matematica.fun

Formule

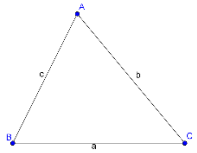
R.TITEL

Triunghiul oarecare

$$A=\frac{b\cdot h}{2}$$

$$A=\frac{a\cdot b\cdot sin\sphericalangle C}{2}$$

$$A=\sqrt{p(p-a)(p-b)(p-c)}$$



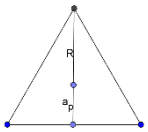
Triunghiul echilateral

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

$$h=\frac{l\sqrt{3}}{2}$$

$$a_p=\frac{l\sqrt{3}}{6}$$

$$R=2a_p=\frac{l\sqrt{3}}{3}$$

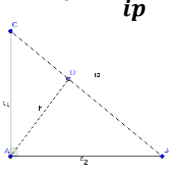


Triunghiul dreptunghic

$$A=\frac{c_1\cdot c_2}{2}$$

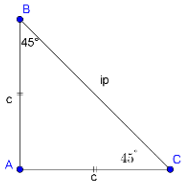
$$A=\frac{ip\cdot h}{2}$$

$$h=\frac{c_1\cdot c_2}{ip}$$



Triunghiul dreptunghic isoscel

$$A=\frac{c^2}{2}=\frac{ip^2}{4}=h^2$$



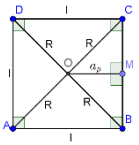
Pătratul

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

$$d=l\sqrt{2}$$

$$a_p=\frac{l}{2}$$

$$R=\frac{d}{2}$$

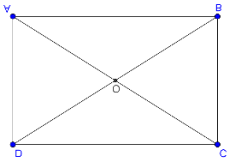


Dreptunghiul

$$A=L\cdot l$$

$$A=\frac{d^2\cdot sin\sphericalangle dd}{2}$$

$$d=\sqrt{L^2+l^2}$$

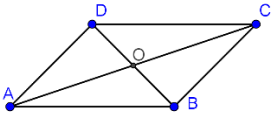


Paralelogramul

$$A=b\cdot h$$

$$A=L\cdot l\cdot sin\sphericalangle Ll$$

$$A=\frac{d_1\cdot d_2\cdot sin\sphericalangle d_1d_2}{2}$$

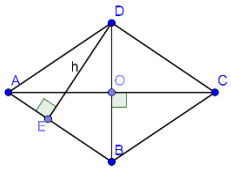


Rombul

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

$$A=b\cdot h$$

$$A=l^2\cdot sin\sphericalangle ll$$



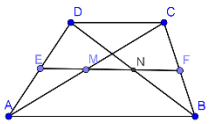
Trapezul

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

$$A=l_{mij}\cdot h$$

$$l_{mij}=\frac{B+b}{2}$$

$$Seg\ det\ de\ mij\ diag=\frac{B-b}{2}$$



Hexagonul regulat

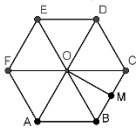
$$A=6\cdot\frac{l^2\sqrt{3}}{4}$$

$$a_p=\frac{l\sqrt{3}}{2}$$

$$R=l$$

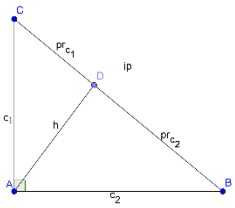
$$D=2R=2l$$

$$d=l\sqrt{3}$$



Teoreme în triunghiul dreptunghic

1. T înălțimii: $h^2=pr_{c_1}\cdot pr_{c_2}$
2. T catetei : $c^2=ip\cdot pr_c$
3. T Pitagora : $ip^2={c_1}^2+{c_2}^2$
4. T $\sphericalangle 30°$: Cateta opusă unghiului de 30° este jumătate din ipotenuză
5. T medianei: Mediana dusă pe ipotenuză este jumătate din ipotenuză.
6. $h=\frac{c_1\cdot c_2}{ip}$



Cubul

$$A_f=l^2$$

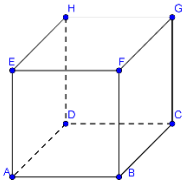
$$A_l=4l^2$$

$$A_t=6l^2$$

$$V=l^3$$

$$d_c=l\sqrt{3}$$

$$d_f=l\sqrt{2}$$



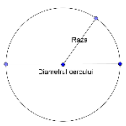
Cercul

$$D=2R$$

$$L=2\pi R$$

$$L=\pi D$$

$$A=\pi R^2$$



Paralelipipedul dreptunghic

$$A_b=L\cdot l$$

$$A_l=P_b\cdot h$$

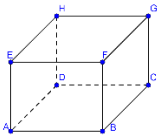
$$A_t=A_l+2\cdot A_b$$

$$A_t=2Ll+2Lh+2lh$$

$$V=A_b\cdot h=L\cdot l\cdot h$$

$$d=\sqrt{L^2+l^2+h^2}$$

$$d_{față}=\sqrt{L^2+l^2}$$



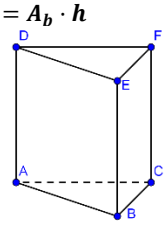
Prisma triunghiulară regulată

$$A_b=\frac{l^2\sqrt{3}}{4}$$

$$A_l=P_b\cdot h$$

$$A_t=A_l+2\cdot A_b$$

$$V=A_b\cdot h$$



Prisma patrulateră regulată

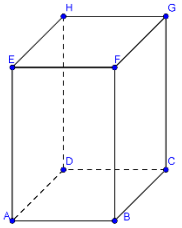
$$A_b=l^2$$

$$A_l=P_b\cdot h$$

$$A_t=A_l+2\cdot A_b$$

$$V=A_b\cdot h$$

$$d=\sqrt{l^2+l^2+h^2}$$



Numere pitagoreice

3,4,5

3k,4k,5k

În triunghiul dr. is. x, x, $x\sqrt{2}$

În triunghiul 30-60-90 x, 2x, $x\sqrt{3}$

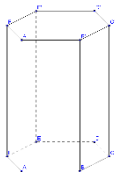
Prisma hexagonală regulată

$$A_b=6\cdot\frac{l^2\sqrt{3}}{4}$$

$$A_l=P_b\cdot h$$

$$A_t=A_l+2\cdot A_b$$

$$V=A_b\cdot h$$



Tetraedrul regulat

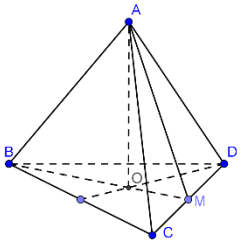
$$A_f=\frac{l^2\sqrt{3}}{4}$$

$$A_l=3\cdot\frac{l^2\sqrt{3}}{4}$$

$$A_t=4\cdot\frac{l^2\sqrt{3}}{4}=l^2\sqrt{3}$$

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

$$h_{tetraedru}=\frac{l\sqrt{6}}{3}$$



Piramidă triunghiulară regulată

$$OM=a_p=\frac{l\sqrt{3}}{6}$$

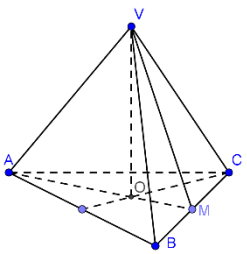
$$OA=R=2\cdot OM$$

$$A_b=\frac{l^2\sqrt{3}}{4}$$

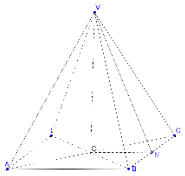
$$A_l=\frac{P_b\cdot a_p}{2}$$

$$A_t=A_l+A_b$$

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



Piramidă patrulateră regulată



$$OM=a_p=\frac{l}{2}$$

$$AC=BD=d=l\sqrt{2}$$

$$OA=OB=OC=OD=\frac{d}{2}$$

$$A_b=l^2$$

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

$$A_t=A_l+A_b$$

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

Piramidă hexagonală regulată

$$OM=\frac{l\sqrt{3}}{2}$$

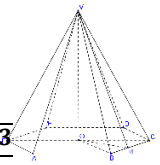
$$R=l$$

$$A_b=6\cdot\frac{l^2\sqrt{3}}{4}$$

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

$$A_t=A_l+A_b$$

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



matematica.fun

Formule

R.TITEL

Trunchiul de piramidă

$A_b = \cdots \ldots \ldots \ldots \ldots \ldots$

$A_l = \dfrac{(P_b + P_b) \cdot a_{p\,tr}}{2}$

$A_t = A_l + A_b + A_B$

$V = \dfrac{h}{3}(A_B + A_b + \sqrt{A_B \cdot A_b})$

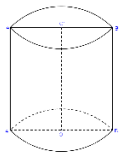
Cilindrul

$A_b = \pi R^2$

$A_l = 2\pi RG$

$A_t = A_l + 2 \cdot A_b$

$V = A_b \cdot h$



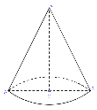
Conul

$A_b = \pi R^2$

$A_l = \pi RG$

$A_t = A_l + A_b$

$V = \dfrac{A_b \cdot h}{3}$



Trunchiul de con

$A_b = \pi R^2$

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

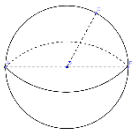
$A_t = A_l + A_b + A_B$

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

Sfera

$A = 4\pi R^2$

$V = \dfrac{4\pi R^3}{3}$



$sin\sphericalangle = \dfrac{cat.op.}{ip}$

$cos\sphericalangle = \dfrac{cat.al.}{ip}$

$tg\sphericalangle = \dfrac{cat.op.}{cat.al.}$

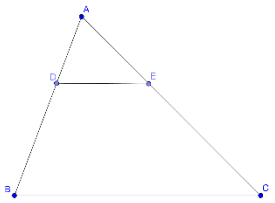
$ctg\sphericalangle = \dfrac{cat.al.}{cat.op.}$

$sin\sphericalangle^2 + cos\sphericalangle^2 = 1$

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

Teorema lui Thales

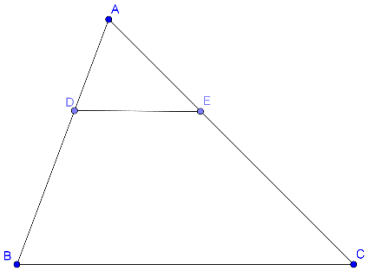
Dacă DE ∥ BC $\Rightarrow \frac{AD}{DB} = \frac{AE}{EC}$



T.F.A.

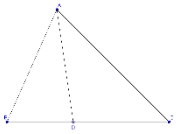
Dacă DE∥BC $\Rightarrow \Delta ADE \sim \Delta ABC$

$\Rightarrow \frac{AD}{AB} = \frac{AE}{AC} = \frac{DE}{BC}$



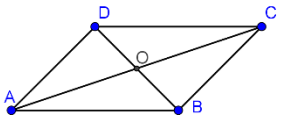
Teorema bisectoarei

AD bisectoare$\Rightarrow \frac{BD}{DC} = \frac{AB}{AC}$



Mediana împarte un triunghi în două triunghiuri echivalente (de arii egale).

Diagonalele împart un paralelogram în patru triunghiuri echivalente.



Într-un triunghi dreptunghic înălțimea opusă unghiului de 15° este un sfert din ipotenuză.

Funcții

$A(x, y) \in G_f \Leftrightarrow f(x) = y$

$G_f \cap Ox$ *Rezolvăm ecuația* $f(x) = 0$

$\Rightarrow A(\ldots, 0)$

$G_f \cap Oy$ *Calculăm* $f(0) = \cdots \Rightarrow B(0, \ldots)$

$G_f \cap G_g$ *Rezolvăm ecuația* $f(x) = g(x)$

Un trapez isoscel cu diagonalele perpendiculare are înălțimea egală cu linia mijlocie $h = \frac{B+b}{2}$, adică media aritmetică a bazelor.

Un trapez dreptunghic cu diagonalele perpendiculare are înălțimea egală cu media geometrică a bazelor. $h = \sqrt{B \cdot b}$

Formule de calcul

$(a + b)^2 = a^2 + 2 \cdot a \cdot b + b^2$

$(a - b)^2 = a^2 - 2 \cdot a \cdot b + b^2$

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

$(x - 5)^2 = x^2 - 2 \cdot x \cdot 5 + 5^2 = x^2 - 10x + 25$

$(x + 7)^2 = x^2 + 2 \cdot x \cdot 7 + 7^2 = x^2 + 14x + 49$

$(x - 4)(x + 4) = x^2 - 4^2 = x^2 - 16$

$(x - 3)(x + 5) = x^2 + 5x - 3x - 15$

$(3x - 2)^2 = (3x)^2 - 2 \cdot 3x \cdot 2 + 2^2 = 9x^2 - 12x + 4$

$(5x - 2)^2 = (5x)^2 - 2 \cdot 5x \cdot 2 + 2^2$

$= 25x^2 - 20x + 4$

$(3x - 5)(3x + 5) = (3x)^2 - 5^2 = 9x^2 - 25$

$(2x - 3)(3x - 7) = 6x^2 - 14x - 9x + 21$

Descompuneri

Factor comun

$3x + 6 = 3(x + 2)$

$10x - 15 = 5(2x - 3)$

$x^2 - 4x = x(x - 4)$

$5x(x - 6) - 2(x - 6) = (x - 6)(5x - 2)$

$x^3 + x^2 - 4x - 4 = x^2(x + 1) - 4(x + 1) = (x + 1)(x^2 - 4)$

$= (x + 1)(x + 2)(x - 2)$

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

$x^2 - 25 = (x - 5)(x + 5)$

$9x^2 - 49 = (3x - 7)(3x + 7)$

$(x + 3)^2 - 49 = (x + 3 - 7)(x + 3 + 7) = (x - 4)(x + 10)$

$(2x - 5)^2 - (x + 4)^2 = (2x - 5 - x - 4)(2x - 5 + x + 4) = (x - 9)(3x - 1)$

$a^2 + 2 \cdot a \cdot b + b^2 = (a + b)^2$

$9x^2 - 12x + 4 = (3x - 2)^2$

$x^2 - 12x + 36 = (x - 6)^2$

Spargere

$x^2 - 4x + 3 = (x - 1)(x - 3)$

$\therefore$

-1 -3