

TAYLORŮV POLYNOM

1. Najděte Taylorův polynom o středu 0 stupně n pro

(a) $f(x) = \operatorname{tg} x$, ($n = 5$)

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

(c) $f(x) = \operatorname{arcsin} x$

(d) $f(x) = \sinh x$

(e) $f(x) = \cosh x$

2. Pomocí Taylorova polynomu spočtěte:

(a)
$$\lim_{x \rightarrow 0} \frac{e^x - \sin x - 1}{x^2}$$

(g)

$$\lim_{x \rightarrow 0} \frac{\sqrt{\cos x} - 1}{\operatorname{arcsin}^2 x}$$

(b)
$$\lim_{x \rightarrow 0} \frac{(e^{x^2} - 1)(\sin x - x)^2}{(\cos x - 1)^2 \sin^4 x}$$

(h)

$$\lim_{x \rightarrow 0} \frac{\ln(\cos x)}{x}$$

(c)
$$\lim_{x \rightarrow 0} \frac{e^x - e^{\sin x}}{x^3}$$

(i)

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{1+x} - \sqrt[5]{1-x}}{\sqrt[5]{1+x} - \sqrt[3]{1-x}}$$

(d)
$$\lim_{x \rightarrow 0} \frac{\cos x - e^{-x^2/2}}{x^4}$$

(j)

$$\lim_{x \rightarrow 0} \frac{\operatorname{tg} x - x}{x - \sin x}$$

(e)
$$\lim_{x \rightarrow 0^+} \frac{\cos x - \cosh x}{x^3}$$

(k)

$$\lim_{x \rightarrow 0} \frac{\sqrt[3]{1+3x} - \sqrt[4]{1+4x}}{\cos ax - \cos bx}$$

(f)
$$\lim_{x \rightarrow 0} \frac{\sqrt{1+x^2} - \sqrt[3]{1-x^2}}{x^2}$$

(l)

$$\lim_{x \rightarrow 0} \frac{\sqrt{1+\operatorname{tg} x} - \sqrt{1+\sin x}}{x^3}$$