Formule e regole di derivazione – Schema applicativo

Funzioni elementari

$y = k$	$y' = 0$
$y = x$	$y' = 1$
$y = x^{\alpha}$ $y = \sqrt{x} = x^{\frac{1}{2}}$ $y = \sqrt[n]{x^m}$	$y' = \alpha\, x^{\alpha-1}$ $y' = \frac{1}{2\sqrt{x}}$ $y' = \frac{m}{n} \times \frac{1}{\sqrt[n]{x^{n-m}}}$
$y = a^x$ $y = e^x$	$y = a^x \times \ln(a)$ $y' = e^x$
$y = \log_a x$ $y = \ln x$	$y' = \frac{1}{x} \times \frac{1}{\ln a}$ $y' = \frac{1}{x}$
$y = \sin x$	$y' = \cos x$
$y = \cos x$	$y' = -\sin x$
$y = \tan x$	$y' = \frac{1}{\cos^2 x}$
$y = \arcsin x$	$y' = \frac{1}{\sqrt{1 - x^2}}$
$y = \arccos x$	$y' = -\frac{1}{\sqrt{1 - x^2}}$
$y = \arctan x$	$y' = \frac{1}{1 + x^2}$
$y = \sinh x$	$y' = \cosh x$
$y = \cosh x$	$y' = \sinh x$

Funzioni composte

$y = f(x)^{\alpha}$	$y' = \alpha\, f(x)^{\alpha-1} \times f'(x)$
$y = a^{f(x)}$ $y = e^{f(x)}$	$y = a^{f(x)} \times \ln(a) \times f'(x)$ $y' = e^{f(x)} \times f'(x)$
$y = \log_a f(x)$ $y = \ln f(x)$	$y' = \frac{1}{f(x)} \times \frac{1}{\ln a} \times f'(x)$ $y' = \frac{1}{f(x)} \times f'(x)$
$y = \sin f(x)$	$y' = \cos f(x) \times f'(x)$
$y = \cos f(x)$	$y' = -\sin f(x) \times f'(x)$
$y = h(f(x))$	$y' = h'(f(x)) \times f'(x)$
$y = \tan f(x)$	$y' = \frac{1}{\cos^2 f(x)} \times f'(x)$
$y = \arcsin f(x)$	$y' = \frac{1}{\sqrt{1 - f(x)^2}} \times f'(x)$
$y = \arccos f(x)$	$y' = -\frac{1}{\sqrt{1 - f(x)^2}} \times f'(x)$
$y = \arctan f(x)$	$y' = \frac{1}{1 + f(x)^2} \times f'(x)$
$y = \sinh f(x)$	$y' = \cosh f(x) \times f'(x)$
$y = \cosh f(x)$	$y' = \sinh f(x) \times f'(x)$

Regole di derivazione del prodotto e del quoziente

$$D[f(x) \times g(x)] = f'(x) \times g(x) + f(x) \times g'(x)$$

$$D\left[\frac{f(x)}{g(x)}\right] = \frac{f'(x) \times g(x) - f(x) \times g'(x)}{g(x)^2}$$