

Derivate

Regole di derivazioni: semplici

1. $Dk = 0$
2. $Dx = 1$
3. $Dx^n = nx^{n-1}$
4. $D \log_a x = \frac{1}{x} \log_a e = \frac{1}{x \ln a}$
5. $D \ln x = \frac{1}{x}$
6. $Da^x = a^x \ln a$
7. $De^x = e^x$
8. $D \sqrt{x} = \frac{1}{2\sqrt{x}}$
9. $D \sqrt[n]{x} = \frac{m}{n \sqrt[n]{x^{n-m}}}$
10. $D \sin x = \cos x$
11. $D \cos x = -\sin x$

Operazioni:

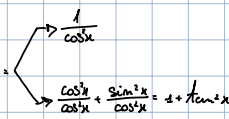
SOMMA: $D(f(x) + g(x)) = f'(x) + g'(x)$

$Dk \cdot f(x) = k \cdot f'(x)$

PRODOTTO: $D(f(x) \cdot g(x)) = f'(x) \cdot g(x) + f(x) \cdot g'(x)$

QUOZIENTE: $D \frac{f(x)}{g(x)} = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{(g(x))^2}$

TANGENTE: $D \tan x = D \frac{\sin x}{\cos x} = \frac{\cos x \cdot \cos x - \sin x \cdot (-\sin x)}{\cos^2 x} = \frac{\cos^2 x + \sin^2 x}{\cos^2 x}$



COTANGENTE: $D \cot x = -\frac{1}{\sin^2 x} = -(1 + \cot^2 x)$

Derivate composte

$Df(g(x)) = f'(g(x)) \cdot g'(x)$

Dall'esterno verso l'interno

1. $D \sqrt{g(x)} = \frac{1}{2\sqrt{g(x)}} \cdot g'(x)$
2. $D \sqrt[m]{g(x)} = \frac{m}{m \sqrt[m]{g(x)^{m-1}}} \cdot g'(x)$
3. $D \log_a g(x) = \frac{1}{g(x) \ln a} \cdot g'(x)$
4. $D \ln g(x) = \frac{1}{g(x)} \cdot g'(x)$
5. $Da^{g(x)} = a^{g(x)} \cdot \ln a \cdot g'(x)$
6. $De^{g(x)} = e^{g(x)} \cdot g'(x)$
7. $D \sin g(x) = \cos g(x) \cdot g'(x)$
7. $D \cos g(x) = -\sin g(x) \cdot g'(x)$
9. $D \tan g(x) = (1 + \tan^2 g(x)) \cdot g'(x)$
10. $D \cot g(x) = -(1 + \cot^2 g(x)) \cdot g'(x)$
11. $D \arcsin g(x) = \frac{1}{\sqrt{1-g(x)^2}} \cdot g'(x)$
12. $D \arccos g(x) = -\frac{1}{\sqrt{1-g(x)^2}} \cdot g'(x)$
13. $D \arctan g(x) = \frac{1}{1+g(x)^2} \cdot g'(x)$
14. $D \operatorname{arccot} g(x) = -\frac{1}{1+g(x)^2} \cdot g'(x)$
15. $D f^{g(x)} = D e^{g(x) \cdot \ln f(x)} = e^{g(x) \cdot \ln f(x)} \left\{ g'(x) \cdot \ln f(x) + g(x) \cdot \frac{f'(x)}{f(x)} \right\}$
 $\left(e^{\ln f(x)} \right)^{g(x)} = e^{g(x) \ln f(x)}$