APÉNDICE A

FORMULARIO

Derivadas:

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

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

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

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

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

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

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

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

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

$$\frac{d}{dx}sen\,u = cos\,u\frac{du}{dx}$$

$$\frac{d}{dx}cos\,u = -sen\,u\frac{du}{dx}$$

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

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

$$\frac{d}{dx}sec\,u = tan\,u\;sec\,u\frac{du}{dx}$$

$$\frac{d}{dx}csc\,u = -cot\,u\;csc\,u\frac{du}{dx}$$

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

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

$$\frac{d}{dx} \operatorname{arc\,tan} u = \frac{\frac{du}{dx}}{1+u^2} \qquad \frac{d}{dx} \operatorname{arc\,cot} u = -\frac{\frac{du}{dx}}{1+u^2}$$

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

Integrales:

$$\int dx = x + c \qquad \int cu\,dx = c\int u\,dx \qquad \int e^u du = e^u + c$$

$$\int x^n dx = \frac{x^{n+1}}{n+1} + c \qquad \int \frac{du}{u} = \ln u + c \qquad \int \frac{dx}{x} = \ln x + c$$

$$\int (u + v + \ldots)\, dx = \int u\, dx + \int v\, dx + \ldots \qquad \int u^n du = \frac{u^{n+1}}{n+1} + c \quad \text{para } u \neq -1$$

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\int sec\, u\, du = ln\left(tan\, u + sec\, u\right) + c$$

$$\int csc\, u\, du = ln\left(csc\, u - cot\, u\right) + c$$

$$\int sec^2 u\, du = tan\, u + c$$

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

$$\int tan\, u\ sec\, u\, du = tan\, u + c$$

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

Principales identidades utilizadas en las integrales trigonométricas:

$$sen^2 x + cos^2 x = 1$$

$$tan^2 x + 1 = sec^2 x$$

$$cot^2 x + 1 = csc^2 x$$

$$sen^2 x = \frac{1}{2}\left(1 - cos\, 2x\right)$$

$$cos^2 x = \frac{1}{2}\left(1 + cos\, 2x\right)$$

$$sen\ 2x = 2\ sen\ x\ cos\ x$$

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

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

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

$$sen\,3x = 3\,sen\,x - 4\,sen^3\,x \qquad \cos 3x = 4\cos^3 x - 3\cos x$$

$$sen\,4x = 4\,sen\,x\cos x - 8\,sen^3\,x\cos x \qquad \cos 4x = 8\cos^4 x - 8\cos^2 x + 1$$

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

cambios de variable trigonométricos:

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