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) $f(x) = \arcsin x$

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

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

2. Pomocí Talorova polynomu spočtěte:

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

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

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

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

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

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

   (g)
   $$\lim_{x\to 0} \frac{\sqrt{\cos x} - 1}{\arcsin^2 x}$$

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

   (i)
   $$\lim_{x\to 0} \frac{\sqrt[3]{1+x} - \sqrt[5]{1-x}}{\sqrt[5]{1+x} - \sqrt[3]{1-x}}$$

   (j)
   $$\lim_{x\to 0} \frac{\operatorname{tg} x - x}{x - \sin x}$$

   (k)
   $$\lim_{x\to 0} \frac{\sqrt[3]{1+3x} - \sqrt[4]{1+4x}}{\cos ax - \cos bx}$$

   (l)
   $$\lim_{x\to 0} \frac{\sqrt{1+\operatorname{tg} x} - \sqrt{1+\sin x}}{x^3}$$