147

$$\lim_{x\to+\infty} \frac{\operatorname{senh} x + \operatorname{arctg} x}{\log^2 x - 3\log x + 1}\left(\sqrt[5]{\frac{\log^2 x + \operatorname{senh} x + 1}{\operatorname{senh} x - 2\cos x + 3}} - 1\right)$$

$$\left\{\frac{\log^2 x + \operatorname{senh} x + 1}{\operatorname{senh} x - 2\cos x + 3} = \frac{2\log^2 x + e^x - e^{-x} + 2}{e^x - e^{-x} - 4\cos x + 6} \to 1\right\}$$

$$= \lim_{x\to+\infty} \cancel{\operatorname{senh} x}\,\frac{e^x}{2}\cdot\frac{\left(1 - e^{-2x} + 2e^{-x}\operatorname{arctg} x\right)}{\log^2 x - 3\log x + 1}\left(\sqrt[5]{1 + \frac{\log^2 x + \operatorname{senh} x + 1}{\operatorname{senh} x - 2\cos x + 3} - 1} - 1\right)$$

$$= \lim_{x\to+\infty} \frac{e^x}{2}\,\frac{1 - e^{-2x} + 2e^{-x}\operatorname{arctg} x}{\log^2 x - 3\log x + 1}\left(\sqrt[5]{1 + \frac{\log^2 x + 2\cos x - 2}{\operatorname{senh} x - 2\cos x + 3}} - 1\right) =$$

$$= \lim_{x\to+\infty} \cancel{\frac{e^x}{2}}\,\frac{1 - e^{-2x} + 2e^{-x}\operatorname{arctg} x}{\log^2 x - 3\log x + 1}\cdot\frac{\log^2 x + 2\cos x - 2}{\cancel{\frac{e^x}{2}}\left(1 - e^{-2x} - 4\cos x + 6\right)}\cdot\underbrace{\frac{\sqrt[5]{\cdots} - 1}{\frac{\log^2 x + 2\cos x - 2}{\operatorname{senh} x - 2\cos x + 3}}}_{\downarrow\ \frac{1}{5}}$$

$$= \frac{1}{5}\cancel{\lim_{x\to+\infty}}$$