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

1 Wzory na pochodne wybranych funkcji

$$c' = 0,$$

$$(x^a)' = ax^{a-1}, \qquad (a^x)' = a^x \ln a, \qquad (e^x)' = e^x,$$

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

$$(\sin x)' = \cos x, \qquad (\cos x)' = -\sin x, \qquad (\mathrm{tg}\ x)' = \frac{1}{\cos^2 x},$$

$$(\mathrm{ctg}\ x)' = \frac{-1}{\sin^2 x},$$

$$(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}, \qquad (\arccos x)' = \frac{-1}{\sqrt{1-x^2}}, \qquad (\mathrm{arctg}\ x)' = \frac{1}{1+x^2},$$

$$(\mathrm{arcctg}\ x)' = \frac{-1}{1+x^2},$$

$$(\sinh x)' = \cosh x, \qquad (\cosh x)' = \sinh x, \qquad (\mathrm{tgh}\ x)' = \frac{1}{\cosh^2 x},$$

$$(\mathrm{ctgh}\ x)' = \frac{-1}{\sinh^2 x}$$

2 Pochodna sumy, różnicy, iloczynu, ilorazu funkcji

$$(f(x) + g(x))' = f'(x) + g'(x)$$

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

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

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

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

$$c' = 0,$$

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

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

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

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

$$(\arcsin w)' = \frac{1}{\sqrt{1-w^2} \cdot w'} \qquad (\arccos w)' = \frac{1}{\sqrt{1+w^2}} \cdot w' \qquad (\mathrm{arctg}\ w)' = \frac{1}{1+w^2} \cdot w',$$

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

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

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