



Integrales inmediatas

$$\begin{aligned}
 \int k \, dx &= kx + C \\
 \int x^n \, dx &= \frac{x^{n+1}}{n+1} + C \\
 \int e^x \, dx &= e^x + C \\
 \int e^{kx} \, dx &= \frac{e^{kx}}{k} + C \\
 \int \frac{1}{x} \, dx &= \ln |x| + C \\
 \int a^x \, dx &= \frac{a^x}{\ln a} + C \\
 \int \sin x \, dx &= -\cos x + C \\
 \int \cos x \, dx &= \sin x + C \\
 \int \cos 2x \, dx &= \frac{\sin 2x}{2} + C \\
 \int \sin 2x \, dx &= -\frac{\cos 2x}{2} + C \\
 \int \frac{1}{\cos^2 x} \, dx &= \tan x + C \\
 \int \frac{1}{\sin^2 x} \, dx &= -\cot x + C \\
 \int \sec x \, dx &= \ln |\sec x + \tan x| + C \\
 \int \sec^2 x \, dx &= \tan x + C \\
 \int \sec x \tan x \, dx &= \sec x + C \\
 \int \ln x \, dx &= x \ln x - x + C \\
 \int \tan x \, dx &= -\ln |\cos x| + C \\
 &= \ln |\sec x| + C \\
 \int \tan^2 x \, dx &= \tan x - x + C \\
 \int x \sin x \, dx &= \sin x - x \cos x + C \\
 \int x \cos x \, dx &= \cos x + x \sin x + C
 \end{aligned}$$

Integral por partes

$$\int u \, dv = uv - \int v \, du$$

Derivadas

	$(x)' = 1$	$(a^x)' = a^x \ln a$	$\left(\frac{1}{x}\right)' = -\frac{1}{x^2}$
Regla de la cadena:	$(nx)' = x$	$(\sin x)' = \cos x$	
$(f(g))' = f'g \cdot g'$	$(x^n)' = nx^{n-1}$	$(\cos x)' = -\sin x$	$(x^{-2})' = -2x^{-3}$
	$(e^x)' = e^x$	$(\tan x)' = \sec^2 x$	$= -\frac{2}{x^3}$
Regla del producto	$(e^{kx})' = ke^{kx}$	$(\cot x)' = -\csc^2 x$	
$(f \cdot g)' = f'g + fg'$		$(\sec x)' = \sec x \tan x$	
$(k)' = 0$	$(\ln x)' = \frac{1}{x}$	$(\csc x)' = -\csc x \cot x$	$(\sqrt{x})' = \frac{1}{2\sqrt{x}}$



Identidades trigonométricas

$$\begin{array}{lll}\sin^2 x + \cos^2 x = 1 & \csc x = \frac{1}{\sin x} & \sin^2 x = \frac{1 - \cos 2x}{2} \\ \tan x = \frac{\sin x}{\cos x} & \sin 2x = 2 \sin x \cos x & \cos^2 x = \frac{1 + \cos 2x}{2} \\ \cot x = \frac{\cos x}{\sin x} & \cos 2x = \cos^2 x - \sin^2 x & \tan^2 x + 1 = \sec^2 x \\ \sec x = \frac{1}{\cos x} & \cos 2x = 2 \cos^2 x - 1 & \cot^2 x + 1 = \csc^2 x \\ & \cos 2x = 1 - 2 \sin^2 x & \end{array}$$

Propiedades

$$\begin{aligned}\frac{u^{\frac{3}{5}}}{\frac{3}{5}} &= \frac{5}{3} u^{\frac{3}{5}} \\ \frac{1}{u^{2/5}} &= u^{-2/5} \\ \sqrt[n]{u^m} &= u^{m/n}\end{aligned}$$

Teoremas de ecuaciones diferenciales

Teorema 1:

Resolución de una E.D. de variables separables:

Dada la E.D. de variables separables $M(x) dx + N(y) dy = 0$, la solución es:

$$\int M(x) dx + \int N(y) dy = C$$

Teorema 2:

Resolución de una E.D. homogénea:

Dada la E.D. homogénea $M(x,y) dx + N(x,y) dy = 0$, tomamos el cambio de variable $y=ux$, transformándola en una E.D. de variable separable.

$$\begin{aligned}y &= ux \\ dy &= u dx + x du\end{aligned}$$