1 Wzory na pochodne wybranych funkcji

$$c \in \mathbb{R} \qquad \alpha \in \mathbb{R}$$

$$\begin{array}{ccc}
c' = 0, & & \\
(x^a)' = ax^{a-1}, & (a^x)' = a^x \ln a, & (e^x)' = e^x, \\
(\log_a x)' = \dfrac{1}{x \cdot \ln a}, & (\ln x)' = \dfrac{1}{x} & (\sin x)' = \cos x, \\
(\cos x)' = -\sin x, & (\mathrm{tg}\ x)' = \dfrac{1}{\cos^2 x}, & (\mathrm{ctg}\ x)' = \dfrac{-1}{\sin^2 x}, \\
(\arcsin x)' = \dfrac{1}{\sqrt{1-x^2}}, & (\arccos x)' = \dfrac{-1}{\sqrt{1-x^2}}, & (\mathrm{arctan})' = \dfrac{1}{1+x^2}, \\
(\mathrm{arcctg}\ x)' = \dfrac{-1}{1+x^2}, & (\sinh x)' = \cosh x, & (\cosh x)' = \sinh x, \\
(\mathrm{tgh}\ x)' = \dfrac{1}{\cosh^2 x}, & (\mathrm{ctgh}\ x)' = \dfrac{-1}{\sinh^2 x} &
\end{array}$$

2 Pochodna sumy, różnicy, iloczynu, ilorazu funkcji

$$(f(x) + g(x))' = f'(x) + g'(x) \tag{1}$$

$$(c \cdot f(x))' = c \cdot f'(x), \qquad c - \text{liczba} \tag{2}$$

$$(f(x) \cdot g(x))' = f'(x) \cdot g(x) + f(x) \cdot g'(x) \tag{3}$$

$$\left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{g^2(x)}, \qquad \text{o ile } g \neq 0 \tag{4}$$

$$\tag{5}$$

3 Pochodna funkcji złożonej

Dana jest funkcja złozona $y = (g^{\circ}w)(x)$ czyli $y = g(w(x))$.
$w = w(x)$ - funkcja wewnętrzna
$y = g(w)$ - funkcja zewnętrzna

3.1 Wzory na pochodne funkcji złożonych

$c \in \mathbb{R}$ $\qquad$ $\alpha \in \mathbb{R}$

$$c' = 0,$$

$$(w^a)' = aw^{a-1} \cdot w', \qquad (a^w)' = a \cdot w^{a-1} \cdot w', \qquad (e^w)' = e^w \cdot w',$$

$$(\log_a w)' = \frac{1}{w \cdot \ln a} \cdot w', \qquad (\ln)' = \frac{1}{w} \cdot w',$$

$$(\sin w)' = (\cos w) \cdot w', \qquad (\cos w)' = (-\sin w) \cdot w', \qquad (\text{ctg } w)' = \frac{1}{\sin^2 w} \cdot w',$$

$$(\text{tg } w)' = \frac{1}{\cos^2 w} \cdot w', \qquad (\arcsin w)' = \frac{1}{\sqrt{1 - w^2} \cdot w'} \qquad (\text{arcctg } w)' = \frac{1}{1 + w^2} \cdot w',$$

$$(\sinh w)' = (\cosh w) \cdot w', \qquad (\cosh w)' = (\sinh w) \cdot w', \qquad (\text{tgh } w)' = \frac{1}{\cosh^2 w} \cdot w',$$

$$(\text{ctgh } w) = \frac{-1}{\cosh^2 w} \cdot w',$$