WZORY

1. Pochodne funkcji elementarnych:

   (a) $(c)' = 0$;

   (b) $(x^{\alpha})' = \alpha x^{\alpha-1}$ dla $\alpha \in \mathbb{R}$

   (c) $(\sin x)' = \cos x$;

   (d) $(\cos x)' = -\sin x$;

   (e) $(\operatorname{tg} x)' = \frac{1}{\cos^2 x}$;

   (f) $(\operatorname{ctg} x)' = -\frac{1}{\sin^2 x}$;

   (g) $(a^x)' = a^x \ln a, (e^x)' = e^x$;

   (h) $(\log_a x)' = \frac{1}{x \ln a}, (\ln x)' = \frac{1}{x}$;

   (i) $(\arcsin x)' = \frac{1}{\sqrt{1-x^2}}$;

   (j) $(\arccos x)' = -\frac{1}{\sqrt{1-x^2}}$;

   (k) $(\operatorname{arctg} x)' = \frac{1}{1+x^2}$;

   (l) $(\operatorname{arcctg} x)' = -\frac{1}{1+x^2}$.

2. Reguły różniczkowania:

   (a) $(f(x) \pm g(x))' = f'(x) \pm g'(x)$;

   (b) $(c \cdot f(x))' = c \cdot f'(x)$;

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

   (d) $\left(\frac{f}{g}\right)'(x) = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{[g(x)]^2}$, o ile $g(x) \neq 0$;

   (e) $(g(f(x)))' = g'(f(x)) \cdot f'(x)$.

3. Całki z funkcji elementarnych:

   (a) $\int 0 dx = C$,

   (b) $\int x^{\alpha} dx = \frac{1}{\alpha+1} x^{\alpha+1} + C$ dla $\alpha \neq -1$,

   (c) $\int \frac{dx}{x} = \ln |x| + C$,

   (d) $\int e^x dx = e^x + C$,

   (e) $\int a^x dx = \frac{a^x}{\ln a} + C$ dla $0 < a \neq 1$,

   (f) $\int \sin x dx = -\cos x + C$,

   (g) $\int \cos x dx = \sin x + C$,

   (h) $\int \frac{dx}{\sin^2 x} = -\operatorname{ctg} x + C$,

   (i) $\int \frac{dx}{\cos^2 x} = \operatorname{tg} x + C$,

   (j) $\int \frac{dx}{1+x^2} = \operatorname{arctg} x + C$,

   (k) $\int \frac{dx}{\sqrt{1-x^2}} = \arcsin x + C$,

   (l) $\int \frac{f'(x)}{f(x)} dx = \ln |f(x)| + C$.

4. Wzór na całkowanie przez części

$$\int f(x) g'(x) dx = f(x) g(x) - \int f'(x) g(x) dx.$$