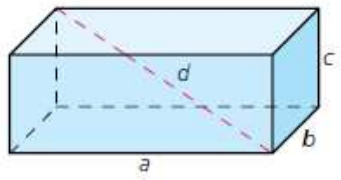
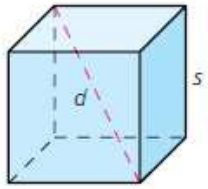
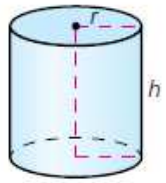
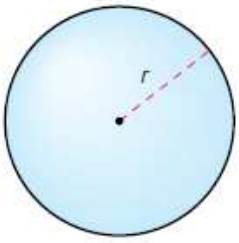
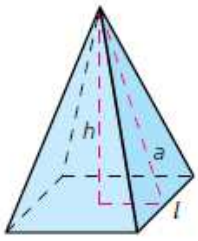
- le caratteristiche dei principali poligoni
- le formule per la determinazione del perimetro e dell'area dei poligoni piani
- le formule per la determinazione dei volumi dei poligoni solidi
- le formule inverse e altre formule utili alla determinazione di alcune grandezze correlate

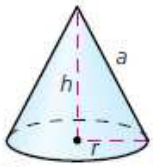
Geometria piana

Poligono	Formule dirette	Formule inverse
Triangolo  a, b, c: lati h: altezza relativa alla base b p: perimetro	$A = \frac{b \cdot h}{2}$ $\quad p = a + b + c$	$b = \frac{A \cdot 2}{h}$ $h = \frac{A \cdot 2}{b}$
Triangolo rettangolo  a: ipotenusa b, c: cateti h: altezza relativa all'ipotenusa p_c e p_b: proiezioni dei cateti sull'ipotenusa	$A = \frac{a \cdot h}{2}$ oppure $A = \frac{b \cdot c}{2}$ Teorema di Pitagora: $a = \sqrt{b^2 + c^2}$	$b = \sqrt{a^2 - c^2}$ $c = \sqrt{a^2 - b^2}$
Quadrato  l: lato d: diagonale	$A = l^2$ oppure $A = \frac{d^2}{2}$ $d = l \cdot \sqrt{2}$ oppure, approssimando $d = l \cdot 1{,}4142$	$l = \sqrt{A}$ $d = \sqrt{A \cdot 2}$ $l = \frac{d}{\sqrt{2}}$ oppure, approssimando $l = \frac{d}{1{,}4142}$

Poligono	Formule dirette	Formule inverse
Parallelogramma **Rettangolo** **Rombo**    b: base h: altezza relativa alla base b	$A = b \cdot h$	$b = \frac{A}{h}$ $\quad h = \frac{A}{b}$
Rombo  d: diagonale minore D: diagonale maggiore l: lato	$A = \frac{d_1 \cdot d_2}{2}$ $l = \sqrt{\left(\frac{d}{2}\right)^2 + \left(\frac{D}{2}\right)^2}$	$d_1 = \frac{2 \cdot A}{d_2}$ $\quad d_2 = \frac{2 \cdot A}{d_1}$ $\frac{d}{2} = \sqrt{l^2 - \left(\frac{D}{2}\right)^2}$
Trapezio  b: base minore B: base maggiore h: altezza	$A = \frac{(B + b) \cdot h}{2}$	$h = \frac{2 \cdot A}{B + b}$ $\quad B + b = \frac{2 \cdot A}{h}$
Poligono regolare  a: apotema l: lato n: numero di lati f: numero fisso	$a = l \cdot f$ $A = \frac{p \cdot a}{2}$ oppure $A = \frac{n \cdot l^2 \cdot f}{2}$	$a = \frac{A \cdot 2}{p}$ $\quad p = \frac{A \cdot 2}{a}$
Circonferenza e cerchio  r: raggio d: diametro	$C = \pi \cdot d = 2 \cdot \pi \cdot r$ $A = \pi \cdot r^2$	$d = \frac{C}{\pi}$ $\quad r = \frac{C}{2\pi}$ $r = \sqrt{\frac{A}{\pi}}$

Geometria solida

Solido	Formule dirette	Formule inverse
Parallelepipedo rettangolo 	$A_l = p_b h$ oppure $A_l = 2(ab + bc)$ $A_t = A_l + 2A_b$ oppure $A_t = 2(ab + ac + bc)$ $V = abc$ oppure $V = A_b h$ $d = \sqrt{a^2 + b^2 + c^2}$	$p_b = \frac{A_l}{h}$ $h = \frac{A_l}{p_b}$ $A_l = A_t - 2A_b$ $A_b = \frac{A_t - A_l}{2}$ $A_b = \frac{V}{h}$ $h = \frac{V}{A_b}$
Cubo 	Come il parallelepipedo, oppure: $A_l = 4s^2$ $A_t = 6s^2$ $V = s^3$ $d = s\sqrt{3} \approx s \cdot 1{,}73$	$s = \sqrt{\frac{A_l}{4}}$ $s = \sqrt{\frac{A_t}{6}}$ $s = \sqrt[3]{V}$
Cilindro 	$A_l = 2\pi rh$ $A_t = A_l + 2A_b$ $V = \pi r^2 h$	$r = \frac{A}{2\pi h}$ $h = \frac{A}{2\pi r}$ $A_l = A_t - 2A_b$ $A_b = \frac{A_t - A_l}{2}$ $h = \frac{V}{\pi r^2}$ $r = \sqrt{\frac{V}{\pi h}}$
Sfera 	$A = 4\pi r^2$ $V = \frac{4}{3}\pi r^3$	$r = \sqrt{\frac{A}{4\pi}}$ $r = \sqrt[3]{\frac{3V}{4\pi}}$
Piramide retta 	$A_l = \frac{p_b a}{2}$ $A_t = A_l + A_b$ $V = \frac{A_b h}{3}$	$p_b = \frac{2A_l}{a}$ $a = \frac{2A_l}{p_b}$ $A_b = \frac{3V}{h}$ $h = \frac{3V}{A_b}$

Solido	Formule dirette	Formule inverse
Cono  C: misura della circonferenza di base	$A_l = \frac{C \cdot a}{2} = \pi r a$ $A_l = \pi r a$ $A_t = A_l + A_b = \pi r a + \pi r^2$ $V = \frac{\pi r^2 h}{3}$	$a = \frac{A_l}{\pi r}$ $r = \frac{A_l}{\pi a}$ $r = \sqrt{\frac{3V}{\pi h}}$ $h = \frac{3V}{\pi r^2}$

Poliedri regolari	Area totale	Volume
Tetraedro	$4 \cdot l^2 \cdot 0{,}433$	$l^3 \cdot 0{,}117$
Esaedro o Cubo	$6 \cdot l^2$	$l^3 \cdot 1$
Ottaedro	$8 \cdot l^2 \cdot 0{,}433$	$l^3 \cdot 0{,}471$
Dodecaedro	$12 \cdot l^2 \cdot 1{,}720$	$l^3 \cdot 7{,}663$
Icosaedro	$20 \cdot l^2 \cdot 0{,}433$	$l^3 \cdot 2{,}182$