

DERIVACE FUNKCE (Podobek):

1. a) $f(x) = x \cdot e^x \cdot \sin x$

$$f'(x) = (e^x + x e^x) \sin x + x e^x \cos x =$$

$$= e^x (\sin x + x (\sin x + \cos x))$$

b) $f(x) = \frac{\operatorname{arctg} x}{\log x}$

$$f'(x) = \frac{\frac{1}{1+x^2} \cdot \log x - \operatorname{arctg} x \cdot \frac{1}{x \cdot \ln 10}}{\log^2 x} =$$

$$= \frac{1}{(1+x^2) \log x} - \frac{\operatorname{arctg} x}{x \cdot \log^2 x \cdot \ln 10}$$

c) $f(x) = 2 \cdot \arcsin^2(\sqrt{2x-1})$, $x \in \langle \frac{1}{2}, 1 \rangle$

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

$$= \frac{4 \cdot \arcsin \sqrt{2x-1}}{\sqrt{2-2x} \cdot \sqrt{2x-1}}$$

d) $f(x) = \left(\frac{1+x}{1-x}\right)^{\left(\frac{1-x}{1+x}\right)}$ $De = (-1, 1) \checkmark$

$$\sim e^{\left(\frac{1-x}{1+x}\right) \cdot \ln\left(\frac{1+x}{1-x}\right)}$$

$$f'(x) = \dots$$