DERIVACE

$$e^x, \quad \sin x, \quad \ln x, \quad \arcsin \frac{2x}{x^2+1}.$$

$$G(x) = (f(x)-f(a))(\varphi(b)-\varphi(a)) - (\varphi(x)-\varphi(a))(f(b)-f(a)) \quad \text{(+Rolleova věta)}$$

$$F(t) = f(x) - f(t) - f'(t)(x-t) - \frac{f''(t)}{2!}(x-t)^2 \ldots - \frac{f^{(k)}(t)}{k!}(x-t)^k \quad (+\varphi(t) = (x-t)^{k+1})$$

LIMITY FUNKCÍ - TĚŽŠÍ

$$\lim_{x\to 0} \frac{e^x \sin x - x(1+x)}{x^3}, \quad \lim_{x\to 0}\left(\frac{1}{x} - \frac{1}{\sin x}\right), \quad \lim_{x\to 0} \frac{\cos x - e^{-\frac{x^2}{2}}}{x^4}, \quad \lim_{x\to 0} \frac{\sinh(\tan x) - x}{x^3},$$

$$\lim_{x\to 0} \frac{\sin(\sin x) - x\sqrt[3]{1-x^2}}{x^5}, \quad \lim_{x\to 0} \frac{\ln(1+x+x^2)}{\cos x - e^x - \ln(1+x)}, \quad \lim_{x\to 0_+} \frac{a^x - a^{\sin x}}{x^3},$$

$$\lim_{x\to 0} \frac{\ln(1+x) - x}{x^2}, \quad \lim_{x\to\infty} x\left(\left(1+\tfrac{1}{x}\right)^x - e\right), \quad \lim_{x\to\infty} x\left(\frac{\pi}{4} - \arctan\frac{x}{x+1}\right), \quad \lim_{x\to 0_+} x^x,$$

$$\lim_{x\to 0_+} x^{x^x}, \quad \lim_{x\to\infty}\left(\frac{\pi}{2\arctan x}\right)^x, \quad \lim_{x\to 0} \frac{e^{x^2+x^3} - \frac{1}{1-x} + x\sqrt{1+x^3}}{x^6}, \quad \lim_{x\to 1}(2-x)^{\tan\frac{\pi x}{2}},$$

$$\lim_{x\to 0} \frac{e^{\sin^2 x} - 1 - \sin^2 x}{x^4}, \quad \lim_{x\to\frac{\pi}{4}} \frac{\sqrt[3]{\tan x - 1}}{2\sin^2 x - 1}, \quad \lim_{x\to\infty} \frac{\arctan x\left(\sqrt{\frac{x^2+2}{x^2}} - e^{\frac{1}{x^2}}\right)}{x^2(\ln(1+x^3) - \sin(\frac{1}{x^3}) - \ln(x^3))}.$$

Rozvoje: $e^x, \quad \sin x, \quad \cos x, \quad (1+x)^m, \quad \ln(1+x), \quad \ln\left(\frac{1+x}{1-x}\right), \quad \arctan x,$

$e^{2x}, \quad \sin x^2, \quad x^{\frac{5}{2}}, \quad \tan x$ (do pátého řádu).

PRŮBĚH FUNKCE

$$3x^2 - 2x + 4, \quad \frac{x^2-1}{x^2+1}, \quad \frac{2x}{x^2+1}, \quad \ln(|x| - x^2), \quad \frac{x}{\ln x}.$$