

Reguli de derivare

$$1. (\mathbf{a} \cdot f)' = \mathbf{a} \cdot f' ;$$

$$2. (f \pm g)' = f' \pm g' ;$$

$$3. \left(\sum_{k=1}^n f_k \right)' = \sum_{k=1}^n f_k' ;$$

$$4. (f \cdot g)' = f'g + g'f ;$$

$$5. \left(\prod_{k=1}^n f_k \right)' = \sum_{k=1}^n \left(f_1 \cdot f_2 \cdot \dots \cdot f_k' \cdot \dots \cdot f_n \right) ;$$

$$6. \left(\frac{f}{g} \right)' = \frac{f'g - g'f}{g^2} ;$$

$$7. \left(\frac{1}{g} \right)' = \frac{-g'}{g^2} ;$$

$$8. (f(u))' = f'(u) \cdot u' ;$$

$$9. (f(u(v)))' = f'(u(v)) \cdot u'(v) \cdot v' .$$

$$10. \left(f^{-1} \right)' = \frac{1}{f'(f^{-1})} \text{ sau } \left(f^{-1} \right)'(y_0) = \frac{1}{f'(x_0)}, \text{ unde}$$

$$y_0 = f(x_0).$$

Tabel de derivare al functiilor elementare

Nr.	Funcția	Derivata	Domeniul de derivabilitate
1	c (constanta)	0	$x \in \mathbf{R}$
2	x	1	$x \in \mathbf{R}$
3	$ x $	x $\frac{1}{ x }$	$x \neq 0$
4	$x^n, n \in \mathbf{N}^*$	nx^{n-1}	$x \in \mathbf{R}$
5	$x^r, r \in \mathbf{R}$	rx^{r-1}	$x \in (0, \infty)$
6	\sqrt{x}	$\frac{1}{2\sqrt{x}}$	$x \in (0, \infty)$
7	$\sqrt[n]{x}, n \in \mathbf{N}^*$	$\frac{1}{n\sqrt[n]{x^{n-1}}}$	$x \in (0, \infty)$ daca n este par $x \neq 0$ daca n este impar
8	$\ln x$	$\frac{1}{x}$	$x \in (0, \infty)$
9	$\ln x $	$\frac{1}{x}$	$x \neq 0$
10	$\log_a x$	$\frac{1}{x \ln a}$	$x \in (0, \infty)$
11	e^x	e^x	$x \in \mathbf{R}$
12	$a^x, a > 0, a \neq 1$	$a^x \ln a$	$x \in \mathbf{R}$
13	$\sin x$	$\cos x$	$x \in \mathbf{R}$
14	$\cos x$	$-\sin x$	$x \in \mathbf{R}$
15	$\operatorname{tg} x$	$\frac{1}{\cos^2 x} = 1 + \operatorname{tg}^2 x$	$x \neq \frac{p}{2} + kp, k \in \mathbf{Z}$
16	$\operatorname{ctg} x$	$-\frac{1}{\sin^2 x} = -(1 + \operatorname{ctg}^2 x)$	$x \neq kp, k \in \mathbf{Z}$
17	$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$	$x \in (-1, 1)$
18	$\arccos x$	$-\frac{1}{\sqrt{1-x^2}}$	$x \in (-1, 1)$
19	$\operatorname{arctg} x$	$\frac{1}{1+x^2}$	$x \in \mathbf{R}$
20	$\operatorname{arcctg} x$	$-\frac{1}{1+x^2}$	$x \in \mathbf{R}$
21	$\operatorname{ch} x = \frac{e^x + e^{-x}}{2}$	$\operatorname{sh} x = \frac{e^x - e^{-x}}{2}$	$x \in \mathbf{R}$
22	$\operatorname{sh} x = \frac{e^x - e^{-x}}{2}$	$\operatorname{ch} x = \frac{e^x + e^{-x}}{2}$	$x \in \mathbf{R}$

Tabel de derivare al functiilor compuse

Nr.	Functia	Derivata	Coditii de derivabilitate
1	$u^n, n \in \mathbf{N}^*$	$n \cdot u^{n-1} \cdot u'$	
2	$u^r, r \in \mathbf{R}$	$r \cdot u^{r-1} \cdot u'$	$u > 0$
3	\sqrt{u}	$\frac{u'}{2\sqrt{u}}$	$u > 0$
4	$\sqrt[n]{u}$	$\frac{u'}{n \cdot \sqrt[n]{u^{n-1}}}$	$u > 0$ pentru n par $u \neq 0$ pentru n impar
5	$\ln u$	$\frac{u'}{u}$	$u \neq 0$
6	$\ln u $	$\frac{u'}{u}$	$u \neq 0$
7	$\log_a u$	$\frac{u'}{u \cdot \ln a}$	$u > 0$
8	e^u	$e^u \cdot u'$	
9	$a^u,$ $a > 0, a \neq 1$	$a^u \cdot u' \cdot \ln a$	
10	$\sin u$	$\cos u \cdot u'$	
11	$\cos u$	$-\sin u \cdot u'$	
12	$\operatorname{tg} u$	$\frac{1}{\cos^2 u} \cdot u' = (1 + \operatorname{tg}^2 u) \cdot u'$	$\cos u \neq 0$
13	$\operatorname{ctg} u$	$-\frac{1}{\sin^2 u} \cdot u' = -(1 + \operatorname{ctg}^2 u) \cdot u'$	$\sin u \neq 0$
14	$\arcsin u$	$\frac{u'}{\sqrt{1-u^2}}$	$u^2 < 1$
15	$\arccos u$	$-\frac{u'}{\sqrt{1-u^2}}$	$u^2 < 1$
16	$\operatorname{arctg} u$	$\frac{1}{1+u^2} \cdot u'$	
17	$\operatorname{arcctg} u$	$-\frac{1}{1+u^2} \cdot u'$	
18	$\operatorname{sh} u$	$\operatorname{ch} u \cdot u'$	
19	$\operatorname{ch} u$	$\operatorname{sh} u \cdot u'$	
20	u^v	$u^v \cdot \ln u \cdot v' + v \cdot u^{v-1} \cdot u'$	