

$$\lim_{x \rightarrow a} f(x) = f'(x) = \frac{dy}{dx}; a = \mathcal{R}; y = f(x)$$

Derivadas de una función		Derivadas de una función de función $y = f(u); u = f(x)$
1. $y = cte$	$y' = 0$	
2. $y = x$	$y' = 1$	2a. $y = u$ $y' = u'$
3. $y = c \cdot x$	$y' = c$	3a. $y = c \cdot u$ $y' = c \cdot u'$
 <b>Centro de Estudiantes Tecnológicos A.E.T.I.</b>		4a. $y = u \pm v \pm w \dots$ $y' = u' \pm v' \pm w' \dots$
		5a. $y = u \cdot v$ $y' = u' \cdot v + v' \cdot u$
		6a. $y = \frac{u}{v}$ $y' = \frac{u' \cdot v - u \cdot v'}{v^2}$
		7a. $y = u^v$ $y' = u' \cdot \left[ v \ln u + v \frac{u'}{u} \right]$
8. $y = x^m$	$y' = m \cdot x^{m-1}$	8a. $y = u^m$ $y' = m \cdot u^{m-1} \cdot u'$
9. $y = \sqrt[m]{x}$	$y' = \frac{1}{m \cdot \sqrt[m]{x^{m-1}}}$	9a. $y = \sqrt[m]{u}$ $y' = \frac{u'}{m \cdot \sqrt[m]{x^{m-1}}}$
10. $y = \sqrt{x}$	$y' = \frac{1}{2 \cdot \sqrt{x}}$	10a. $y = \sqrt{u}$ $y' = \frac{u'}{2 \cdot \sqrt{u}}$
11. $y = \log_a(x)$	$y' = \frac{1}{x} \log_a e$	11a. $y = \log_a(u)$ $y' = \frac{u'}{u} \log_a e$
12. $y = \ln(x)$	$y' = \frac{1}{x}$	12a. $y = \ln(u)$ $y' = \frac{u'}{u}$
13. $y = a^x$	$y' = a^x \cdot \ln(a)$	13a. $y = a^u$ $y' = a^u \cdot u' \cdot \ln(a)$
14. $y = e^x$	$y' = e^x$	14a. $y = e^u$ $y' = e^u \cdot u'$
15. $y = \sen(x)$	$y' = \cos(x)$	15a. $y = \sen(u)$ $y' = u' \cdot \cos(u)$
16. $y = \cos(x)$	$y' = -\sen(x)$	16a. $y = \cos(u)$ $y' = -u' \cdot \sen(u)$
17. $y = \tg(x)$	$y' = \frac{1}{\cos^2 x} = 1 + \tg^2 x$ $= \sec^2 x$	17a. $y = \tg(u)$ $y' = \frac{u'}{\cos^2 u} = u' \cdot (1 + \tg^2 u)$ $= u' \cdot (\sec^2 u)$
18. $y = \cotg(x)$	$y' = \frac{-1}{\sen^2 x} = -(1 + \cotg^2 x)$ $= -\cosec^2 x$	18a. $y = \cotg(u)$ $y' = \frac{-u'}{\sen^2 u} = -u' \cdot (1 + \cotg^2 u)$ $= -u' \cdot (\cosec^2 u)$
19. $y = \sec(x)$	$y' = \sec(x) \cdot \tg(x)$	19a. $y = \sec(u)$ $y' = u' \cdot \sec(u) \cdot \tg(u)$
20. $y = \cosec(x)$	$y' = -\cosec(x) \cdot \cotg(x)$	20a. $y = \cosec(u)$ $y' = -u' \cdot \cosec(u) \cdot \cotg(u)$
21. $y = \arcsen(x)$	$y' = \frac{1}{\sqrt{1-x^2}}$	21a. $y = \arcsen(u)$ $y' = \frac{u'}{\sqrt{1-u^2}}$
22. $y = \arccos(x)$	$y' = \frac{-1}{\sqrt{1-x^2}}$	22a. $y = \arccos(u)$ $y' = \frac{-u'}{\sqrt{1-u^2}}$
23. $y = \arctg(x)$	$y' = \frac{1}{1+x^2}$	23a. $y = \arctg(u)$ $y' = \frac{u'}{1+u^2}$
24. $y = \arcotg(x)$	$y' = \frac{-1}{1+x^2}$	24a. $y = \arcotg(u)$ $y' = \frac{-u'}{1+u^2}$
25. $y = \arcsec(x)$	$y' = \frac{1}{x \cdot \sqrt{x^2-1}}$	25a. $y = \arcsec(u)$ $y' = \frac{u'}{u \cdot \sqrt{u^2-1}}$
26. $y = \arccosec(x)$	$y' = \frac{-1}{x \cdot \sqrt{x^2-1}}$	26a. $y = \arccosec(u)$ $y' = \frac{-u'}{u \cdot \sqrt{u^2-1}}$

$$y' = \frac{dy}{dx} ; dy = y'.dx \rightarrow y = \int y'.dx$$

<b>Integrales inmediatas con una variable independiente</b>	Integrales inmediatas de funciones $u = f(x)$
1. $\int [f_1(x) \pm f_2(x) \pm \dots \pm f_a(x)] dx = \int f_1(x) dx \pm f_2(x) dx \pm \dots \pm f_a(x) dx$ 2. $\int u . dx = u . v - \int v . du$ (integración por partes)	 Centro de Estudiantes Tecnológicos <b>A.E.T.I.</b>
3. $\int dx = x + c$ (c: cte. de integración)	
4. $\int x^m . dx = \frac{x^{m+1}}{m+1} + c \quad (\forall m \neq -1)$	4. $\int u^m . w . dx = \frac{u^{m+1}}{m+1} + c \quad (\forall m \neq -1)$
5. $\int \frac{1}{x} . dx = \ln x  + c$	5. $\int \frac{1}{u} . w . dx = \ln u  + c$
6. $\int e^x . dx = e^x + c$	6. $\int e^u . w . dx = e^u + c$
7. $\int a^x . dx = \frac{a^x}{\ln(a)} + c$	7. $\int a^u . w . dx = \frac{a^u}{\ln a} + c$
8. $\int \sen(x) . dx = -\cos(x) + c$	8. $\int \sen(u) . w . dx = -\cos(u) + c$
9. $\int \cos(x) . dx = \sen(x) + c$	9. $\int \cos(u) . w . dx = \sen(u) + c$
10. $\int \tg(x) . dx = \ln \sec(x)  + c = -\ln \cos(x)  + c$	10. $\int \tg(u) . w . dx = \ln \sec(u)  + c = -\ln \cos(u)  + c$
11. $\int \cosec(x) . dx = \ln \cosec(x) - \cotg(x)  + c$	11. $\int \cosec(u) . w . dx = \ln \cosec(u) - \cotg(u)  + c$
12. $\int \sec(x) . dx = \ln \sec(x) + \tg(x)  + c$	12. $\int \sec(u) . w . dx = \ln \sec(u) + \tg(u)  + c$
13. $\int \cotg(x) . dx = \ln \sen(x)  + c$	13. $\int \cotg(u) . w . dx = \ln \sen(u)  + c$
14. $\int \frac{1}{\cos^2 x} . dx = \int \sec^2(x) . dx = \tg(x) + c$	14. $\int \frac{1}{\cos^2 u} . w . dx = \int \sec^2(u) . dx = \tg(u) + c$
15. $\int \frac{1}{\sen^2 x} . dx = \int \cosec^2(x) . dx = -\cotg(x) + c$	15. $\int \frac{1}{\sen^2 u} . w . dx = \int \cosec^2(u) . dx = -\cotg(u) + c$
16. $\int \sec(x) . \tg(x) . dx = \sec(x) + c$	16. $\int \sec(u) . \tg(u) . w . dx = \sec(u) + c$
17. $\int \cosec(x) . \cotg(x) . dx = -\cosec x + c$	17. $\int \cosec(u) . \cotg(u) . w . dx = -\cosec u + c$
18. $\int \frac{1}{\sqrt{1-x^2}} . dx = \begin{cases} \arcsen(x) + c \\ -\arccos(x) + c \end{cases}$	18. $\int \frac{1}{\sqrt{1-u^2}} . w . dx = \begin{cases} \arcsen(u) + c \\ -\arccos(u) + c \end{cases}$
19. $\int \frac{1}{1+x^2} . dx = \begin{cases} \arctg(x) + c \\ -\arccotg(x) + c \end{cases}$	19. $\int \frac{1}{1+u^2} . w . dx = \begin{cases} \arctg(u) + c \\ -\arccotg(u) + c \end{cases}$
20. $\int \frac{1}{x\sqrt{x^2-1}} . dx = \begin{cases} \arcsec(x) + c \\ -\arccosec(x) + c \end{cases}$	20. $\int \frac{1}{u\sqrt{u^2-1}} . w . dx = \begin{cases} \arcsec(u) + c \\ -\arccosec(u) + c \end{cases}$