FORMULARIO GENERAL DE CÁLCULO

Derivadas:

$$\frac{d}{dx}c = 0$$

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

$$\frac{d}{dx}cu = c\frac{du}{dx}$$

$$\frac{d}{dx}(u+v+...) = \frac{du}{dx} + \frac{dv}{dx} + ...$$

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

$$\frac{d}{dx}u^n = nu^{n-1}\frac{du}{dx}$$

$$\frac{d}{dx}uv = u\frac{dv}{dx} + v\frac{du}{dx}$$

$$\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

$$\frac{d}{dx}\sqrt{u} = \frac{\frac{du}{dx}}{2\sqrt{u}}$$

$$\frac{d}{dx}a^u = a^u \ln a\frac{du}{dx}$$

$$\frac{d}{dx}senu = cosu\frac{du}{dx}$$

$$\frac{d}{dx}cosu = -senu\frac{du}{dx}$$

$$\frac{d}{dx}tanu = sec^2 u\frac{du}{dx}$$

$$\frac{d}{dx}cotu = -csc^2 u\frac{du}{dx}$$

$$\frac{d}{dx}secu = tanusecu\frac{du}{dx}$$

$$\frac{d}{dx}cscu = -cotucscu\frac{du}{dx}$$

$$\frac{d}{dx}\ln u = \frac{\frac{du}{dx}}{u}$$

$$\frac{d}{dx}e^u = e^u\frac{du}{dx}$$

$$\frac{d}{dx} arc\,sen u = \frac{\frac{du}{dx}}{\sqrt{1-u^2}} \qquad \frac{d}{dx} arccos u = -\frac{\frac{du}{dx}}{\sqrt{1-u^2}}$$

$$\frac{d}{dx} arctan u = \frac{\frac{du}{dx}}{1+u^2} \qquad \frac{d}{dx} arccot u = -\frac{\frac{du}{dx}}{1+u^2}$$

$$\frac{d}{dx} arc\,sec u = \frac{\frac{du}{dx}}{u\sqrt{u^2-1}} \qquad \frac{d}{dx} arccsc u = -\frac{\frac{du}{dx}}{u\sqrt{u^2-1}}$$

Integrales:

$$\int dx = x + c \qquad \int cu dx = c\int u dx$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + c \qquad \text{para } n \neq -1$$

$$\int \frac{dx}{x} = ln\, x + c \qquad \int (u + v + ...)\, dx = \int u\, dx + \int v\, dx + ...$$

$$\int u^n du = \frac{u^{n+1}}{n+1} + c \qquad \text{para } u \neq -1$$

$$\int \frac{du}{u} = ln\, u + c \qquad \int e^u du = e^u + c$$

$$\int \sqrt{u^2 + a^2}\; dx = \frac{u}{2}\sqrt{u^2 + a^2} + \frac{a^2}{2} ln\left(u + \sqrt{u^2 + a^2}\right) + c$$

$$\int \sqrt{u^2 - a^2}\; du = \frac{u}{2}\sqrt{u^2 - a^2} - \frac{a^2}{2} ln\left(u + \sqrt{u^2 - a^2}\right) + c$$

$$\int \sqrt{a^2 - u^2}\, du = \frac{u}{2}\sqrt{a^2 - u^2} + \frac{a^2}{2} arc\ sen\frac{u}{a} + c$$

$$\int \frac{du}{\sqrt{u^2 + a^2}} = ln\left(u + \sqrt{u^2 + a^2}\right) + c$$

$$\int \frac{du}{\sqrt{u^2 - a^2}} = ln\left(u + \sqrt{u^2 - a^2}\right) + c$$

$$\int \frac{du}{\sqrt{a^2 - u^2}} = arc\ sen\frac{u}{a} + c$$

$$\int \frac{du}{u^2 + a^2} = \frac{1}{a} arctan\frac{u}{a} + c$$

$$\int \frac{du}{u^2 - a^2} = \frac{1}{2a} ln\frac{u - a}{u + a} + c$$

$$\int \frac{du}{a^2 - u^2} = \frac{1}{2a} ln\frac{a + u}{a - u} + c$$

$$\int sen u\, du = -cos u + c \qquad \int cos u\, du = sen\, u + c$$

$$\int tan u\, du = ln\, sec u + c \qquad \int cot u\, du = ln\, sen u + c$$

$$\int sec u\, du = ln(tan u + sec u) + c \qquad \int csc u\, du = ln(csc u - cot u) + c$$

$$\int sec^2 u\, du = tan u + c \qquad \int csc^2 u\, du = -cot u + c$$

$$\int tan u\, sec u\, du = tan u + c \qquad \int cot u\, csc u\, du = -csc u + c$$

principales identidades utilizadas en las integrales trigonométricas:

$$sen^2 x + cos^2 x = 1 \qquad tan^2 x + 1 = sec^2 x$$

$$cot^2 x + 1 = csc^2 x \qquad sen^2 x = \frac{1}{2}(1 - cos\, 2x)$$

$$\cos^2 x = \frac{1}{2}(1+\cos 2x) \qquad \operatorname{sen} 2x = 2\operatorname{sen} x \cos x$$

$$\tan x = \frac{\operatorname{sen} x}{\cos x} \qquad \cot x = \frac{\cos x}{\operatorname{sen} x}$$

$$\sec x = \frac{1}{\cos x} \qquad \csc x = \frac{1}{\operatorname{sen} x}$$

integración por partes: $\int u\,dv = uv - \int v\,du$

cambios de variable trigonométricos:

para el radical	hacer el cambio
$\sqrt{a^2x^2 + b^2}$	$x = \frac{b}{a}\tan t$
$\sqrt{a^2x^2 - b^2}$	$x = \frac{b}{a}\sec t$
$\sqrt{b^2 - a^2x^2}$	$x = \frac{b}{a}\operatorname{sen} t$