



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

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

Integrales inmediatas con una variable independiente	Integrales inmediatas de funciones $u = f(x)$
1. $\int [f_1(x) \pm f_2(x) \pm \dots \pm f_n(x)] dx = \int f_1(x) dx \pm \int f_2(x) dx \pm \dots \pm \int f_n(x) dx$	 <p style="text-align: right;">Centro de Estudiantes Tecnológicos A.E.T.I.</p>
2. $\int u \cdot v' dx = u \cdot v - \int v \cdot u' dx$ (integración por partes)	
3. $\int dx = x + c$ (c: cte. de integración)	
4. $\int x^m \cdot dx = \frac{x^{m+1}}{m+1} + c$ ($\forall m \neq -1$)	4. $\int u^m \cdot u' dx = \frac{u^{m+1}}{m+1} + c$ ($\forall m \neq -1$)
5. $\int \frac{1}{x} \cdot dx = \ln x + c$	5. $\int \frac{1}{u} \cdot u' dx = \ln u + c$
6. $\int e^x \cdot dx = e^x + c$	6. $\int e^u \cdot u' dx = e^u + c$
7. $\int a^x \cdot dx = \frac{a^x}{\ln(a)} + c$	7. $\int a^u \cdot u' dx = \frac{a^u}{\ln a} + c$
8. $\int \sin(x) \cdot dx = -\cos(x) + c$	8. $\int \sin(u) \cdot u' dx = -\cos(u) + c$
9. $\int \cos(x) \cdot dx = \sin(x) + c$	9. $\int \cos(u) \cdot u' dx = \sin(u) + c$
10. $\int \operatorname{tg}(x) \cdot dx = \ln \sec(x) + c = -\ln \cos(x) + c$	10. $\int \operatorname{tg}(u) \cdot u' dx = \ln \sec(u) + c = -\ln \cos(u) + c$
11. $\int \operatorname{cosec}(x) \cdot dx = \ln \operatorname{cosec}(x) - \cotg(x) + c$	11. $\int \operatorname{cosec}(u) \cdot u' dx = \ln \operatorname{cosec}(u) - \cotg(u) + c$
12. $\int \sec(x) \cdot dx = \ln \sec(x) + \operatorname{tg}(x) + c$	12. $\int \sec(u) \cdot u' dx = \ln \sec(u) + \operatorname{tg}(u) + c$
13. $\int \cotg(x) \cdot dx = \ln \sin(x) + c$	13. $\int \cotg(u) \cdot u' dx = \ln \sin(u) + c$
14. $\int \frac{1}{\cos^2 x} \cdot dx = \int \sec^2(x) \cdot dx = \operatorname{tg}(x) + c$	14. $\int \frac{1}{\cos^2 u} \cdot u' dx = \int \sec^2(u) \cdot dx = \operatorname{tg}(u) + c$
15. $\int \frac{1}{\sin^2 x} \cdot dx = \int \operatorname{cosec}^2(x) \cdot dx = -\cotg(x) + c$	15. $\int \frac{1}{\sin^2 u} \cdot u' dx = \int \operatorname{cosec}^2(u) \cdot dx = -\cotg(u) + c$
16. $\int \sec(x) \cdot \operatorname{tg}(x) \cdot dx = \sec(x) + c$	16. $\int \sec(u) \cdot \operatorname{tg}(u) \cdot u' dx = \sec(u) + c$
17. $\int \operatorname{cosec}(x) \cdot \cotg(x) \cdot dx = -\operatorname{cosec} x + c$	17. $\int \operatorname{cosec}(u) \cdot \cotg(u) \cdot u' dx = -\operatorname{cosec} u + c$
18. $\int \frac{1}{\sqrt{1-x^2}} \cdot dx = \begin{cases} \operatorname{arcsen}(x) + c \\ -\arccos(x) + c \end{cases}$	18. $\int \frac{1}{\sqrt{1-u^2}} \cdot u' dx = \begin{cases} \operatorname{arcsen}(u) + c \\ -\arccos(u) + c \end{cases}$
19. $\int \frac{1}{1+x^2} \cdot dx = \begin{cases} \operatorname{arctg}(x) + c \\ -\operatorname{arccotg}(x) + c \end{cases}$	19. $\int \frac{1}{1+u^2} \cdot u' dx = \begin{cases} \operatorname{arctg}(u) + c \\ -\operatorname{arccotg}(u) + c \end{cases}$
20. $\int \frac{1}{x \cdot \sqrt{x^2-1}} \cdot dx = \begin{cases} \operatorname{arcsec}(x) + c \\ -\operatorname{arccosec}(x) + c \end{cases}$	20. $\int \frac{1}{u \cdot \sqrt{u^2-1}} \cdot u' dx = \begin{cases} \operatorname{arcsec}(u) + c \\ -\operatorname{arccosec}(u) + c \end{cases}$