$$\cancel{(x^x)' = x\cdot\left(x^{x-1}\right)}.$$

$$\|$$

$$\left(e^{x\cdot \ln x}\right)' = e^{x\cdot \ln x}\cdot\left(x\cdot \ln x\right)' = \dots$$

$$e = \lim_{n\to\infty} \underbrace{\left(1+\frac{1}{n}\right)^n}_{a_n} \qquad e^x = ?$$

"tato funkce je v matematice nejdůl.:"

$$e^x = \underbrace{1 + x + \frac{1}{2!}x^2 + \frac{1}{3!}x^3 + \dots + \frac{1}{k!}x^k + \dots}_{\sim T_k(x)}$$

$$e = \lim_{n\to\infty} \underbrace{\left(1+\frac{x}{n}\right)^{\frac{n}{x}}}_{b_n} \qquad x \in \mathbb{R} \text{ pevné}$$

$$(b_n)^x \xrightarrow[n\to\infty]{} e^x$$

$$\sum_{j=0}^{k} q^j = \frac{1-q^{k+1}}{1-q} \begin{cases} \nearrow \ \infty & q > 1 \\ \searrow \ \dfrac{1}{1-q} & |q| < 1 \end{cases}$$

$a_n = (-1)^n$ $\qquad \sum a_n$ nemá limitu

$b_n = (-1)^{n+1}$ $\qquad \sum b_n$ " " –

posloupnost $c_n \in \mathbb{R}$

$$\inf_{n\geq 0}\sup_{k\geq n} c_k = \inf\{\sup\{c_k : k\geq n\} : n\geq 0\}$$

$f_n(x)$, $f_n : \mathbb{R} \to \begin{matrix}\mathbb{R}\\ \mathbb{C}\end{matrix}$

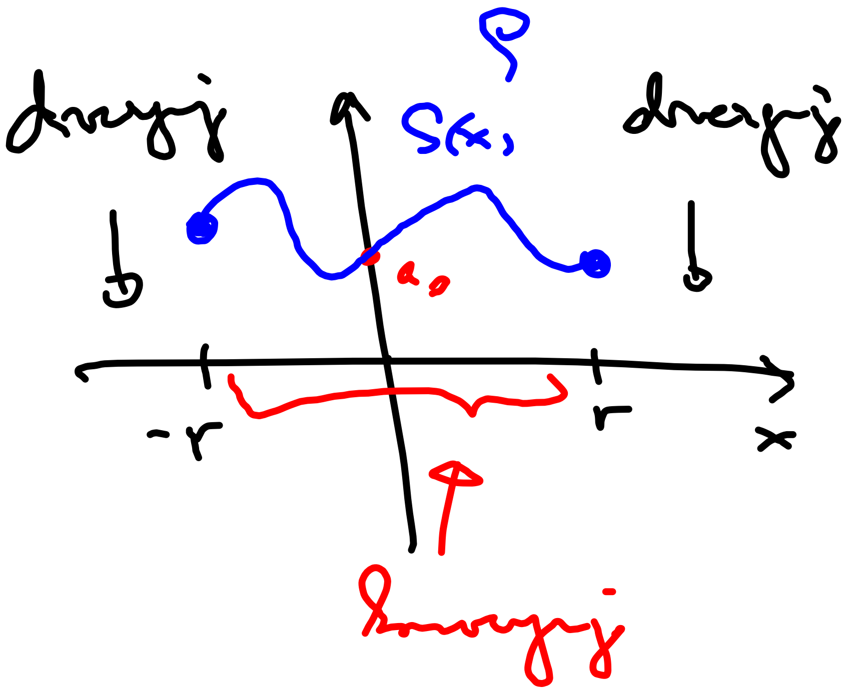
$$S(x) = \sum_{n=0}^{\infty} f_n(x) \qquad S : \mathbb{R} \to \begin{matrix}\mathbb{R}\\ \mathbb{C}\end{matrix}$$

řada funkcí

$$c_n = a_n x^n$$

$$\lim_{n\to\infty} \sqrt[n]{c_n} = \lim_{n\to\infty} \sqrt[n]{a_n} \cdot x = x \lim_{n\to\infty} \sqrt[n]{a_n}$$

$$S = \sum_{n=0}^{\infty} a_n x^n$$



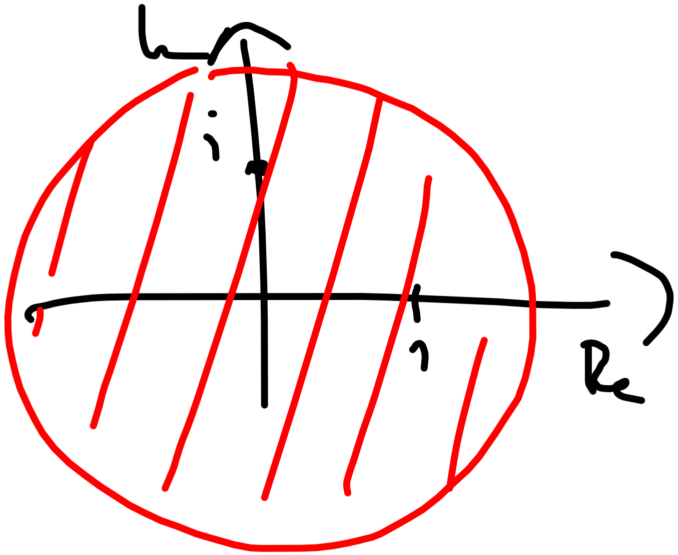
$$e^x: \quad a_n = \frac{1}{n!}$$

$$\sqrt[n]{\frac{1}{n!}} \longrightarrow 0$$

$$e^x = 1 + x + \frac{1}{2}x^2 + \dots + \frac{1}{k!}x^k + \dots$$

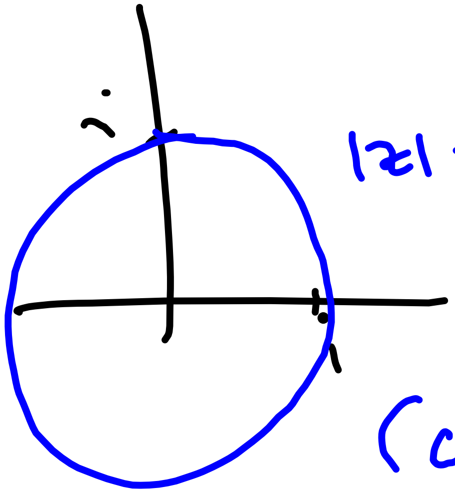
$$S(x) = a_0 + a_1 x + \dots$$

$$= \mathrm{Re}\, S(x) + \mathrm{Im}\, S(x)$$



$\mathbb{C}$

$$e^{x+y} = e^x \cdot e^y \quad \text{atd}$$



$|z| = 1$

$$|e^{it}| = 1$$

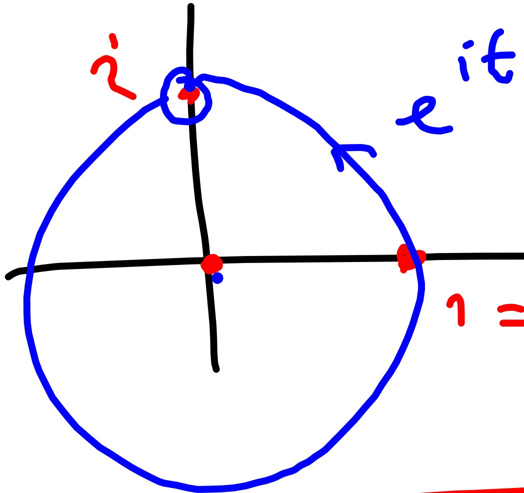
$$e^{it} = \cos t + i \sin t$$

$$(\cos t + i \sin t)' = (\cos t)' + i(\sin t)' =$$

$$i \cdot e^{it} = \left(1 + it - \frac{1}{2} t^2 - i \frac{1}{3!} t^3 + \dots\right) \cdot i$$

$$= \left(i - t - i\frac{1}{2} t^2 + \frac{1}{3!} t^3 + \dots\right)$$

$i \cos t \qquad -\sin t$



$1 = e^{0t} = \cos 0$

$t = 0$

$e^{-it_0} = -e^{it_0}$

$\Downarrow$

$e^{it_0} = i$

$\Rightarrow \boxed{t_0 = \frac{1}{2}\pi}$

$$(\sin 2t)' = \cos 2t \cdot 2$$

$$\cosh t = \frac{1}{2}\left(e^{t} + e^{-t}\right)$$

$$\sinh t = \frac{1}{2}\left(e^{t} - e^{-t}\right)$$