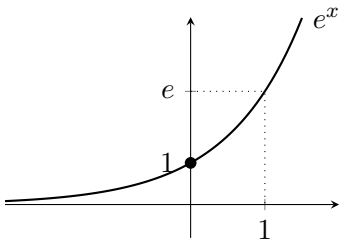
Z grafu funkce určete limity

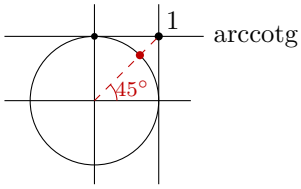
a) $\lim\limits_{x\to\infty} e^x = \boxed{\infty}$ $\quad \lim\limits_{x\to-\infty} e^x = \boxed{0}$ $\quad \lim\limits_{x\to 0} e^x = \boxed{1}$ $\quad \left(\lim\limits_{x\to 1} e^x = \boxed{e}\right)$ lze počítat i dosazením

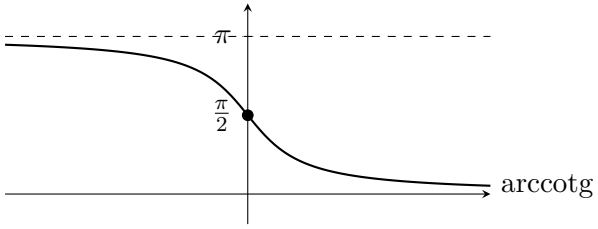


b) $\lim\limits_{x\to\infty} \operatorname{arccotg} x = \boxed{0}$ $\quad \lim\limits_{x\to-\infty} \operatorname{arccotg} x = \boxed{\pi}$

$\left(\lim\limits_{x\to 1} \operatorname{arccotg} x = \operatorname{arccotg} 1 = 45° = \frac{\pi}{4}\right)$

určíme
z jednotkové kružnice





Vypočti:

a) $\lim\limits_{x\to\infty} e^{\frac{2x}{x^2-1}} = e^{\lim\limits_{x\to\infty} \frac{2x}{x^2-1}} = e^{\lim\limits_{x\to\infty} \frac{2x}{x^2}} = e^{\lim\limits_{x\to\infty} \frac{2}{x}} = e^0 = \boxed{1}$

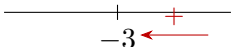
b) $\lim\limits_{x\to\infty} \dfrac{3x^4 - 2}{2x^4 + x - 3} = \lim\limits_{x\to\infty} \dfrac{3x^4}{2x^4} = \boxed{\dfrac{3}{2}}$

c)

$$\lim_{x\to-3^+} \frac{2-x}{2x^2+5x-3} = \left[\frac{5}{0}\right] = \lim_{x\to-3^+} \frac{2-x}{2(x+3)\left(x-\frac{1}{2}\right)} = \lim_{x\to-3^+} \frac{1}{x+3} \cdot \lim_{x\to-3^+} \frac{2-x}{2\left(x-\frac{1}{2}\right)} =$$

$D = 25 - 4\cdot 2\cdot(-3) = 49$

$$x_{1,2} = \frac{-5 \pm \sqrt{49}}{4} = \frac{-5\pm 7}{4} = \begin{cases} -3 \\ \frac{2}{4} = \frac{1}{2} \end{cases}$$



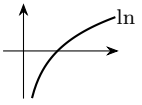
$(x+3) > 0$

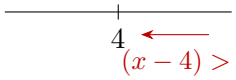
$$= \frac{1}{0^+} \cdot \frac{5}{2\left(-3-\frac{1}{2}\right)} = \infty \cdot \frac{5}{2\cdot\left(-\frac{7}{2}\right)} = \infty \cdot \left(-\frac{5}{7}\right) = \boxed{-\infty}$$

d)

$$\lim_{x\to4^+} \ln \frac{3x+1}{x^2-4x} = \ln \lim_{x\to4^+} \frac{3x+1}{x^2-4x} = \ln \lim_{x\to4^+} \frac{3x+1}{x(x-4)} = \ln\left(\lim_{x\to4^+} \frac{1}{x-4} \cdot \lim_{x\to4^+} \frac{3x+1}{x}\right) =$$

$$= \ln\left(\frac{1}{0^+} \cdot \frac{3\cdot 4+1}{4}\right) = \ln\left(\infty \cdot \frac{13}{4}\right) = \ln\infty = \boxed{\infty}$$





$(x-4) > 0$

e) $\lim\limits_{x\to-\infty} \left(x^3 - x + 2\right) = (-\infty)^3 = \boxed{-\infty}$