Formúlublað

Hallatala línu

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

Jafna beinnar línu

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

Fjarlægðarformúla

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

Miðpunktur striks

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

Lausnaformúla 2. stigs jafna

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

Útgildispunktur

$$Ú = \left(\frac{-b}{2a},\ c - \frac{b^2}{4a}\right)$$

Rétthyrndur þríhyrningur

$$\cos v = \frac{\text{Aðl}}{\text{Lang}} \qquad \sin v = \frac{\text{Mótl}}{\text{Lang}} \qquad \tan v = \frac{\text{Mótl}}{\text{Aðl}}$$

$$\sec v = \frac{\text{Lang}}{\text{Aðl}} \qquad \csc v = \frac{\text{Lang}}{\text{Mótl}} \qquad \cot v = \frac{\text{Aðl}}{\text{Mótl}}$$

Flatarmálsregla

$$F = \frac{ab \sin C}{2}$$

Kósínusregla

$$c^2 = a^2 + b^2 - 2ab \cos C$$

Sínusregla

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Hornaföll

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

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

$$\sin^2 u = \frac{1 - \cos 2u}{2}$$
$$\cos^2 u = \frac{1 + \cos 2u}{2}$$

$$1 = \cos^2 u + \sin^2 u$$
$$\tan u = \frac{\sin u}{\cos u}$$

Lograr

$$\log(ab) = \log a + \log b \qquad \log\left(\frac{a}{b}\right) = \log a - \log b$$

$$\log a^n = n \log a$$

Vigrar

$$\vec{u} \cdot \vec{v} = |\vec{u}| \cdot |\vec{v}| \cdot \cos \alpha$$
$$|\vec{u} \times \vec{v}| = |\vec{u}| \cdot |\vec{v}| \cdot \sin \alpha$$

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

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

Runur og raðir

$$a_n = a_1 + (n-1)d \qquad s_n = \frac{n(a_1 + a_n)}{2}$$

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

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

Hlutheildun

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

Rúmmál snúðs

$$V_x = \pi \int_a^b \Big(f(x)\Big)^2\,dx \qquad V_y = 2\pi \int_a^b x\Big|f(x)\Big|\,dx$$

Lengd ferils

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

Yfirborðsflatarmál snúðs

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

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

Tvinntölur

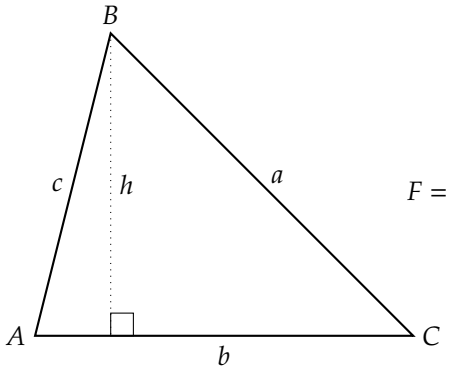
$$e^{ix} = \cos x + i \sin x$$

Deildajöfnur

$$y = C_1 e^{r_1 x} + C_2 e^{r_2 x}$$
$$y = e^{rx}(C_1 x + C_2)$$
$$y = e^{\alpha x}(C_1 \cos \beta x + C_2 \sin \beta x)$$

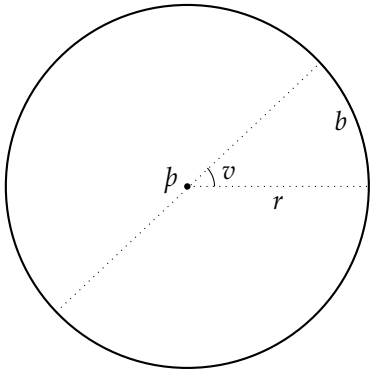
Formúlublað

Þríhyrningur



$$F = \frac{ab\sin C}{2}$$

Hringur



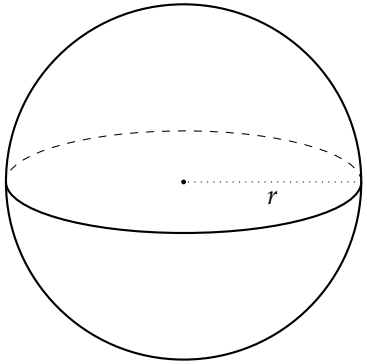
$$U = 2\pi r = þ\pi$$

$$F = \pi r^2$$

$$b = \frac{v}{360°} \cdot U$$

$$F_g = \frac{v}{360°} \cdot F$$

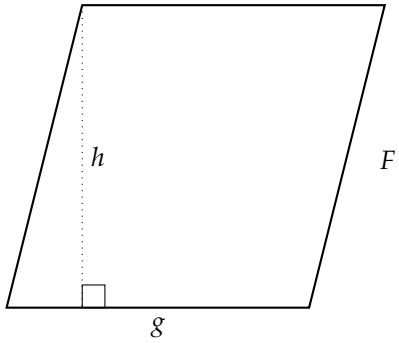
Kúla



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

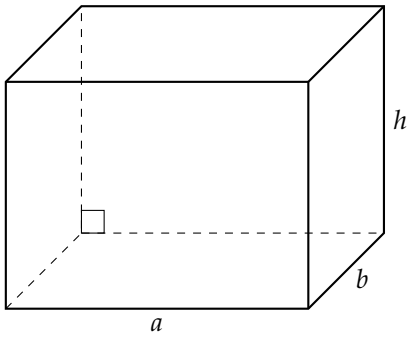
$$Y = 4\pi r^2$$

Samsíðungur



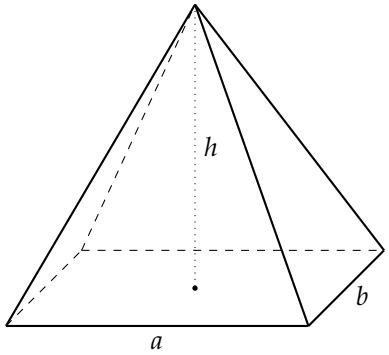
$$F = gh$$

Kassi



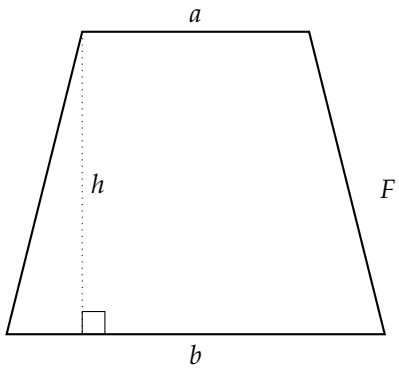
$$R = abh$$

Pýramídi



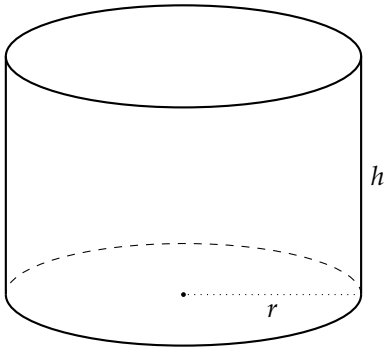
$$R = \frac{abh}{3}$$

Trapisa



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

Sívalningur

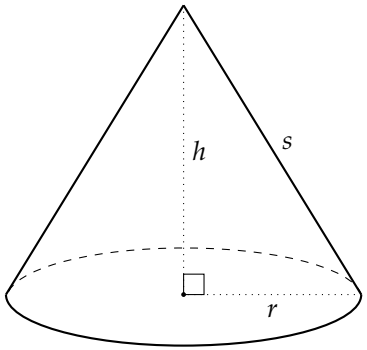


$$R = \pi r^2 h$$

$$M = 2\pi rh$$

$$Y = M + 2\pi r^2$$

Keila



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

$$M = \pi rs$$

$$Y = M + \pi r^2$$

Formúlublað

Deildunarreglur (Diffrun)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Keðjuregla

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

Samsett föll

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

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

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)

$$\int du = u + C$$

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

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

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

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

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

$$\int e^u\, du = e^u + C$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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