D2877

$$\frac{x-1}{x+1} = t \sim x-1 = tx+t \sim x(1-t) = 1+t \sim$$

$$\sim x = \frac{1+t}{1-t}$$

$$\ln\frac{1+t}{1-t} = \ln(1+t) - \ln(1-t) \overset{(*)}{=} 2\sum_{n=0}^{\infty} \frac{t^{2n+1}}{2n+1} =$$

$$= 2\sum_{n=0}^{\infty} \frac{1}{2n+1}\left(\frac{x-1}{x+1}\right)^{2n+1}$$

kde (*): $|t|<1 \sim \left|\frac{x-1}{x+1}\right| < 1$ je pravda pre $x>0$

takže:

$$\boxed{\forall x>0 : \ln x = 2\sum_{n=0}^{\infty} \frac{1}{2n+1}\left(\frac{x-1}{x+1}\right)^{2n+1}}$$