Formúlublað

Rétthyrndur þríhyrningur

$$\cos v = \frac{\text{A}\delta l}{\text{Lang}}$$
 $\sin v = \frac{\text{M}\delta tl}{\text{Lang}}$ $\tan v = \frac{\text{M}\delta tl}{\text{A}\delta l}$

Jafna beinnar línu

$$y = hx + k \qquad \qquad y - y_1 = h(x - x_1)$$

Fjarlægðarformúla

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Hallatala línu

$$h = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

Miðpunktur striks

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Lausnaformúla

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Samhverfuás

$$x = \frac{-b}{2a}$$

Lograr

$$\lg(AB) = \lg A + \lg B \qquad \qquad \lg\left(\frac{A}{B}\right) = \lg A - \lg B$$

$$\lg A^y = y \lg A$$

Umraðanir og samantektir

$$P(n,k) = \frac{n!}{(n-k)!}$$

$$C(n,k) = \binom{n}{k} = \frac{P(n,k)}{k!} = \frac{n!}{(n-k)!k!}$$

Hornaföll

$$\sin(u \pm v) = \sin u \cdot \cos v \pm \cos u \cdot \sin v$$

$$\cos(u \pm v) = \cos u \cdot \cos v \mp \sin u \cdot \sin v$$

$$\sin 2u = 2\sin u \cdot \cos u$$

$$\cos 2u = \cos^2 u - \sin^2 u$$

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

$$\tan u = \frac{\sin u}{\cos u}$$

Vigrar

$$\vec{u} \cdot \vec{v} = |\vec{u}| \cdot |\vec{v}| \cdot \cos(\vec{u}, \vec{v})$$

Afleiður

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} = \lim_{x \to x_0} \frac{f(x) - f(x_0)}{x - x_0}$$
$$(f \cdot g)' = f' \cdot g + f \cdot g'$$
$$\left(\frac{f}{g}\right)' = \frac{f' \cdot g - f \cdot g'}{g^2}$$

Keðjuregla

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

Töluleg heildun

$$T = \frac{f(x_1) + f(x_2)}{2} \cdot h$$
$$M = f(m) \cdot h$$
$$S = \frac{T + 2M}{3}$$

Runur og raðir

$$a_n = a_1 + (n-1)d$$

$$a_n = a_1 \cdot k^{n-1}$$

$$s = \frac{a_1}{1-k}$$

$$s_n = \frac{n(a_1 + a_n)}{2}$$

$$s_n = \frac{a_1(k^n - 1)}{k-1}$$

Hlutheildun

$$\int f(x)g'(x) dx = f(x)g(x) - \int f'(x)g(x) dx$$

Rúmmál

$$V_{x} = \pi \int_{a}^{b} (f(x))^{2} dx$$

$$V_{x} = \pi \int_{a}^{b} ((f(x))^{2} - (g(x))^{2}) dx$$

$$V_{y=k} = \pi \int_{a}^{b} (f(x) - k)^{2} dx$$

$$V_{y} = 2\pi \int_{a}^{b} x |f(x)| dx$$

$$V_{y} = 2\pi \int_{a}^{b} x |f(x) - g(x)| dx$$

$$V_{x=k} = 2\pi \int_{a}^{b} (x - k)|f(x) - g(x)| dx \qquad \text{ef } k \le a < b$$

Bogalengd

$$s = \int_{a}^{b} \sqrt{1 + (f'(x))^2} \, dx$$

Yfirborðsflatarmál

$$Y_x = 2\pi \int_a^b |f(x)| \sqrt{1 + (f'(x))^2} \, dx$$
$$Y_y = 2\pi \int_a^b |x| \sqrt{1 + (f'(x))^2} \, dx$$

Tvinntölur

$$P(z) = (z^2 - 2\text{Re}(w) \cdot z + |w|^2) \cdot Q(z)$$
$$e^{ix} = \cos x + i \sin x$$

Deildajöfnur

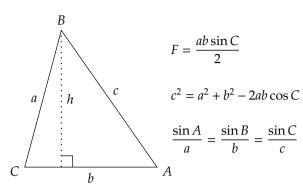
$$y = k_1 e^{\alpha_1 x} + k_2 e^{\alpha_2 x}$$

$$y = e^{px} (k_1 \cos(qx) + k_2 \sin(qx))$$

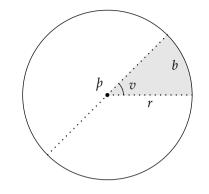
$$y = e^{\alpha x} (k_1 x + k_2)$$

Formúlublað

Þríhyrningur



Hringur



 $U=2\pi r=p\pi$

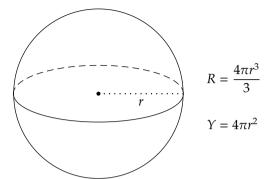
 $b = \frac{v}{360^{\circ}} \cdot U$

 $F_g = \frac{v}{360^{\circ}} \cdot F$

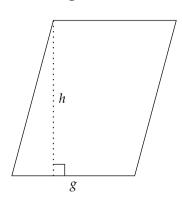
R = abh

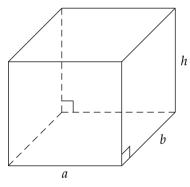
 $F=\pi r^2$

Kúla

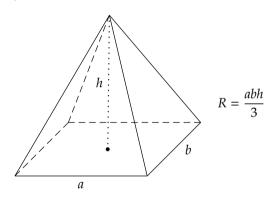


Samsíðungur

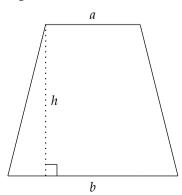




Pýramídi



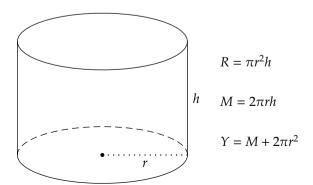
Trapisa



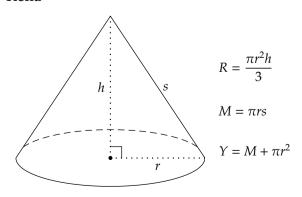
$$F = \frac{(a+b)h}{2}$$

F = gh

Sívalningur



Keila



Formúlublað

Deildunarreglur (Diffrun)

innarregion (Diffron)
$$\frac{d}{dx} k = 0 \quad (k \text{ er fasti})$$

$$\frac{d}{dx} kf(x) = k \left(\frac{d}{dx} f(x)\right) \quad (k \text{ er fasti})$$

$$\frac{d}{dx} (f(x) \pm g(x)) = f'(x) \pm g'(x)$$

$$\frac{d}{dx} x = 1$$

$$\frac{d}{dx} \sqrt{x} = \frac{1}{2\sqrt{x}}$$

$$\frac{d}{dx} x^n = nx^{n-1}$$

$$\frac{d}{dx} a^x = \ln a \cdot a^x$$

$$\frac{d}{dx} |x| = \frac{x}{|x|}$$

$$\frac{d}{dx} e^{ax} = ae^{ax}$$

$$\frac{d}{dx} \sin x = \cos x$$

$$\frac{d}{dx} \sin x = a \cos ax$$

$$\frac{d}{dx} \cos x = -\sin x$$

$$\frac{d}{dx} \cos x = -a \sin ax$$

$$\frac{d}{dx} \tan x = \frac{1}{\cos^2 x} = 1 + \tan^2 x$$

$$\frac{d}{dx} \tan ax = \frac{a}{\cos^2 ax} = a(1 + \tan^2 ax)$$

$$\frac{d}{dx} \ln|x| = \frac{1}{x}$$

$$\frac{d}{dx} \ln|ax + b| = \frac{a}{ax + b}$$

$$\frac{d}{dx} \sin^{-1} x = \frac{1}{\sqrt{1 - x^2}}$$

$$\frac{d}{dx} \cos^{-1} x = -\frac{1}{\sqrt{1 - x^2}}$$

$$\frac{d}{dx} \tan^{-1} x = \frac{1}{1 + x^2}$$

Keðjuregla

$$\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x)$$

Samsett föll

$$\frac{d}{dx}\left(f(x)\cdot g(x)\right) = f'(x)\cdot g(x) + f(x)\cdot g'(x)$$

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x)\cdot g(x) - f(x)\cdot g'(x)}{(g(x))^2}$$

Hlutheildun

$$\int f(u)g'(u)\ du = f(u)g(u) - \int f'(u)g(u)\ du$$

Meðalgildi

$$m(f) = \frac{1}{b-a} \int_{a}^{b} f(u) \, du$$

Heildunarreglur (Tegrun)

$$\int du = u + C$$

$$\int k \, du = ku + C \quad (k \text{ er fasti})$$

$$\int (du \pm dv) = \int du \pm \int dv$$

$$\int u^n \, du = \frac{u^{n+1}}{n+1} + C \quad (n \neq -1)$$

$$\int \frac{du}{u} = \ln|u| + C$$

$$\int a^{u} du = \frac{a^{u}}{\ln a} + C \quad a > 0, a \neq 1$$

$$\int e^{u} du = e^{u} + C$$

$$\int e^{bu} du = \frac{e^{bu}}{b} + C \quad (b \neq 0)$$

$$\int \sin u du = -\cos u + C$$

$$\int \sin bu du = -\frac{\cos bu}{b} + C \quad (b \neq 0)$$

$$\int \cos u du = \sin u + C$$

$$\int \cos bu du = \frac{\sin bu}{b} + C \quad (b \neq 0)$$

$$\int \frac{1}{u+b} du = \ln|u+b| + C$$

$$\int \frac{1}{au+b} du = \frac{1}{a} \ln|au+b| + C$$

$$\int \frac{1}{\sin^{2} u} du = \tan u + C$$

$$\int \frac{1}{\sin^{2} u} du = -\frac{1}{\tan u} + C$$

$$\int \frac{\tan u}{\cos u} du = \frac{1}{\cos u} + C$$

$$\int \tan u du = -\ln|\cos u| + C$$

$$\int \frac{1}{\tan u} du = \ln|\sin u| + C$$

$$\int \frac{du}{a^{2} + u^{2}} = \frac{1}{a} \tan^{-1} \left(\frac{u}{a}\right) + C$$

$$\int \frac{du}{a^{2} + u^{2}} = \frac{1}{2a} \ln\left|\frac{u+a}{u-a}\right| + C$$