

1 Wzory na pochodne wybranych funkcji

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

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

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

2 Pochodna sumy, różnicy, iloczynu, ilorazu funkcji

$$(f(x) + g(x))' = f'(x) + g'(x) \quad (1)$$

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

$$(f(x) \cdot g(x))' = f'(x) \cdot g(x) + f(x) \cdot g'(x) \quad (3)$$

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

$$(5)$$

3 Pochodna funkcji złożonej

Dana jest funkcja złożona $y = (g \circ w)(x)$ czyli $y = g(w(x))$.

$w = w(x)$ - funkcja wewnętrzna

$y = g(w)$ - funkcja zewnętrzna

3.1 Wzory na pochodne funkcji złożonych

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

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

$$c' = 0,$$

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

$$(a^w)' = a^w \ln a \cdot w',$$

$$(e^w)' = e^w \cdot w',$$

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

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

$$(\sin w)' = (\cos w) \cdot w',$$

$$(\cos w)' = (-\sin w) \cdot w',$$

$$(\operatorname{tg} w)' = \frac{1}{\cos^2 w} \cdot w',$$

$$(\operatorname{ctg} w)' = \frac{1}{\sin^2 w} \cdot w',$$

$$(\arcsin w)' = \frac{1}{\sqrt{1-w^2}} \cdot w'$$

$$(\arccos w)' = \frac{1}{\sqrt{1-w^2}} \cdot w'$$

$$(\operatorname{arctg} w)' = \frac{1}{1+w^2} \cdot w',$$

$$(\operatorname{arcctg} w)' = \frac{-1}{1+w^2} \cdot w',$$

$$(\sinh w)' = (\cosh w) \cdot w',$$

$$(\cosh w)' = (\sinh w) \cdot w',$$

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

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