$$f(x)=\frac{x}{\sqrt{1+x^2}},(\underbrace{f\circ f\circ\cdots\circ f}_{n})(x),$$

$$f(f(x))=\frac{f(x)}{\sqrt{1+f(x)^2}}=\frac{\frac{x}{\sqrt{1+x^2}}}{\sqrt{1+\frac{x^2}{1+x^2}}}=\frac{x}{\sqrt{1+x^2+1+x^2}}=\frac{x}{\sqrt{1+2x^2}}f(f(f(x))=\frac{x}{\sqrt{1+3x^2}}$$

$$f:\mathbb{R}\to\mathbb{R},f\circ f=\mathbb{I}$$

$$\frac{f(x)}{x}\implies\frac{f(x_1+x_2)}{x_1+x_2}\leq\frac{f(x_1)}{x_1}\leq\frac{f(x_2)}{x_2}$$

$$\lim_{n\to\infty}\sqrt[n]{[a\,[a\,[\cdots[a\,[a]]\cdots]]]}$$

$$\lim_{n\to\infty}\left(\frac{1}{\sqrt{n^2+1}}+\frac{1}{\sqrt{n^2+2}}+\cdots+\frac{1}{\sqrt{n^2+n}}\right)$$

$$\lim_{n\to\infty}\left(\frac{1}{\sqrt{n^2+1}}+\frac{1}{\sqrt{n^2+2}}+\cdots+\frac{1}{\sqrt{n^2+n}}\right)$$

$$x_n=sin1+\frac{\sin 2}{2!}+\frac{\sin 3}{3!}+\cdots+\frac{\sin n}{n!}\forall n\in\mathbb{N},n>0,n!\geq n(n-1)\implies\frac{1}{n!}\leq\frac{1}{n(n-1)}=\frac{1}{n-1}-\frac{1}{n}|x_n|$$

$$\lim_{n\to\infty}a_n=a,\lim_{n\to\infty}b_n=b,\lim_{n\to\infty}\frac{\sum_{i=1}^{n}a_ib_i}{n}$$

$$\frac{|x_{n+1}-x_n|}{|x_n-x_{n-1}|}$$

$$\lim_{n\to\infty}\frac{\sqrt[n]{n!}}{n}=\frac{1}{e}$$