Taylore-Entwicklung für den natürlichen Logarithmus

$$\ln(1-z) \xrightarrow{series} -z-\frac{z^2}{2}-\frac{z^3}{3}-\frac{z^4}{4}-\frac{z^5}{5}-\frac{z^6}{6}$$

$$\ln(1+z) \xrightarrow{series} z-\frac{z^2}{2}+\frac{z^3}{3}-\frac{z^4}{4}+\frac{z^5}{5}-\frac{z^6}{6}$$

$$\ln\left(\frac{1+z}{1-z}\right) \xrightarrow{series} 2\cdot z+\frac{2\cdot z^3}{3}+\frac{2\cdot z^5}{5}$$

$$ln\left(\frac{1+z}{1-z}\right)=\left(ln(1+z)-ln(1+z)\right)=2\cdot z+\frac{2\cdot z^3}{3}+\frac{2\cdot z^5}{5}$$

$$x=\frac{1+z}{1-z} \qquad z=\frac{x-1}{x+1}$$

$$ln\left(\frac{1+z}{1-z}\right)=ln(x)=2\cdot z+\frac{2\cdot z^3}{3}+\frac{2\cdot z^5}{5}=2\cdot\left(\frac{x-1}{x+1}\right)+\frac{2\cdot\left(\frac{x-1}{x+1}\right)^3}{3}+\frac{2\cdot\left(\frac{x-1}{x+1}\right)^5}{5}$$

$$ln(x)=2\left(\left(\frac{x-1}{x+1}\right)+\frac{1}{3}\cdot\left(\frac{x-1}{x+1}\right)^3+\frac{1}{5}\cdot\left(\frac{x-1}{x+1}\right)^5\right)=2\cdot\sum_{k=1}^{n}\frac{1}{2\cdot k-1}\cdot\left(\frac{x-1}{x+1}\right)^{2\cdot k-1}$$