MATEMATIKAI KÉPLETTÁR

Hatványok

$$a^n - b^n = (a-b)(a^{n-1} + a^{n-2}b + a^{n-3}b^2 + ... + ab^{n-2} + b^{n-1})$$

$$a^{2k+1} + b^{2k+1} = (a+b)(a^{2k} - a^{2k-1}b + a^{2k-2}b^2 - ... - ab^{2k-1} + b^{2k})$$

$$a^{2k} - b^{2k} = (a+b)(a^{2k-1} - a^{2k-2}b + a^{2k-3}b^2 - ... + ab^{2k-2} - b^{2k-1})$$

Binomiális együtthatók

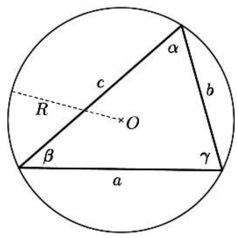
$$\binom{n}{k} = \binom{n}{n-k}$$

$$\binom{n}{k} + \binom{n}{k+1} = \binom{n+1}{k+1}$$

Háromszögek

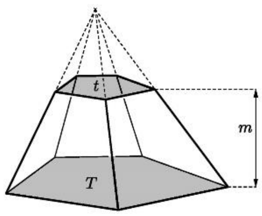
$K = 2s$

$$T = \frac{abc}{4R} = \sqrt{s(s-a)(s-b)(s-c)} = \frac{a^2 \sin\beta \sin\gamma}{2\sin\alpha}$$



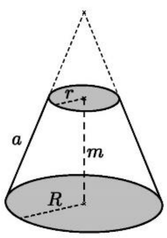
Felszín és térfogat

Csonkagúla: $V = \frac{m}{3}\left(T + \sqrt{Tt} + t\right)$



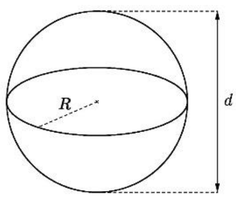
Csonkakúp: $A = \pi\left[R^2 + r^2 + (R+r)a\right]$

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



Gömb: $A = 4R^2\pi = d^2\pi$

$V = \frac{4R^3\pi}{3} = \frac{d^3\pi}{6}$



Trigonometriai összefüggések

$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\alpha\sin\beta$

$\cos(\alpha \pm \beta) = \cos\alpha\cos\beta \mp \sin\alpha\sin\beta$

$\mathrm{tg}(\alpha \pm \beta) = \dfrac{\mathrm{tg}\,\alpha \pm \mathrm{tg}\,\beta}{1 \mp \mathrm{tg}\,\alpha\,\mathrm{tg}\,\beta}$

Differenciálszámítás

$(c \cdot f)' = c \cdot f'$

$(f \pm g)' = f' \pm g'$

$(f \cdot g)' = f' \cdot g + f \cdot g'$

$\left(\dfrac{f}{g}\right)' = \dfrac{f' \cdot g - f \cdot g'}{g^2}$

$(f(g))' = f'(g) \cdot g'$

$(\sin x)' = \cos x$

$(\cos x)' = -\sin x$

$(\mathrm{tg}\, x)' = \dfrac{1}{\cos^2 x}$

$(\mathrm{ctg}\, x)' = -\dfrac{1}{\sin^2 x}$

Integrálszámítás

$\int (c \cdot f) = c \cdot \int f$

$\int (f \pm g) = \int f \pm \int g$

$\int \sin x \, dx = -\cos x + C$

$\int \cos x \, dx = \sin x + C$

$\int_a^b f = -\int_b^a f$

$\int_a^b f = \int_a^c f + \int_c^b f$

$\int_a^b (c \cdot f) = c \cdot \int_a^b f$

$\int_a^b (f \pm g) = \int_a^b f \pm \int_a^b g$

Valószínűségszámítás

$P(A) + P(\overline{A}) = 1$

$P(A + B) = P(A) + P(B) - P(A \cdot B)$

$P(A|B) = \dfrac{P(A \cdot B)}{P(B)}$