

$$\lim_{n \rightarrow \infty} \sqrt[n]{a} = 1 \quad \text{pre } a > 1 \quad \lim_{n \rightarrow \infty} \sqrt[n]{n} = 1 \quad \lim_{n \rightarrow \infty} \sqrt[n]{n!} = \infty \quad \lim_{x \rightarrow 0} \frac{\sin x}{x} = \lim_{x \rightarrow 0} \frac{x}{\sin x} = 1$$

$$\lim_{n \rightarrow \infty} \frac{n!}{n^n} = 0 \quad \lim_{n \rightarrow \infty} \frac{n^n}{n!} = \infty \quad \lim_{n \rightarrow \infty} \frac{n!}{n^k} = \infty \quad \text{pre } k \in \mathbb{N} \quad \lim_{n \rightarrow \infty} \frac{n^k}{n!} = 0 \quad \text{pre } k \in \mathbb{N}$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e \quad \lim_{x \rightarrow 0} (1+x)^{\frac{1}{x}} = e \quad \lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^x = e$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{a}{n}\right)^n = e^a \quad \text{pre } a \in \mathbb{R} \quad \lim_{x \rightarrow 0} (1+ax)^{\frac{1}{x}} = e^a \quad \text{pre } a \in \mathbb{R} \quad \lim_{x \rightarrow \infty} \left(1 + \frac{a}{x}\right)^x = e^a \quad \text{pre } a \in \mathbb{R}$$

$$\lim_{n \rightarrow \infty} n(\sqrt[n]{e} - 1) = 1 \quad \lim_{n \rightarrow \infty} n(\sqrt[n]{a} - 1) = \ln a \quad \lim_{x \rightarrow 0} \frac{a^x - 1}{x} = \ln a \quad \lim_{x \rightarrow 0} \frac{e^x - 1}{x} = \ln e = 1$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{1!} + \dots + \frac{1}{n!}\right) = \sum_{n=0}^{\infty} \frac{1}{n!} = e \quad \sum_{n=0}^{\infty} \frac{(-1)^n}{n!} = \frac{1}{e} \quad \sum_{n=0}^{\infty} q^n = \frac{1}{1-q} \quad \text{pre } q \in (-1; 1) \quad \sum_{n=1}^{\infty} \frac{1}{n^p} = \begin{cases} \infty & \text{pre } p \in (0; 1) \\ \text{---} & \text{pre } p \in (1; \infty) \end{cases}$$

$$(cf)' = cf' \quad (f \pm g)' = f' \pm g' \quad (fg)' = f'g + fg' \quad \left[\frac{f}{g}\right]' = \frac{f'g - fg'}{g^2}$$

$$[\text{konšt.}]' = 0 \quad [x]' = 1 \quad \int dx = \int 1 dx = x + c \quad [x^a]' = ax^{a-1} \quad \int x^a dx = \frac{x^{a+1}}{a+1} + c \quad \text{pre } a \in \mathbb{R}$$

$$[e^x]' = e^x \quad \int e^{ax} dx = \frac{e^{ax}}{a} + c \quad [a^x]' = a^x \ln a \quad \int a^x dx = \frac{a^x}{\ln a} + c \quad \text{pre } a > 0$$

$$[\ln x]' = \frac{1}{x} \quad \int \frac{dx}{x} = \ln |x| + c \quad \int \frac{f'(x)}{f(x)} dx = \ln |f(x)| + c \quad \text{pre } a > 0, a \neq 1$$

$$[\sin x]' = \cos x \quad \int \cos ax dx = \frac{\sin ax}{a} + c \quad [\cos x]' = -\sin x \quad \int \sin ax dx = -\frac{\cos ax}{a} + c$$

$$[\sinh x]' = \cosh x \quad \int \cosh ax dx = \frac{\sinh ax}{a} + c \quad [\cosh x]' = \sinh x \quad \int \sinh ax dx = \frac{\cosh ax}{a} + c$$

$$[\text{tg } x]' = \frac{1}{\cos^2 x} \quad \int \frac{dx}{\cos^2 ax} = \frac{\text{tg } ax}{a} + c \quad [\text{cotg } x]' = -\frac{1}{\sin^2 x} \quad \int \frac{dx}{\sin^2 ax} = -\frac{\text{cotg } ax}{a} + c$$

$$[\text{tgh } x]' = \frac{1}{\cosh^2 x} \quad \int \frac{dx}{\cosh^2 ax} = \frac{\text{tgh } ax}{a} + c \quad [\text{cotgh } x]' = -\frac{1}{\sinh^2 x} \quad \int \frac{dx}{\sinh^2 ax} = -\frac{\text{cotgh } ax}{a} + c$$

$$[\arcsin x]' = \frac{1}{\sqrt{1-x^2}} \quad [\arccos x]' = -\frac{1}{\sqrt{1-x^2}} \quad \int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin \frac{x}{|a|} + c_1 = -\arccos \frac{x}{|a|} + c_2$$

$$\int \frac{dx}{\sqrt{x^2-a^2}} = \ln |x + \sqrt{x^2-a^2}| + c \quad \int \frac{dx}{\sqrt{x^2+a^2}} = \ln (x + \sqrt{x^2+a^2}) + c$$

$$[\text{arctg } x]' = \frac{1}{1+x^2} \quad [\text{arccotg } x]' = -\frac{1}{1+x^2} \quad \int \frac{dx}{x^2+a^2} = \frac{1}{a} \text{arctg } \frac{x}{a} + c_1 = -\frac{1}{a} \text{arccotg } \frac{x}{a} + c_2$$

$$\int \frac{dx}{x^2-a^2} = \int \frac{1}{2a} \left[\frac{1}{x-a} - \frac{1}{x+a} \right] dx = \frac{1}{2a} \ln \left| \frac{x-a}{x+a} \right| + c \quad a^2 - b^2 = (a-b)(a+b)$$

$$a^n - b^n = (a-b)(a^{n-1} + a^{n-2}b + \dots + ab^{n-2} + b^{n-1}) \quad a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

$$1 - g^n = (1-g)(1+g+g^2+\dots+g^{n-1}) \quad 1 - q^3 = (1-q)(1+q+q^2)$$