FORMULE DE CALCUL PRESCURTAT

$(a+b)^2=a^2+2ab+b^2$; $(a-b)^2=a^2-2ab+b^2$; $a^2-b^2=(a+b)(a-b)$; $(a+b+c)^2=a^2+b^2+c^2+2ab+2ac+2bc$

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

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

PROPRIETATILE PUTERILOR

$a^n \cdot a^m=a^{n+m}$; $a^n:a^m=a^{n-m}$; $(a^n)^m=a^{n\cdot m}$; $(a\cdot b)^n=a^n\cdot b^n$; $(a:b)^n=a^n:b^n$; $a^0=1$; $0^n=0$; $1^n=1$

PROPRIETATILE RADICALILOR

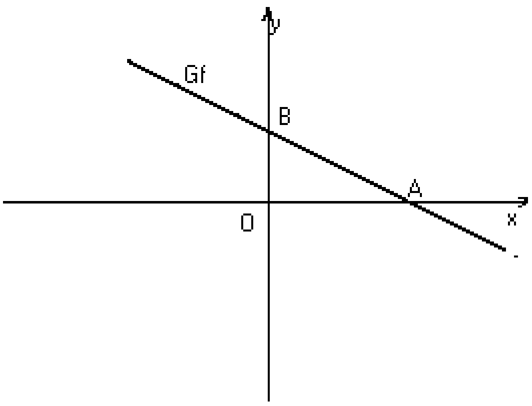
$\sqrt{a\cdot b}=\sqrt{a}\cdot\sqrt{b}$; $\sqrt{a/b}=\sqrt{a}/\sqrt{b}$; $\sqrt{x^2}=|x|$; $\left(\sqrt{y}\right)^2=y$; $a\geq 0$; $b\geq 0$; $y\geq 0$; exemple:

$\sqrt{18}=\sqrt{9\cdot 2}=\sqrt{9}\cdot\sqrt{2}=3\sqrt{2}$; $5\sqrt{3}=\sqrt{25}\cdot\sqrt{3}=\sqrt{25\cdot 3}=\sqrt{75}$; $\sqrt{(-3)^2}=|-3|=3$;
$\left(\sqrt{6}\right)^2=6$.

MODULUL

Definitie : $|X|=X$ daca $X\geq 0$ si $|X|=-X$ daca $X\leq 0$;
Proprietati : $|X|\geq 0$; $|a\cdot b|=|a|\cdot|b|$; $|a+b|\leq|a|+|b|$;
Exemple : $|-5|=-(-5)=5$; $|7|=7$; $|-2|=-(-2)=2$; $|+4|=4$;

FUNCTIA LINIARA f :R→R , f(x)=ax+b



$P(x,y)\in G_f$ daca si numai daca $f(x)=y$;

$A(x,y)\in G_f\cap ox$ daca $f(x)=y$ si $y=0$;
$B(x,y)\in G_f\cap oy$ daca $f(x)=y$ si $x=0$;

Daca f si g sunt doua functii atunci $Q(x,y)\in G_f\cap G_g$ daca $f(x)=g(x)=y$;

$A(-b/a\ ,\ 0)$ si $B(0\ ,\ b)$

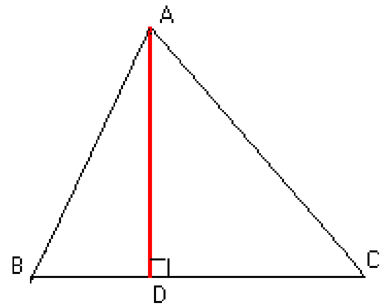
MULTIMI DE NUMERE

Multimea numerelor naturale notata cu **N** : 0,1,2,3,4,…∞
Multimea numerelor intregi notata cu **Z** : -∞ … ,-4,-3,-2,-1,0,1,2,3,4,…+∞
Multimea numerelor rationale notata cu **Q**: exemple -3/4 ;5/2 ;-12/4 ;0,23 ;-5,(24) ;4,20(576) ;
Multimea numerelor reale notata cu **R** ; exemple : -3/4 ;5/2 ;-1/4 ; $7\sqrt{5}$; $-\sqrt{6}$; -5,(24) ; 4,20(576) ; 0,202002000200… ;-5,2323323332333323… ;

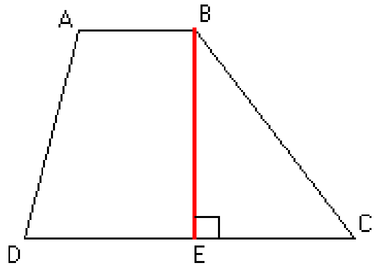
Orice numar natural este numar intreg : $\mathbf{N}\subset\mathbf{Z}$.

Orice numar intreg este numar rational : $\mathbf{Z} \subset \mathbf{Q}$.
Orice numar rational este numar real : $\mathbf{Q} \subset \mathbf{R}$.
Avem urmatoarele relatii de incluziune intre aceste multimi : $\mathbf{N} \subset \mathbf{Z} \subset \mathbf{Q} \subset \mathbf{R}$.
Numerele reale care nu sunt numere rationale se numesc numere irationale.

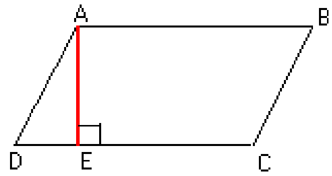
FIGURI PLANE REMARCABILE



TRIUNGHIUL OARECARE



TRAPEZUL



PARALELOGRAMUL

$A_{\Delta ABC} = \frac{BC \cdot AD}{2} = \frac{AB \cdot AC \cdot \sin A}{2}$

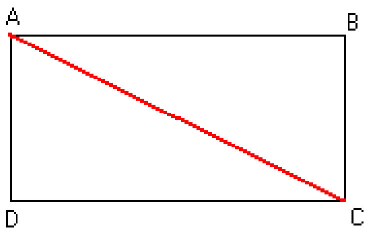
$P_{\Delta ABC} = AB + BC + CA$

$A_{ABCD} = \frac{(AB + CD) \cdot BE}{2}$

$P_{ABCD} = AB + BC + CD + DA$

$A_{ABCD} = CD \cdot AE$

$P_{ABCD} = 2 \cdot (AB + BC)$

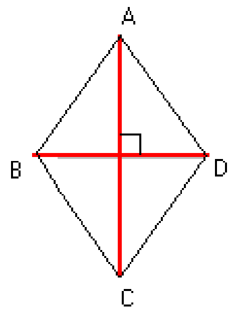


DREPTUNGHIUL

$A_{ABCD} = AB \cdot BC$

$AC^2 = AB^2 + BC^2$

$P_{ABCD} = 2 \cdot (AB + BC)$

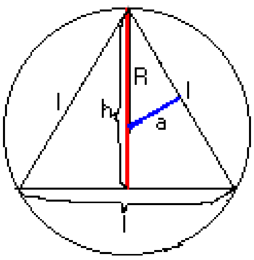


ROMBUL

$A_{ABCD} = \frac{AC \cdot BD}{2}$

$P_{ABCD} = 4 \cdot AB$

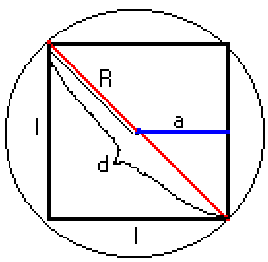
poligoane regulate : l=latura poligonului ; a=apotema poligonului ; A=aria ; P=perimetrul ;



triunghiul echilateral

$P = 3 \cdot l$

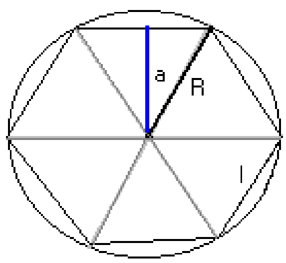
$A = \frac{l^2\sqrt{3}}{4}$; $a = \frac{l\sqrt{3}}{6}$



patratul

$P = 4 \cdot l$

$A = l^2$; $a = \frac{l}{2}$



hexagonul regulat

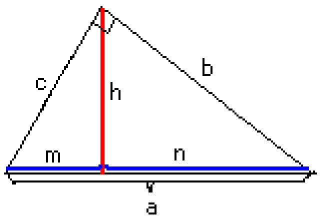
$P = 6 \cdot l$

$A = \frac{3l^2\sqrt{3}}{2}$; $a = \frac{l\sqrt{3}}{2}$

l=R$\sqrt{3}$ | l=R$\sqrt{2}$ | l=R

$h=\frac{l\sqrt{3}}{2}=\frac{3R}{2}$ | d=l$\sqrt{2}$ =2R

TRIUNGHIUL DREPTUNGHIC



triunghiul dreptunghic

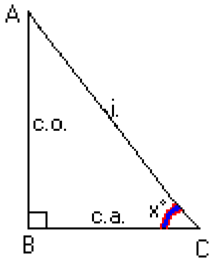
Teorema catetei: $b^2=a\cdot n$; $c^2=a\cdot m$

Teorema inaltimii: $h^2=m\cdot n$; $h=\frac{b\cdot c}{a}$

Teorema lui Pitagora: $a^2=b^2+c^2$; $c^2=h^2+m^2$ si $b^2=h^2+n^2$

Aria tr. dreptunghic: $A=\frac{b\cdot c}{2}=\frac{a\cdot h}{2}$

FUNCTII TRIGONOMETRICE



tr. dreptunghic

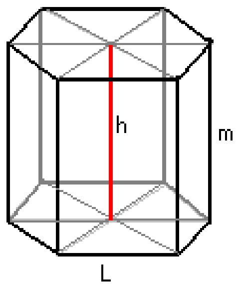
functia	30°	60°	45°	functia	30°	60°	45°
sin	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	tg	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$	1
cos	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	ctg	$\sqrt{3}$	$\frac{\sqrt{3}}{3}$	1

$\sin x°=\frac{c.o.}{i.}=\frac{AB}{AC}$ $\cos x°=\frac{c.a.}{i.}=\frac{BC}{AC}$ $tg\ x°=\frac{c.o.}{c.a.}=\frac{AB}{BC}$ $ctg\ x°=\frac{c.a.}{c.o.}=\frac{BC}{AB}$

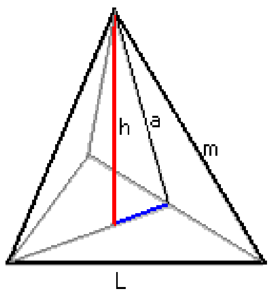
NOTATII UTILIZATE IN GEOMETRIA CORPURILOR REGULATE

A_l –aria laterala ; A_t –aria totala ; V- volumul ; a_p-apotema piramidei ; a_{tr}-apotema trunchiului A_b-aria bazei mici ; A_B-aria bazei mari ; P_b-perimetrul bazei mici ; P_B-perimetrul bazei mari ; h-inaltimea corpului ; m-muchia laterala ; a_b-apotema bazei mici ; a_B-apotema bazei mari ; l-latura bazei mici ; L-latura bazei mari ; g-generatoarea (la cilindru ,con ,trunchi de con) ; r-raza bazei mici ; R-raza bazei mari .

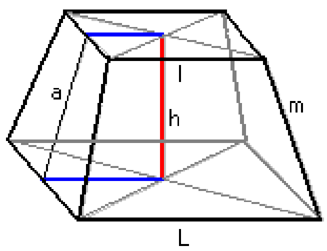
PRISMA , PIRAMIDA , TRUNCHIUL DE PIRAMIDA



PRISMA



PIRAMIDA



TRUNCHIUL DE PIRAMIDA

$A_l = P_B \cdot m$

$A_t = A_l + 2 \cdot A_B$

$V = A_B \cdot h$

$A_l = \frac{P_B \cdot a_p}{2}$

$A_t = A_l + A_B$

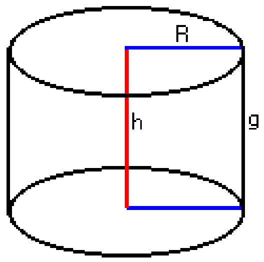
$V = \frac{A_B \cdot h}{3}$

$A_l = \frac{(P_b + P_B) \cdot a_{tr}}{2}$

$A_t = A_l + A_b + A_B$

$V = \frac{h \cdot \left(A_b + A_B + \sqrt{A_b \cdot A_B}\right)}{3}$

CILINDRUL ,CONUL ,TRUNCHIUL DE CON

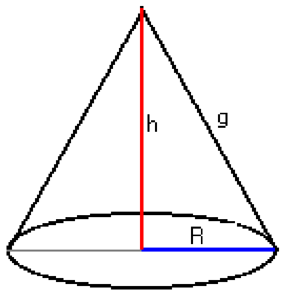


CILINDRUL

$A = 2\pi Rg$

$A_t = 2\pi R(g + R)$

$V = \pi R^2 h$

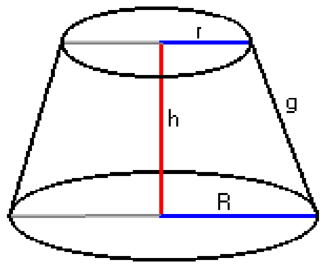


CONUL

$A_l = \pi Rg$

$A_t = \pi R(g + R)$

$V = \frac{\pi R^2 h}{3}$



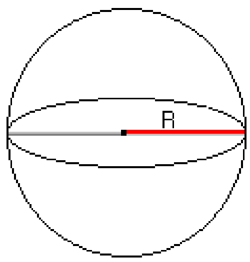
TRUNCHIUL DE CON

$A_l = \pi g(R + r)$

$A_t = \pi g(R + r) + \pi R^2 + \pi r^2$

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

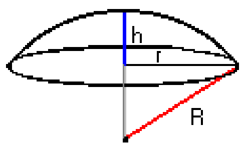
SFERA ,CALOTA SFERICA ,PARALELIPIPEDUL DREPTUNGHIC



SFERA

$A_s = 4\pi R^2$

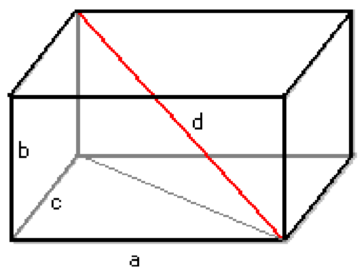
$V_s = \frac{4\pi R^3}{3}$



CALOTA SFERICA

$A_c = 2\pi Rh$

$R^2 = r^2 + (R-h)^2$



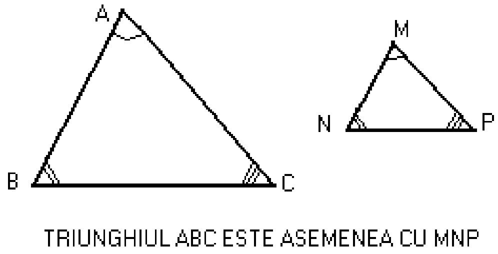
PARALELIPIPEDUL DREPTUNGHIC

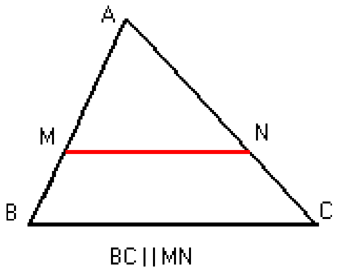
$A_t = 2 \cdot (ab + ac + bc)$

$V = a \cdot b \cdot c$

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

TRIUNGHIURI ASEMENEA ,TEOREMA LUI THALES

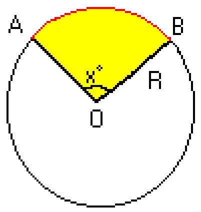




rezulta: $\frac{AB}{MN} = \frac{AC}{MP} = \frac{BC}{NP}$

rezulta: $\frac{AB}{AM} = \frac{AC}{AN}$

CERCUL



$L_c = 2\pi R$;

$A_c = \pi R^2$;

Daca $m\angle AOB = x^o$ atunci :

$L_{AB} = \frac{\pi R x^o}{180^o}$

$A_{OAB} = \frac{\pi R^2 x^o}{360^o}$