

**TABLA DE DERIVADAS**

**NOTA:**  $u$  y  $v$  representan, cada una, una expresión en función de  $x$  (aparece  $x$  en la misma), mientras que  $k, n$  y  $a$  son números reales.

PROPIEDADES BÁSICAS	
$y = ku \Rightarrow y' = ku', k \in R$	$y = u \pm v \Rightarrow y' = u' \pm v'$
$y = u \cdot v \Rightarrow y' = u'v + uv'$	$y = \frac{u}{v} \Rightarrow y' = \frac{u'v - uv'}{v^2}$

FUNCIÓN	DERIVADA	Ejemplos	
Constante			
$y = k$	$y' = 0$	$y = 5$	$y' = 0$
Identidad			
$y = x$	$y' = 1$	$y = 4x$	$y' = 4$
Potenciales			
$y = u^n$	$y' = nu^{n-1}u'$	$y = (2x+7)^4$	$y' = 8(2x+7)^3$
$y = \sqrt{u}$	$y' = \frac{u'}{2\sqrt{u}}$	$y = \sqrt{3x}$	$y' = \frac{3}{2\sqrt{3x}}$
$y = \sqrt[n]{u}$	$y' = \frac{u'}{n\sqrt[n]{u^{n-1}}}$	$y = \sqrt[4]{7x}$	$y' = \frac{7}{4\sqrt[4]{(7x)^3}}$
Exponenciales			
$y = e^u$	$y' = u'e^u$	$y = e^{4x+5}$	$y' = 4e^{4x+5}$
$y = a^u$	$y' = u'a^u \ln a$	$y = 3^{7x-5}$	$y' = 7 \cdot 3^{7x-5} \ln 3$
Logarítmicas			
$y = \ln u$ $y = \ln  u $	$y' = \frac{u'}{u}$	$y = \ln(2x+7)$	$y' = \frac{2}{2x+7}$
$y = \log_a u$ $y = \log_a  u $	$y' = \frac{u'}{u} \log_a e = \frac{u'}{u} \frac{1}{\ln a}$	$y = \log_2(3x+4)$	$y' = \frac{3}{3x+4} \log_2 e$
Trigonométricas			
$y = \operatorname{sen} u$	$y' = u' \cos u$	$y = \operatorname{sen} 2x$	$y' = 2 \cos 2x$
$y = \operatorname{cos} u$	$y' = -u' \operatorname{sen} u$	$y = \operatorname{cos} x^3$	$y' = -3x^2 \operatorname{sen} x^3$
$y = \operatorname{tg} u$	$y' = \frac{u'}{\cos^2 u} = u'(1 + \operatorname{tg}^2 u)$	$y = \operatorname{tg} 5x$	$y' = \frac{5}{\cos^2 5x} = 5(1 + \operatorname{tg}^2 5x)$
$y = \operatorname{cotg} u$	$y' = -\frac{u'}{\operatorname{sen}^2 u} = -u'(1 + \operatorname{cotg}^2 u)$	$y = \operatorname{cotg}(3x+2)$	$y' = -\frac{3}{\operatorname{sen}^2(3x+2)}$
$y = \operatorname{sec} u$	$y' = u' \operatorname{sec} u \operatorname{tg} u$	$y' = \operatorname{sec} 3x$	$y' = 3 \operatorname{sec} 3x \operatorname{tg} 3x$
$y = \operatorname{cosec} u$	$y' = -u' \operatorname{cosec} u \operatorname{cotg} u$	$y' = \operatorname{cosec} x^2$	$y' = -2x \operatorname{cosec} x^2 \operatorname{cotg} x^2$
$y = \operatorname{arcsen} u$	$y' = \frac{u'}{\sqrt{1-u^2}}$	$y = \operatorname{arcsen} x^2$	$y' = \frac{2x}{\sqrt{1-x^4}}$
$y = \operatorname{arccos} u$	$y' = -\frac{u'}{\sqrt{1-u^2}}$	$y = \operatorname{arccos} 5x$	$y' = -\frac{5}{\sqrt{1-25x^2}}$
$y = \operatorname{arctg} u$	$y' = \frac{u'}{1+u^2}$	$y = \operatorname{arctg} 2x$	$y' = \frac{2}{1+4x^2}$

**TABLA DE INTEGRALES INMEDIATAS**

NOTA:  $u$  y  $v$  representan expresiones que son funciones de  $x$

PROPIEDADES BÁSICAS	
$\int ku \, dx = k \int u \, dx$	$\int (u \pm v) \, dx = \int u \, dx \pm \int v \, dx$
Integración por partes: $\int u \, dv = uv - \int v \, du$	Cambio de variable: $\int f(u)u' \, dx = \int f(t)dt$ , llamando $t = u(x)$

INTEGRALES INMEDIATAS	Ejemplos
Potenciales	
$\int dx = x + C$	$\int 5dx = 5 \int dx = 5x + C$
$\int u' u^n \, dx = \frac{u^{n+1}}{n+1} + C \quad (n \neq -1)$	$\int x^3 \, dx = \frac{x^4}{4} + C$ ; $\int 3(3x+1)^2 \, dx = \frac{(3x+1)^3}{3} + C$
$\int \frac{u'}{2\sqrt{u}} \, dx = \sqrt{u} + C$	$\int \frac{3x^2}{2\sqrt{x^3+1}} \, dx = \sqrt{x^3+1} + C$
Exponenciales y logarítmicas	
$\int u' e^u \, dx = e^u + C$	$\int 4x^3 e^{x^4+3} \, dx = e^{x^4+3} + C$
$\int u' a^u \, dx = \frac{a^u}{\ln a} + C$	$\int 7 \cdot 2^{7x} \, dx = \frac{2^{7x}}{\ln 2} + C$
$\int \frac{u'}{u} \, dx = \ln u  + C$	$\int \frac{3x^2}{x^3+1} \, dx = \ln x^3+1  + C$
Trigonométricas	
$\int u' \operatorname{sen} u \, dx = -\operatorname{cos} u + C$	$\int 2x \operatorname{sen}(x^2+5) \, dx = -\operatorname{cos}(x^2+5) + C$
$\int u' \operatorname{cos} u \, dx = \operatorname{sen} u + C$	$\int 3x^2 \operatorname{cos}(x^3-1) \, dx = \operatorname{sen}(x^3-1) + C$
$\int u' \operatorname{tg} u \, dx = -\ln \operatorname{cos} u  + C$	$\int (2x+1) \operatorname{tg}(x^2+x) \, dx = -\ln \operatorname{cos}(x^2+x)  + C$
$\int u' \operatorname{cotg} u \, dx = \ln \operatorname{sen} u  + C$	$\int 2x \operatorname{cotg} x^2 \, dx = \ln \operatorname{sen} x^2  + C$
$\int \frac{u'}{\operatorname{cos}^2 u} \, dx = \operatorname{tg} u + C$	$\int \frac{3}{\operatorname{cos}^2 3x} \, dx = \operatorname{tg} 3x + C$
$\int u' \operatorname{sec}^2 u \, dx = \operatorname{tg} u + C$	$\int (3x^2+1) \operatorname{sec}^2(x^3+x+1) \, dx = \operatorname{tg}(x^3+x+1) + C$
$\int u'(1+\operatorname{tg}^2 u) \, dx = \operatorname{tg} u + C$	$\int 2(1+\operatorname{tg}^2 2x) \, dx = \operatorname{tg} 2x + C$
$\int \frac{u'}{\operatorname{sen}^2 u} \, dx = -\operatorname{cotg} u + C$	$\int \frac{2x}{\operatorname{sen}^2 x^2} \, dx = -\operatorname{cotg} x^2 + C$
$\int u' \operatorname{cosec}^2 u \, dx = -\operatorname{cotg} u + C$	$\int (4x^3+1) \operatorname{cosec}^2(x^4+x) \, dx = -\operatorname{cotg}(x^4+x) + C$
$\int u'(1+\operatorname{cotg}^2 u) \, dx = -\operatorname{cotg} u + C$	$\int 3(1+\operatorname{cotg}^2 3x) \, dx = -\operatorname{cotg} 3x + C$
$\int \frac{u'}{\sqrt{1-u^2}} \, dx = \operatorname{arcsen} u + C$	$\int \frac{2dx}{\sqrt{1-4x^2}} = \operatorname{arcsen} 2x + C$
$\int \frac{u'}{1+u^2} \, dx = \operatorname{arctg} u + C$	$\int \frac{e^x}{1+e^{2x}} \, dx = \operatorname{arctg} e^x + C$