# INTEGRALES

## REGLAS DE INTEGRACIÓN

$$\int k \cdot f(x)\ dx = k \int f(x)\ dx$$

$$\int (f(x) + g(x))\ dx = \int f(x)\ dx + \int g(x)\ dx$$

Integración por partes: $\int u\ dv = u \cdot v - \int v\ du$

## INTEGRALES INMEDIATAS

### *POTENCIAS*

$$\int dx = x + C$$

$$\int x^n\ dx = \frac{x^{n+1}}{n+1} + C \qquad \int [f(x)]^n \cdot f'(x)\ dx = \frac{[f(x)]^{n+1}}{n+1} + C$$

### *EXPONENCIALES*

$$\int e^x\ dx = e^x + C \qquad \int e^{f(x)} \cdot f'(x)\ dx = e^{f(x)} + C$$

$$\int a^x\ dx = \frac{a^x}{\ln a} + C \qquad \int a^{f(x)} \cdot f'(x)\ dx = \frac{a^{f(x)}}{\ln a} + C$$

### *LOGARITMOS*

$$\int \frac{1}{x} dx = \ln x + C \qquad \int \frac{f'(x)}{f(x)} dx = \ln[f(x)] + C$$

### *HIPERBOLICAS*

$$\int \sinh x\ dx = \cosh x + C \qquad \int \sinh[f(x)] \cdot f'(x)\ dx = \cosh[f(x)] + C$$

$$\int \cosh x\ dx = \sinh x + C \qquad \int \cosh[f(x)] \cdot f'(x)\ dx = \sinh[f(x)] + C$$

## *TRIGONOMETRICAS*

$$\int \sin x \ dx = -\cos x + C \qquad \int \sin[(x)] \cdot f'(x) \ dx = -\cos[f(x)] + C$$

$$\int \cos x \ dx = \sin x + C \qquad \int \cos[f(x)] \cdot f'(x) \ dx = \sin[f(x)] + C$$

$$\int \sec^2 x \ dx = \int \frac{1}{\cos^2 x} \ dx = \tan x + C \qquad \int \sec^2[f(x)] \cdot f'(x) \ dx = \tan[f(x)] + C$$

$$\int \csc^2 x \ dx = \int \frac{1}{\sin^2 x} \ dx = -\cot\tan x + C$$

$$\int \sin^2 x \ dx = \frac{x}{2} - \frac{\sin(2x)}{4} + C \qquad \int \cos^2 x \ dx = \frac{x}{2} + \frac{\sin(2x)}{4} + C$$

## *INVERSAS*

$$\int \frac{1}{x^2+1} \ dx = \arctan x + C$$

$$\int \frac{f'(x)}{[f(x)]^2+1} \ dx = \arctan[f(x)] + C \qquad \int \frac{f'(x)}{[f(x)]^2+a^2} \ dx = \frac{1}{a}\arctan[\frac{f(x)}{a}] + C$$

$$\int \frac{1}{1-x^2} \ dx = \arg\tanh x + C$$

$$\int \frac{f'(x)}{1-[f(x)]^2} \ dx = \arg\tanh[f(x)] + C \qquad \int \frac{f'(x)}{a^2-[f(x)]^2} \ dx = \frac{1}{a}\arg\tanh[\frac{f(x)}{a}] + C$$

$$\int \frac{1}{\sqrt{1-x^2}} \ dx = \arcsin x + C$$

$$\int \frac{f'(x)}{\sqrt{1-[f(x)]^2}} \ dx = \arcsin[f(x)] + C \qquad \int \frac{f'(x)}{\sqrt{a^2-[f(x)]^2}} \ dx = \arcsin[\frac{f(x)}{a}] + C$$

$$\int \frac{1}{\sqrt{1+x^2}} \ dx = \arg\sinh x + C$$

$$\int \frac{f'(x9}{\sqrt{1+[f(x)]^2}} \ dx = \arg\sinh[f(x)] + C \qquad \int \frac{f'(x)}{\sqrt{a^2+[f(x)]^2}} \ dx = \arg\sinh[\frac{f(x)}{a}] + C$$

$$\int \frac{1}{\sqrt{x^2-1}} \ dx = \arg\cosh x + C$$

$$\int \frac{f'(x9}{\sqrt{[f(x)]^2-1}} \ dx = \arg\cosh[f(x)] + C \qquad \int \frac{f'(x)}{\sqrt{[f(x)]^2-a^2}} \ dx = \arg\cosh[\frac{f(x)}{a}] + C$$