

Formelblad

Trigonometriska formler

$$\sin(x + y) = \sin x \cos y + \cos x \sin y \qquad \sin^2 x = \frac{1 - \cos 2x}{2}$$

$$\cos(x + y) = \cos x \cos y - \sin x \sin y \qquad \cos^2 x = \frac{1 + \cos 2x}{2}$$

$$\tan(x + y) = \frac{\tan x + \tan y}{1 - \tan x \tan y}$$

Några integraler (integrationskonstanter är utelämnade)

$$\int \frac{1}{x^2 + a} dx = \frac{1}{\sqrt{a}} \cdot \arctan \frac{x}{\sqrt{a}}, \quad a > 0. \qquad \int \frac{1}{x^2 - a} dx = \frac{1}{2\sqrt{a}} \cdot \ln \left| \frac{x - \sqrt{a}}{x + \sqrt{a}} \right|, \quad a > 0.$$

$$\int \frac{1}{\sqrt{a - x^2}} dx = \arcsin \frac{x}{\sqrt{a}}, \quad a > 0. \qquad \int \frac{1}{\sqrt{x^2 + a}} dx = \ln \left| x + \sqrt{x^2 + a} \right|, \quad a > 0.$$

$$\int \sqrt{x^2 + a} dx = \frac{1}{2} \cdot \left(x\sqrt{x^2 + a} + a \ln \left| x + \sqrt{x^2 + a} \right| \right)$$

Malaurinutvecklingar

$$e^x = 1 + x + \frac{x^2}{2} + \dots + \frac{x^n}{n!} + x^{n+1}B(x)$$

$$\ln(1 + x) = x - \frac{x^2}{2} + \dots + (-1)^{n-1} \frac{x^n}{n} + x^{n+1}B(x)$$

$$(1 + x)^\alpha = 1 + \alpha x + \frac{\alpha(\alpha - 1)}{2} \cdot x^2 + \dots + \frac{\alpha(\alpha - 1)\dots(\alpha - n + 1)}{n!} \cdot x^n + x^{n+1}B(x)$$

$$\sin x = x - \frac{x^3}{6} + \dots + (-1)^{n-1} \frac{x^{2n-1}}{(2n-1)!} + x^{2n+1}B(x)$$

$$\cos x = 1 - \frac{x^2}{2} + \dots + (-1)^n \frac{x^{2n}}{(2n)!} + x^{2n+2}B(x)$$

$$\arctan x = x - \frac{x^3}{3} + \dots + (-1)^{n-1} \frac{x^{2n-1}}{2n-1} + x^{2n+1}B(x)$$

Stirlings formel

$$n! = \left(\frac{n}{e}\right)^n \cdot \sqrt{2\pi n} \cdot (1 + \epsilon_n), \quad \text{där } \epsilon_n \rightarrow 0 \quad \text{då } n \rightarrow \infty.$$